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The College of Agriculture, Forestry, and Home Economics

Part I

Announcement of Courses for the Years 1928-1930

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CURRICULA

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

FACULTY

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William Watts Folwell, LL.D., President Emeritus
Walter C. Coffey, M.S., LL.D., Dean of the Department of Agriculture
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
Rodney M. West, B.A., Registrar

AGRICULTURAL BIOCHEMISTRY

Professors Ross A. Gortner, Ph.D., Clyde H. Bailey, Ph.D., Leroy S. Palmer, Ph.D.; Associate Professor John J. Willaman, Ph.D.; Assistant Professor Cornelia Kennedy, Ph.D.; Instructors Kurt W. Franke, Ph.D., W. Martin Sandstrom, Ph.D.

AGRICULTURAL ECONOMICS

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AGRICULTURAL EDUCATION

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AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

Professor Andrew Boss, D.Sc.; Associate Professors Albert C. Arny, M.S., George A. Pond, Ph.D., Assistant Professors Harvey E. Brewbaker, Ph.D., Lewis F. Garey, M.A., Frederick J. Stevenson, M.S., Harold K. Wilson, Ph.D.; Instructors Andrew T. Hoverstad, B.S., J. Wesley Nelson, B.S. in Agr.; 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.; Assistant Professors Philip A. Anderson, B.S. in Agr., Mark A. McCarty, M.S.; Instructor Alfred L. Harvey, M.S.; Extension Specialists William E. Morris, B.S., Henry G. Zavoral, B.S.A.

BEE CULTURE

Instructor James W. Thompson, B.S.

DAIRY HUSBANDRY

Professors Clarence H. Eckles, D.Sc., Willis B. Combs, M.A.; Professor Emeritus Theophilus L. Haecker; Assistant Professor Harold Macy, B.S.; Instructor Lloyd M. Thurston, B.S.; Assistants Samuel T. Coulter, B.S., Harold B. Richie, B.S.; Extension Specialists Raymond L. Donovan, B.S., Charles C. Geddes, Edwin A. Hanson, B.S. in Agr., Harold R. Searles, B.S. in Agr.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Royal N. Chapman, Ph.D., William A. Riley, Ph.D., Arthur G. Ruggles, M.A.; Associate Professor Robert A. Wardle, M.S.; Assistant Professors Maynard S. Johnson, Ph.D., Clarence E. Mickel, Ph.D., August L. Strand, M.A.

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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 Professors Randolph M. Brown, M.F.; Thorwald S. Hansen, B.S., M.F., Louis W. Rees, B.S.

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., Frances Dunning, M.S., Jane M. Leichsenring, Ph.D., Katharine McFarland, M.A., Amy P. Morse, B.A., Ethel L. Phelps, Ph.D., Lucy A. Studley, M.A.; Instructors Monica J. Aamodt, B.S., Carlotta M. Brown, Beatrice Counts, M.S., Sparkle V. Furnas, B.S., Vetta Goldstein, Ethel R. Gorham, M.A., Hope H. Hunt, M.S., Fanny J. Kendall, Agnes Kolshorn, M.A., Caroline Little, M.A., Kathryn B. Niles, B.S., I. Irene Sell, M.S., Helen J. Topp, B.S., Julia B. Whiteside, B.S.

HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal, M.A.; Associate Professors Clara M. Brown, M.A., Harriet I. Goldstein; Assistant Professor Ella J. Rose, M.S.; Instructors Monica J. Aamodt, B.S., Lola M. Cremeans, M.S., Laura B. Hadley, B.S., Hedda Kafka, B.S., I. Irene Sell, M.S., Helen J. Topp, B.S.

HORTICULTURE

Professor William H. Alderman, B.S.A.; Associate Professor Wilfred G. Brierley, M.S.; Assistant Professors Clarence E. Cary, B.S. in Agr., Fred A. Krantz, Ph.D.; Instructors Hamilton D. Traub, Ph.D., 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 Ray C. Hill, Major, Infantry, Frederick S. Matthews, Captain, Infantry, Don F. Pratt, Captain, Infantry, Porter P. Wiggins, Captain, Infantry, Julian H. Gist, Captain, Infantry, William G. Walker, Captain, Infantry, Murray T. Davenport, Captain, Infantry; Instructors, Alfred Brandt, Master Sergeant, Infantry, John Coop, Sergeant, Infantry.

PHYSICAL EDUCATION FOR MEN

Associate Professors Louis J. Cooke, M.D., Louis F. Keller, M.A.

PHYSICAL EDUCATION FOR WOMEN

Professor J. Anna Norris, M.D.; Assistant Professors Gertrude M. Baker, B.A., Alice J. H. Tolg, M.D.; Instructors Else Bockstruck, B.S., Mary S. Conger, Grace E. Denny, B.S., 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., Alvin H. Larson, B.S. in Agr., Julian G. Leach, Ph.D.; Instructors Louise Dosdall, Ph.D., Ralph Lindgren, B.S., Paul D. Peterson, M.S., Herman A. Rodenhiser, M.S.; Extension Specialist Raymond C. Rose, M.S.

POULTRY HUSBANDRY

Professor Arthur C. Smith, B.S.; Instructor Alvie A. Hoberg, B.S., Extension Specialist 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., William J. Miller M.A.; Instructors Wilbur S. Furlow, M.A., Mabel D. Hessler, M.A.

SOILS

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

VETERINARY MEDICINE

Professors Clifford P. Fitch, M.S., D.V.M., Willard L. Boyd, D.V.S., Myron H. Reynolds, B.S., D.V.M., M.D.; Associate Professor Howard C. H. Kernkamp, D.V.M.; Assistant Professor Earl A. Hewitt, B.A., B.S., D.V.M.

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

ARCHITECTURE

Instructor Elmer E. Young.

ART EDUCATION

Professor Ruth Raymond, M.A.; Assistant Professor Robert S. Hilpert, B.S.; Instructors Cornelia Clousing, B.S., Leah M. Hanley, B.S.

BACTERIOLOGY AND IMMUNOLOGY

Professor Winford P. Larson, M.D.; Instructor Charles E. Skinner, Ph.D.

BOTANY

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

CHILD WELFARE INSTITUTE

Professor John E. Anderson, Ph.D.; Assistant Professors Edith Boyd, M.D., Josephine C. Foster, Ph.D., Florence L. Goodenough, Ph.D.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

Professorial Lecturer Wesley E. Peik, M.A.

EDUCATIONAL PSYCHOLOGY

Professor Wilford S. Miller, Ph.D.

GEOLOGY AND MINERALOGY

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

HISTORY AND PHILOSOPHY OF EDUCATION

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

INORGANIC CHEMISTRY

Associate Professor Lloyd H. Reyerson, Ph.D.; Assistant Professor Norville C. Pervier, Ph.D.

PHYSIOLOGY

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

PREVENTIVE MEDICINE AND PUBLIC HEALTH

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

PSYCHOLOGY

Professor Richard M. Elliott, Ph.D.

SOCIOLOGY AND SOCIAL WORK

Assistant Professor Gustave A. Lundquist, Ph.D.

ZOOLOGY

Instructor, Ralph W. Dawson, M.A.

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.

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

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

Applicants for admission are urged to present physics (1 unit) and chemistry (1 unit), for entrance 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 correspond as closely as possible with the following suggestions:

Pre-Agriculture and Pre-Forestry Courses in Junior Colleges

Students from accredited junior colleges who have completed the general requirements described below will be admitted to the junior class in the agricultural and forestry courses of the College of Agriculture, Forestry, and Home Economics of the University of Minnesota. The amount of additional time required to complete the work of the college for the degree of bachelor of science will depend (1) upon the quality and quantity of work which such students can do and (2) upon the special

curriculum which they elect. Many of these curricula may be completed in two years by students who maintain at least the average quality and quantity of work. Additional work in summer sessions or regular quarters may be necessary in some of the special curricula. Since a large number of fields of specialization are open to students, and since these curricula vary so greatly in the subject-matter courses required, it is impossible to make any more specific statement. The requirements given below can be satisfied in the average junior college which offers a fundamental arts and science curriculum. Students in some junior colleges can select additional subjects which may be directly applicable and very helpful in the field of specialization to be followed later. Students who have not completely met the requirements will be given proportional credit.

1. A total of 90 credits (1 semester credit = 1.5 quarter credits)
2. Required courses:
   (a) Botany 9-15 cred.; Gen. Chem. 10-15 cred.; Zool. 9-15 cred.; Rhetoric and English 9-15 cred.
   (b) At least two of the following: Mathematics 9-15 cred.; Economics 9-15 cred.; Modern Language 15 cred.
   (c) Electives. Sufficient to bring total credits to minimum of 90 cred.

The following is a general list of electives applicable in one or more of the specialization fields in the College of Agriculture, Forestry, and Home Economics. These subjects are, of course, not equally applicable in all fields. Sociology, psychology, economics, physics, history, advanced mathematics, technical business, and agriculture and engineering subjects, advanced English, public speaking, mechanical drawing, freehand drawing, surveying, qualitative, quantitative, and organic chemistry, advanced courses in zoology and botany, bacteriology, modern language (especially French and German). For prospective forestry students, physics and especially survey are recommended.

Home Economics in Junior Colleges

In planning the work in the junior college with the idea of transferring later to the University of Minnesota the prospective transfer student should keep these facts in mind.

The requirements for a B.S. degree in Home Economics are set down in the catalog for the College of Agriculture, Forestry, and Home Economics on page 10.

Physical and biological science courses such as general and inorganic chemistry, bacteriology, biology, and physiology are required. A student may receive exemption from physics if she has had one year of physics in high school.

Color and design, textiles, clothing, and foods courses are required in the freshman and sophomore years.

English including public speaking, psychology, and sociology are junior college requirements.

The student transferring to the University of Minnesota, Home Economics Division, may expect to receive credit for such courses as listed

above and elective credits for courses not listed. The complete junior college record should be sent to the chairman of the Enrolment Committee for the College of Agriculture, Forestry, and Home Economics at University Farm, St. Paul, for evaluation before the student enters.

PSYCHOLOGICAL EXAMINATION

All new students are required to take a psychological examination on entrance as a part of the matriculation procedure. Admission, however, does not depend upon the results of the examination.

EXAMINATION IN ENGLISH COMPOSITION

All freshman students are required to take preliminary tests in English. Those failing to pass the tests will be required to do extra work in composition until their disability is removed. Students who desire to do so may take further examinations in rhetoric, the passing of which will exempt them from registering for part or all of the courses in freshman rhetoric.

PLACEMENT TESTS

The College of Agriculture, Forestry, and Home Economics desires to bring about the best correlation possible between the technical courses in the fields of agriculture, forestry, and home economics, as taught in the schools of agriculture, in the high schools, and in other institutions. Where students have taken considerable work in these technical courses, it may be desirable for them not to be required to repeat a part or all of this work in the elementary courses in the college. The amount of work taken in the preparatory school and the quality of that work, and, finally, the question as to whether or not the subject-matter course has been used for entrance to the University, must be taken into consideration. In general, two possibilities for placement tests are offered:

1. For subjects not used for entrance to the University and in which the student has had adequate training, examinations may be taken for full credit in the elementary technical course in the college. These examinations may be taken during the first six weeks of residence without fee. After that time, a five-dollar fee is required.

2. For subjects which the student has used for entrance to the University, the student may, by satisfactory examination or by the presentation of other satisfactory evidence, be given permission to omit the elementary subject in the college course, substituting therefor credits in other subjects and taking immediately the more advanced courses in this field.

FEES

Tuition fee, per quarter	
Residents of Minnesota	$20.00
Non-residents	30.00
Credit hour tuition fee (for students registered for less than full work)	
Residents of Minnesota	1.50
Non-residents	2.25
Students in Agricultural Business Administration will pay the fees of the School of Business Administration in their junior and senior years.	
Incidental fee, per quarter	6.00
Military deposit (for all students registered for military drill)	10.00

Deposit (first quarter only)	5.00
Special fees	
Itasca Park tuition (freshmen and juniors in forestry) prorated on basis of regular quarter tuition per quarter of 12 weeks	20.00
Physical Training for Men, per quarter course	1.50
Physical Training for Women	
First year courses, per quarter	2.50
Other courses, per quarter	2.00
Maximum fee per quarter, $3.50	
Vocal or instrumental music see general information bulletin for special fees	
Practice teaching laboratory, per credit hour	1.00
Examination for removal of condition	1.00
Examination for credit (after the first six weeks in residence)	5.00
Special examination	5.00
Change of registration	2.00
Graduation fee	10.00

Late registration.—Old students must indicate their registration and pay their fees not later than two weeks before the day set for classes to begin. New students must complete their registration (including payment of fees) before the day set for classes to begin. The penalty for delay in either indicating or completing registration is two dollars. An additional dollar is charged for each day of delay after the last day set for the completion of registration and a similar charge is made for each day of delay after the last day set for payment of fees.

Important.—The regulations require that no student be allowed to register after the quarter opens except by special committee action.

FACULTY REGULATIONS

Students are held responsible for compliance with all faculty regulations. These regulations are published in a booklet issued to students at the time of registration.

REQUIREMENTS FOR GRADUATION AND DEGREES

After the completion of the prescribed curriculum including all of the required work and the requisite amount of elective work to make the total given below, candidates will be recommended for graduation with the degree indicated.

The number of free elective credits required for graduation will be decreased by one for each five honor points in excess of one honor point per credit. This provision does not apply to candidates in the professional curriculum in Agricultural Engineering.

Course of Study	Credit Requirement	Honor Point Requirement	Degree Conferred
Technical Agricultural courses	204	204	Bachelor of science
Agricultural Science courses	192	192	Bachelor of science
Forestry courses	204	204	Bachelor of science
Home Economics courses	189	189	Bachelor of science
Agricultural Engineering (professional course)	210	None	Bachelor of agricultural engineering
Agricultural Business Administration	192	192	Bachelor of business administration in agriculture
Agricultural Journalism	192	192	Bachelor of science

Degrees with distinction.—The degree of bachelor of science with distinction is granted to graduates of this college who have attained excellence

in scholarship as evidenced by an average grade of "B" for the entire four-year curriculum. Transfer students with less than two years of work in this college shall not be eligible. Recommendations to the faculty for the degree with distinction shall be made through the Students' Work Committee on the basis of scholarship and other evidence of satisfactory achievement and advancement in the courses pursued.

Degrees with high distinction.—The degree of bachelor of science with high distinction is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average of two and one-half honor points per credit for the entire curriculum. The same conditions for residence and recommendation apply as for the degree with distinction.

GRADING SYSTEM AND HONOR POINTS

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

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

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. Applications should be sent to the director of Sanford Hall, University of Minnesota.

Private houses.—For information concerning approved boarding and rooming houses, address The Housing Bureau, University of Minnesota, Minneapolis.

STUDENTS' BOOKSTORE

The University owns and operates a bookstore for the convenience of students and faculty. Books and supplies are handled on a profit sharing basis, rebate checks being given on all purchases with the exception of candy, special bulletins, class material, and books obtained on individual orders.

CURRICULA

AGRICULTURE

(See pages 15 to 31)

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

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

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

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

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

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

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

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

C. Agricultural Engineering Professional Curriculum. The professional curriculum in Agricultural Engineering is offered jointly with the College of Engineering and Architecture. In addition to the outlined curriculum, electives may be selected in order to major in one of the following fields of work:

1. Farm Buildings
2. Farm Machinery
3. Reclamation

[1] Offered jointly with the College of Education.

D. Agricultural Business Administration Curriculum. Students desiring to prepare for admission to the School of Business Administration may complete the Agriculture-Pre-Business Curriculum in the College of Agriculture, Forestry, and Home Economics. The work of the junior and senior years, is offered jointly with the School of Business Administration.

E. Agricultural Journalism. This curriculum is offered jointly with the College of Science, Literature, and the Arts.

FORESTRY

(See pages 32 to 36)

The curriculum in Forestry provides an opportunity in the junior and senior years to major in one of the following fields:

1. General Forestry
2. Commercial Lumbering
3. Forest By-Products
4. Grazing
5. Forest Sciences

HOME ECONOMICS

(See pages 37 to 45)

In home economics opportunity is provided in the junior and senior years to major in one of the following outlined curricula:

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

The following teacher's curricula are also offered jointly with the College of Education:

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

EXPLANATION OF TERMS AND COURSE NUMBERS

The quarters in which courses are offered are indicated by the letters f (fall), w (winter), s (spring), and su (summer) following the course number. For example: 5f,w,s indicates that Course 5 is given in the fall quarter and is repeated in the winter and again in the spring quarter; 5f-6w indicates a two-quarter course extending through the fall and winter quarters; and 5f,w-6w,s, indicates that Course 5-6 is given in the fall and winter quarters and repeated through the winter and spring quarters.

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

Numbers following the descriptive name of a course indicate the number of credit hours.

Course numbers in parentheses, following the number of credit hours, indicate prerequisite courses.

Descriptions of the courses listed in the following outline of the curricula, together with those of additional courses offered as electives, will be found on pages 46 to 80. The program of classes is printed in Part II. The divisional statements are arranged alphabetically according to the names of the divisions.

One *credit hour* is equivalent to (1) one lecture or recitation period requiring two hours of preparation, (2) two periods of laboratory work requiring one hour of preparation, or (3) three periods of laboratory work with no preparation, each week for one quarter.

Honor points.—See page 11 for definition.

A *major* is a series of courses equivalent to from 24 to 36 credit hours chosen from one of the elective groups.

A *minor* is a series of courses equivalent to 18 credit hours chosen from one of the elective groups.

A *required* course is a course required of all students for graduation, irrespective of their major sequence.

A *limited elective* course is an elective which may not be chosen from the same group as the major or minor.

A *free elective* course may be chosen from any courses offered in the University for which the student has completed the prerequisites.

REGISTRATION

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

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

Elective courses in the College of Science, Literature, and the Arts are separated into junior college courses (numbered 1 to 49) open to freshmen and sophomores, and senior college courses (numbered 50 to 199) open to juniors and seniors. In addition to satisfying other prerequisites a minimum of 90 credits and 90 honor points must be earned before registering for a senior college elective.

CURRICULA IN AGRICULTURE

A. TECHNICAL AGRICULTURAL CURRICULUM

This curriculum requires 204 credit hours for graduation and is made up of (1) required courses which every student must complete and (2) elective courses distributed according to several methods described below (pages 17 to 25).

Required Courses[1]

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

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 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 special corrective exercises in physical education.

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[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 curriculum 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.

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. 13f,s, Gas Engines, 3; Agr. Eng. 28w, Land Clearing, 3; Agr. Eng. 31,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 outlined curricula. If completed in meeting this requirement some other of the above courses must be submitted in the junior or senior year.

Agr. Eng. 9f,w-10w,s, or 11f,w, Applied Mathematics, 5. Students found unable to pursue Course 11 to advantage will be transferred to Course 9-10 which covers the same work and carries the same credit but is extended through two quarters with additional scheduled time for class exercises. Not required of those who complete Math. 5 or 8.

[1]Agron. 1f,w,s, General Farm Crops, 3

[1]An. Husb. 10f-11w, Types and Market Classes of Livestock, 6

not offered

Bot. 1f,s, General Botany, 4 and 6 credits selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22.

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

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

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

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

Math. 5f,w,s, Higher Algebra, 5 (1 yr. Elem. Algebra) or Math. 8f,w,s, Commerce Algebra, 5 (Math. 5 or h. s. higher algebra). Not required of those who complete Agr. Eng. 9-10 or 11.

[2]Rhet. 1f,w,s, Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 204 credit hours.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *Freshman courses* which were not completed during the freshman year.

3. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.

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

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

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

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

Agr. Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their curriculum.

Bact. 41f,w,s, General Bacteriology, 5 (Chem., zool.)

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

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

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

[2] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

[3] Students who expect to major in Agricultural Education may substitute 10 credits elective for this course with the approval of the chief of the Division of Agricultural Education.

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)
Zool. 14f-15w-16s, General Zoology, 9

Elective Courses

Elective courses may be distributed according to one of the following methods: I (below) or II (page 18). Every student is required to file in the registrar's office by the end of his sophomore year a statement of the curriculum which he plans to pursue during his junior and senior years. Such statements from each student will make it possible to provide a workable program of subject courses. The student may make, and is strongly advised to make, this statement at the end of his freshman year. In this case he would have ample opportunity to change his curriculum at the end of the sophomore year. A change from one curriculum to another after the close of the sophomore year is permitted only on approval and does not exempt the student from any of the requirements of the curriculum which he finally selects. Such changes usually involve inconvenience and sometimes loss of credit to the student. All students are invited to consult with the dean of the college concerning the selection of curricula.

Method I—*Open Elective Curricula*

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

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

a. A major of from 24 to 36 credit hours.
b. A minor of 18 credit hours.
c. Limited electives 18 credit hours, which must be selected outside of the groups from which the major and minor have been chosen, and
d. Free electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University.

The major and minor must be selected from different elective groups, except that students whose major is chosen from Group 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

Bact. 103. Soil Microbiology may be accepted in Agric Sc. - Plant Ind. fields without pet.

Memo. Ag Bio 103 by Chem. May be used in either Agr Ind or Ag Science - Pl. Ind. major or minor fields

3. Agricultural Sciences and Plant Industry, including
   - Agricultural Biochemistry
   - Agronomy and Plant Genetics
   - Entomology and Economic Zoology
   - Horticulture
   - Plant Pathology and Botany
   - Soils
4. Agricultural Engineering

Memo:- Studying majoring in Dy. Prod (Animal Ind may incl Ag. Bio 103, Dy. Chem in minor in Ag. Science + Pl Ind).

B. Groups from which electives only may be chosen

1. Agricultural Education[1]
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 Curricula*

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

I. General Agriculture

Recommended for those students who desire a general curriculum in agriculture. It is designed especially for those who aim to obtain a broad general training and for those who expect to engage in general farming. It emphasizes two features, viz.: to include in its subject-matter the principal fields of study in agriculture and to select the essential courses necessary to an understanding of these fields. A sufficient number of electives is provided to permit the student to emphasize any special line in which he may become interested.

This curriculum is completely included in the curricula in agricultural education and agricultural extension, and in the general curricula in farm management and agricultural economics. It is included, with only a few substitutions, in the curricula in animal husbandry, dairy husbandry, and in horticulture.

[1] All students intending to teach agriculture are referred to the required curriculum in Agricultural Education, pages 19 to 20.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
Agron. 131f,w, Principles of Genetics, 3 (Bot or Zool. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 2 or 5

Winter Quarter

Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Electives, 8

Spring Quarter

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Eng. 12s, Field Machinery, 3
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 8s, Fundamentals of Feeding and Management, 5
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 0 or 3

SENIOR YEAR

Fall Quarter

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

Agr. Econ. 141w,[1] Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
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

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

2. General Curriculum in Agricultural Economics

Opportunities for majoring in Agricultural Economics are offered in various lines. Those who desire to take a general curriculum 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 Economics, in the junior and senior years. It is desirable to consult the head of the Department of Agricultural Education earlier to avoid

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

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. It is recommended that electives be chosen from courses in Agricultural Education or from such of the following as will best complete a well-balanced preparation in subject-matter:

Agr. Eng. 12; Agron. 122, 132, 133; For. 37; Pl. Path. 9; Poult. 1; Pub. and Rur. Jour. 19.

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Ed. 21f, Vocational Education, 3	Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)	Agr. Ed. 181f, Teaching Agriculture, 5 (See Part II)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)	Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. 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, 0 or 3	
Winter Quarter	
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)	Agr. Ed. 182w, Teaching Agriculture, 5 (See Part II)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)	Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)	Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Vet. 9w, Veterinary Studies, 3	Electives, 6
Electives, 5	
Spring Quarter	
Agr. Ed. 11f,w,s, Principles of Vocational Education, 3	Agr. Ed. 42f,w,s, Supervised Teaching Experience, 3 (See Part II)
Agr. Eng. 40f,s, Mechanical Training I, 3	Agr. Ed. 183s, Teaching Agriculture, 5 (See Part II)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)	Electives, 9
An. Husb. 8s, Fundamentals of Feeding and Management, 5	
Vet. 10s, Veterinary Studies, 3 (Vet. 9)	

Never 19. 181, 182.
13 3.
appears Ag. Ed. 151, 152.
75 + 41 = total

4. General Curriculum in Agricultural Engineering

Suggested for those who intend to prepare for general farming, with emphasis on engineering. Students desiring a professional curriculum in Agricultural Engineering are referred to the outline on pages 27 to 29.

JUNIOR YEAR — SENIOR YEAR

Fall Quarter

Agr. Eng. 5f, Farm Building Construction, 3
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 3

Agr. Eng. 19f, Elementary Surveying, 3 (Agr. Eng. 3, 11 or equiv.)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb.)
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. 31w,s, Principles of Drainage, 3
Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Electives, 2

Agr. Eng. 24f,w, Agricultural Physics I, 4 (Agr. Eng. 11, 23 or equiv.)
Agr. 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. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Eng. 12s, Field Machinery, 3
Agr. Eng. 13f,s, Gas Engines, 3
Agr. Eng. 14s, Elementary Farm Power, 3 (Agr. Eng. 13)
An. Husb. 8s, Fundamentals of Feeding and Management, 5

Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
Agr. Eng. 25w,s, Agricultural Physics II, 4 (Agr. Eng. 24)
Agr. Eng. 37s, Rural Sanitation, 3
Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
Electives, 4

5. General Curriculum in Animal Husbandry

For those who aim to make a special study of livestock as a preparation for (a) various phases of livestock farming, for (b) the technical positions relating to livestock, and for (c) further study in graduate work when the student desires to prepare for college, experiment station, and government research and similar positions requiring a still greater degree of specialization.

JUNIOR YEAR — SENIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agron. 103f,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 of Reproduction, 4 (Vet. 2-3-4)

Winter Quarter

Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)
Electives, 2

Agr. Econ. 143w[1], Marketing Organization: Livestock and Meats, 3 (Agr. Econ. 40)
Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
An. Husb. 6w, Livestock Feeding, 5 (Agr. Biochem. 15)
Vet. 12w, Infectious Diseases, 3 (Vet. 2-3-4, Bact. 41)

Spring Quarter

Agron. 123s, Forage Crops, 3 (Agron 1, Bot. 9 cred.)
Agr. Eng. 12s, Field Machinery, 3
An. Husb. 4s, Livestock Judging, 3 (An. Husb. 2-3)
An. Husb. 9s, Pedigrees and Herd Books, 3 (An. Husb. 5)
Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
Electives, 2

An. Husb. 102s, Horse Husbandry, 3 (An. Husb. 5, 6) or
An. Husb. 103s, Beef Cattle Husbandry, 3 (An. Husb. 5, 6) or
An. Husb. 104s, Sheep Husbandry, 3 (An. Husb. 5, 6) or
An. Husb. 105s, Swine Husbandry, 3 (An. Husb. 5, 6)
Electives, 14

6. General Curriculum in Dairy Husbandry

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

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 1)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
Vet. 2f, Comparative Anatomy and Physiology of Domestic Animals, 3
Electives, 2

SENIOR YEAR

Fall Quarter

Agr. Econ. 110f, Economics of Agricultural Production, 3 (Agr. Econ. 2)
Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
Dy. Husb. 105f, Seminar I, 1 (3 courses in dy. husb.)
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 2

Winter Quarter

Agron. 122w, Grain and Hay Grading, 3 (Agron. 1, Bot. 9 cred.)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)
Dy. Husb. 2w, Dairy Bacteriology, 5 (Bact. 41)
Vet. 3w, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 2)

Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
An. Husb. 5w, Livestock Breeding, 3 (Agron. 131)
Dy. Husb. 103w, Dairy Stock Feeding, 3 (Dy. Husb. 101, Agr. Biochem. 15)
Dy. Husb. 106w, Seminar II, 1 (3 courses in dy. husb.)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)

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

Spring Quarter

Agron. 101s, Farm Management, 3 (Agron. 1, Econ. 2)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
Dy. Husb. 104s, Advanced Study of Dairy Breeds, 3 (Dy. Husb. 6, 101)
Sociol. 1f,w,s, Introduction to Sociology, 3
Vet. 4s, Comparative Anatomy and Physiology of Domestic Animals, 3 (Vet. 3)
Electives, 2
Agr. Econ. 40s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Eng. 40f,s, Mechanical Training I, 3
Animal Husbandry 105s, Swine Husbandry, 3 (An. Husb. 5, 6)
Electives, 8

7. General Curriculum in Dairy Products

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

Agr. Biochem. 15, 101, 102, 103
Agr. Econ. 25, 130, 131, 140, 141, 142
Agron. 102, 103
Agr. Eng. 24, 25, 40
Dy. Husb. 2, 4, 101, 102, 105, 107, 111, 112, 113, 115
The minor may be in Agricultural Economics or Agricultural Biochemistry.

8. General Curriculum 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 curriculum and suggested electives which add an emphasis upon those subjects which bear on technical farm management.

JUNIOR YEAR

Fall Quarter

Agr. Biochem. 15f, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
Agron. 121f, Grain Crops, 3 (Agron. 1, Bot. 9 cred.)
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
An. Husb. 2f, Types and Breeds of Livestock, 3 (An. Husb. 10-11)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements)
Electives, 2 or 5

Winter Quarter

Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
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 (Zool. 16)
Electives, 5

SENIOR YEAR

Fall Quarter

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
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. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
Sociol. 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
Vet. 9w, Veterinary Studies, 3
Electives, 5

Spring Quarter

Agron. 101s, Farm Management, 3 (Agron. 1, Agr. Econ. 2)
Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.)
Agr. Eng. 12s, Field Machinery, 3
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

Agr. Econ. 50s, Farm Finance, 5 (Agr. Econ. 2)
Agron. 104s, Types of Farming, 3 (Agron. 103)
Vet. 10s, Veterinary Studies, 3 (Vet. 9)
Electives, 6

9. 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 curriculum 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 underlying studies 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.

10. General Curriculum in Horticulture

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

JUNIOR YEAR

Fall Quarter

Agron. 121f,[1] Gran Crops, 3 (Agron. 1, Bot. 9 cred.)
Hort. 6f, Fruit Growing, 3 (May be omitted if completed as a part of the general requirements.)
Hort. 56f, Plant Propagation and Nursery Practice, 3
Pl. Path. 1f, Plant Pathology, 5 (Bot. 9 cred.)
Electives, 3 or 6

Winter Quarter

Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)
Hort. 21w. Small Fruit Culture, 3 (Hort. 6 or 32, Bot. 9 cred.)
Hort. 135w, Truck Crops and Potatoes I, 3 (Hort. 32, Bot. 9 cred.)
Electives, 5

SENIOR YEAR

Fall Quarter

Hort. 93f, Judging Horticultural Crops, 2 (Hort. 6 or 32)
Hort. 107f, Orchard Management, 3 (Hort. 6, Bot. 9 cred.)
Hort. 136f, Truck Crops and Potatoes II, 3 (Hort. 135)
Hort. 193f, Horticultural Seminar, 1 (Hort. 9 cred.)
Sociol. 14f,w,s, Rural Sociology, 3 (Sociol. 1 or sr. class.)
Electives, 5

Winter Quarter

Agr. Eng. 7w, Farm Structures I, 3 (Agr. Eng. 3)
Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Hort. 110w, Horticultural Crop Breeding, 3 (Agron. 131)
Hort. 194w, Horticultural Seminar, 1 (Hort. 193)
Electives, 7

[1] Agron. 123s, Forage Crops, 3 (Agron. 1, Bot. 9 cred.) may be substituted for this course.

Spring Quarter

Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Eng. 13f,s, Gas Engines, 3 or Agr. Eng. 40f,s, Mechanical Training I, 3
Bot. 22f,s, Elementary Plant Physiology, 5 (Bot. 2 or 5, org. chem. advised)
Hort. 32s, Vegetable Growing, 3 (May be omitted if completed as a part of the general requirements.)
Pl. Path. 112s, Diseases of Fruit Crops, 3 (Pl. Path. 1 or 10) or
Pl. Path. 113s, Diseases of Vegetable Crops, 3 (Pl. Path. 1 or 10)
Electives, 0 or 3

Agr. Econ. 142s,[1] Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)
Agr. Eng. 12s, Field Machinery, 3 or
Agron. 132w, Farm Crops Plant Breeding, 3 (Agron. 131)
Agron. 103w,s, Farm Management Operation, 3 (Agron. 103)
Electives, 5

11. Landscape Gardening

A suggested curriculum 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.)
Electives, 8

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. 22w,s, Freehand Drawing, 2
For. 27w, Groves and Windbreaks, 3
Hort. 73w, History of Landscape Gardening, 3
Electives, 9

Ent. 3f,w, Economic Entomology, 3 (Zool. 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 (Pol. Sci. 51)
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.)
Electives, 7

Agr. Eng. 31w,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

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

AGRICULTURAL SCIENCES

Opportunity is offered to students who have completed the required courses of the Technical Agricultural curriculum and who desire to specialize in the various branches of agriculture and agricultural sciences. Students who desire such specialization are advised, however, to follow the requirements of the Agricultural Science curriculum from the beginning of the freshman year. In all cases it is assumed that such students will spend one or more years in graduate study. Only those students who have had high scholarship records in their undergraduate curriculum and who have a clear understanding of the study to be pursued and who have a lasting and abiding enthusiasm for the chosen field of specialization should enter upon these curricula. Since a comparatively small number of students will enter these special curricula and since the specialization may vary considerably even in one field with the individual student, complete curricula are not suggested in all lines.

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

Students are advised to construct a curriculum in accordance with the open elective system (Method I, page 17) including as many of the subjects listed under the General Curriculum in Agriculture as are consistent with their special curriculum. The attention of the student is also called to the modern language requirements for graduate students. In many divisions French or German is required for the Master's degree and in all cases both French and German are required for a degree of doctor of philosophy. At least one modern language should be obtained during the undergraduate work.

The divisions offering such opportunities for specialization are listed below. In each case the student should consult with the division in the selection of his major, minor, and electives.

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

B. AGRICULTURAL SCIENCE CURRICULUM

This curriculum requires 192 credit hours for graduation and is made up of (1) required courses with such options as are indicated in the freshman and sophomore years, and (2) a major and electives in the junior and senior years.

FRESHMAN YEAR

1. *Non-credit courses* required for graduation in addition to the 192 credit hours.

Freshman 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.

Bot. 4f-5w-6s, General Botany, 9 or Zool. 14f-15w-16s, General Zoology, 9.

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

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

Math. 5f,w,s, Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6) or modern language, 15

Rhetoric 1f,w,s-2w,s,f-3s,f,w, Rhetoric, 9

SOPHOMORE YEAR

1. *Non-credit courses* required for graduation in addition to the 192 credit hours.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *General courses.*—The following courses may be registered for any quarter that they are offered, except that the proper sequence of continuation courses and the prerequisites must be observed.

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

Bot. 4f-5w-6s, General Botany, 9 or Zool. 14f-15w-16s, General Zoology, 9

Bact. 41f,w,s, General Bacteriology, 5 (Chem., zool.)

Math. 5f,w,s, Higher Algebra, 5; Math. 6f,w,s, Trigonometry, 5 (Math. 5 or equiv.); and Math. 7f,w,s, College Algebra, 5 (Math. 6) or modern language, 15

Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, Rhet. 22 advised)

Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

JUNIOR AND SENIOR YEARS

1. A major sequence of 24 to 36 credits from one of the following fields:

(a) Agricultural Biochemistry	(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 ~~31~~ credit hours must be in technical agriculture or in sciences fundamental thereto.

Dairy Manufacture 21 cr.

C. AGRICULTURAL ENGINEERING

(Professional Curriculum)

This curriculum leads to the degree of bachelor of agricultural engineering and is offered jointly by the College of Agriculture, Forestry, and Home Economics, and the College of Engineering and Architecture. Three distinct lines of specialization are provided, namely, Farm Buildings, Farm Machinery, and Reclamation. (See also general curriculum in

Agricultural Engineering for students in Agriculture who desire to major in this field, page 20.)

FRESHMAN YEAR

During the freshman year those following this curriculum will register in the College of Engineering and Architecture and follow the work of the freshman year as outlined in the bulletin of that college.

SOPHOMORE YEAR

The following courses should be scheduled for the quarter as indicated below. For the last three years of the curriculum students are registrants both of the College of Agriculture, Forestry, and Home Economics, and the College of Engineering and Architecture.

1. *Non-credit courses* required for graduation.

Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *General courses.*

Agr. Eng. 13f,s, Gas Engines, 3
Agr. Eng. 19f-20s, Surveying, 6 (Draw. 3 or M. & M. 12, or equiv.)
Agr. Eng. 24f,w-25w,s, Agricultural Physics, 8 (M. & M. 13, Agr. Eng. 23 or equiv.)
Agr. Eng. 31w,s, Principles of Drainage, 3
Agr. Eng. 40f,s, Mechanical Training I, 3
Agron. 1f,w,s, General Farm Crops, 3
Hort. 6f, Fruit Growing, 3. Those entering without high school physics must postpone Hort. 6 until later in their curriculum 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 (Inorg. 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 curriculum in Agricultural Engineering. Electives should be chosen from the recommended list with a view to specialization in one of the three fields of work.

Fall Quarter

JUNIOR YEAR

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)

SENIOR YEAR

Agr. Eng. 122f, Power Machinery, 4 (Agr. Eng. 12, 13, 25)
Agron. 102f,w, Farm Management Organization, 3 (Agr. Econ. 2, Soils 4)
C. E. 144f, Reinforced Concrete, 3 (M. & M. 85)
Electives, 8

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)

Agr. Eng. 121w, Steam Boilers and Engines, 3 (Agr. Eng. 25, 40)
Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
G. E. 101w, Contracts and Specifications, 3 (sr. class.)
Electives, 9

Spring Quarter

Agr. Eng. 12s, Field Machinery, 3
Agr. Eng. 134s, Agricultural Hydraulics, 3 (Agr. Eng. 25, M. & M. 25)
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
Agr. Eng. 37s, Rural Sanitation, 3
Agr. Eng. 126s, Selection of Farm Equipment, 3 (Agr. Eng. 14, 122)
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, 5

RECOMMENDED ELECTIVES

1. Farm Structures
Agr. Eng. 5, 36, 67, 111, 112, 136; For. 27; Hort. 77; Rhet. 22
2. Farm Mechanics
Agr. Eng. 14, 15, 28, 101, 123, 125, 135, 136; Rhet. 22
3. Reclamation
Agr. Eng. 28, 101, 102, 103, 104, 136, 141; C. E. 161; Hort. 77; Rhet. 22

D. AGRICULTURAL BUSINESS ADMINISTRATION CURRICULUM

This curriculum offers an opportunity for those who wish to prepare specifically for some branch of agricultural business, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The first two years are prescribed and include introductory courses in agriculture, economics, and the fundamental sciences necessary for further work in agriculture and economics. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics. The junior and senior years are offered in the School of Business Administration. The transfer to the School of Business Administration 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 11. Approximately one third 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 16, except that students are advised to take Math. 8 rather than Agr. Eng. 9-10, or 11; or Math. 5 if they do not have the prerequisites for Math. 8. If any course of the freshman year is deferred, it should be An. Husb. 10-11, to the sophomore year.

SOPHOMORE YEAR

The following courses should be scheduled for the quarters as indicated below.

1. *Non-credit courses* required for graduation.
Mil. Sci. 4f-5w-6s, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.

2. *Freshman courses* which were not completed during the freshman year.
3. *General courses.*
Agr. Econ. 1f, Principles of Economics I, 5
Agr. Econ. 2w, Principles of Economics II, 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. 50s, Farm Finance, 5 (Agr. Econ. 2) (Formerly Ag Econ.
[1]Econ. 20, Elements of Accounting, 3
Econ. 25w-26s, Principles of Accounting, 6
Psychology 1f-6w, General Psychology for Business Students, 6
Zool. 14f-15w-16s, General Zoology, 9
4. *Electives.*—Enough elective credits should be selected to make with the required work of the freshman and sophomore years a total of 101 credit hours.

JUNIOR YEAR

Memo Econ 143-144. Financial system now divided into two courses. Elem course Econ 3. Mech & Exchange & finance course Econ 141)

A. *General Requirements*
Bus. Adm. 100f,w,s, Report Writing, 1 (To be taken in connection with Econ. 141)
Econ. 51f-52w-53s, Business Law, 9 (10 cred. in pol. sci. or 10 cred. in econ. or 5 cred. in each)
Econ. 141f,w,s, Monetary and Banking Policies, 3 (Econ. 3 and 4 or 6-7)
B. *Special Requirements*
Agr. Econ. 30f, Prices of Farm Products, 3 (Agr. Econ. 2)
Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Econ. 90f, Agricultural Statistics, 5 (Agr. Econ. 2)
Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
Agr. Econ. 131w, Market Prices, 3 (Agr. Econ. 40)
Agr. Econ. 141w, Marketing Organization: Dairy and Poultry Products, 3 (Agr. Econ. 40)
Agr. Econ. 142s, Marketing Organization: Fruits and Vegetables, 3 (Agr. Econ. 40)

SENIOR YEAR

A. *General Requirements*
Bus. Adm. 58, Public Finance, 3
Bus. Adm. 71, Traffic Management, 3
Bus. Adm. 101f,w-102w,s, Advanced General Economics, 6 (Econ. 4 or 6-7)
Bus. Adm. 139s, Advanced General Accounting, 3 (Econ. 25-26)
Econ. 149f,w,s, Business Cycles, 3 (Econ. 3 and 4 or 6-7)
B. *Special Requirements*
Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 90)
Agr. Econ. 150s, Advanced Farm Finance, 3 (Econ. 3 and 4 or 6-7)
Agr. Econ. 170s, Land Economics, 3 (Agr. Econ. 110)

AGRICULTURAL JOURNALISM CURRICULUM

This curriculum is intended for those who wish to prepare for some branch of journalism which relates to agriculture: such as staff positions on agricultural magazines, writing on agricultural questions, editing of bulletins for state and federal departments of agricultural and experimental stations, editing of special farm pages or departments for newspapers, and editing of publications for farm organizations. The first two years are prescribed and include introductory courses in agriculture, journalism, and economics. During the freshman and sophomore years, students will register in the College of Agriculture, Forestry, and Home Economics, and during the junior and senior years, will become registrants in both

[1] Students who have had a high school course or experience in bookkeeping may be exempted from this course and admitted to Econ. 25-26 by passing a placement test.

the College of Agriculture, Forestry, and Home Economics and the College of Science, Literature, and the Arts.

FRESHMAN YEAR

The freshman year consists of the regular freshman courses outlined on pages 15 to 16 except that English Survey A-B-C should be substituted for Rhetoric 1-2-3.

SOPHOMORE YEAR

Mil. Sci. 4-5-6, Basic Course. Students found to be physically unfit may be required to substitute special corrective exercises in physical education.
Agr. Econ. 1f,w,s-2w,s, Principles of Economics I-II, 8
Agr. Econ. 6s, Economic History of Agriculture, 5 (Agr. Econ. 1 or parallel)
Agr. Econ. 8s, Rural Economics, 3 (Agr. Econ. 1)
Engl. 11f,w,s-12w,s, Description and Narration, 6 (A-B-C, or 4-5-6 or exemption from req.)
Jour. 13f, Introduction to Reporting, 3 (Engl. A-B-C, Comp. 4-5-6 or exemption)
Jour. 14w-15s, Newspaper Reporting and Correspondence, 6 (13 or practical experience, and Comp. 11-12 or 18-19)
Psy. 1f-6w, General Psychology (for business students) 6
Zool. 14f-15w-16s, General Zoology, 9

JUNIOR YEAR

Agr. Econ. 40s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agr. Econ. 90f, Agricultural Statistics, 3 (Agr. Econ. 2)
Agr. Econ. 110f-111w, Economics of Agricultural Production, 6 (Agr. Econ. 2)
Jour. 51f-52w, Newspaper Copyreading and Make-Up, 6 (Jour. 15)
Jour. 57s, Magazine Typography, 2 (Jour. 51)
Jour 69s, The Writing of Special Articles, 3
Sociol. 1f,w.s, Introduction to Sociology, 5
Sociol. 14f,w,s Rural Sociology, 3 (Sociol. 1 or sr. class.)

SENIOR YEAR

Agr. Econ. 30f, Prices of Farm Products, 3 (Agr. Econ. 2)
Agr. Econ. 135s, Methods of Price Analysis, 3 (Agr. Econ. 30, 90)
Agr. Jour. 10f-11w-12s, Agricultural Journalism, 9 (Jour. 13-14-15, 51-52)
Econ. 149f, Business Cycles, 3 (Econ. 3 and 4 or 6-7)
Jour. 75s, Law of the Press, 3 (Jour. 51)
Jour. 104f, Editorial Writing, 3 (Jour. 73 and 25 cred. in soc. sci.)
Jour. 191w-192s, Topics Course, 6 (Jour. 104, 110)
Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Prin. of Econ.)

RECOMMENDED ELECTIVES

Agr. Econ. 25, 126, 170; Agr. Ed. 11, 75; Engl. 44-45; For. 1; Geog. 51; Jour. 60-61, 70-71; Pol. Sci. 1, 2; Sociol. 110, 112.

MINOR IN JOURNALISM

For students in the various divisions of the College of Agriculture, Forestry, and Home Economics wishing a short course in journalistic writing, elections from the following program are recommended:

Engl. Comp. 11-12; Jour. 13, 41, 69, 70-71.

MAJOR IN HOME ECONOMICS

Jour. 65.

CURRICULA IN FORESTRY

The curriculum is made up of 204 credit hours of work including:

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

2. Elective courses, 47 to 64 credit hours, distributed according to several methods described below (pages 34 to 36).

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

REQUIRED COURSES

Required courses, 140 to 157 credit hours, are required of every student before graduation. These are considered fundamental and necessary to any curriculum in forestry. For some students the outline for the first two years, given below, represents more than the regular amount of work of 17 credit hours per quarter. In such cases those subjects which cannot be taken in the freshman and sophomore years must take precedence the following year. 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.

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

Bot. 1f,s, General Botany, 4, and 6 credits selected from the following: Bot. 2, 5, 7, 12, 13, 21, 22

For. 1f, General Forestry, 3

For. 3w, Dendrology, 3

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

For. 4s, Dendrology, 4

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

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

[1]Math. 5f,w,s, Higher Algebra, 5

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

Req for Math 5w & Math 6w.

[2]Rhet. 1f,w,s, Rhetoric I, 3

Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)

Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)

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. Econ. 1)

Agr. Eng. 19f-20s, Surveying, 6 (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 curriculum.

For. 7f-8w, Forest Mensuration, 10 (For. 3-4)

Geol. 1f,w,s, General Geology, 5 or Geol. 29f, General Physiography, 5 or Geol. 8

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)

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

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,w-25w,s, Agricultural Physics, 8 (Math. 8, Agr. Eng. 11, 23 or equiv.)

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

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

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

For. 126f, Silvics, 3 (For. 3-4)

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 77.

3. *Special courses* selected from one of the major groups (pages 34 to 36 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. 127)
For. 134f-135w, Forest Problems, 4 (sr. class.)

ELECTIVE COURSES

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

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

a. A major of from 24 to 36 credit hours chosen from one of the following groups.

b. Electives, sufficient to meet the number of credit hours required for graduation chosen from any of the courses offered in the University except those included in the group from which the major is chosen.

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) Botany 21 ok.

The major will be selected from the following:

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10
Agr. Econ. 25f,w, Principles of Accounting, 4
Agron. 131f,w, Principles of Genetics, 3
Bot. 7s, Taxonomy of Flowering Plants, 3
Bot. 22f,w,s, Elementary Plant Physiology, 3

Bot. 101f,w, Elementary Biometry, 3
Bot. 131f, Field Ecology, 5
Bot. 132w, Ecological Anatomy, 5
Bot. 133s, Plant Geography of North America, 5
Bot. 141f-142w-143s, Advanced Plant Physiology, 15
Chem. 31w-32s, Elementary Organic Chemistry, 10
Econ. 26f,w,s, Principles of Accounting, 4
Econ. 72w, Economics of Transporation, 3
Econ. 73s, Railway Traffic and Rates, 3
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. 129f, American Silvicultural Practice, 3
For. 136f, Forest Economics, 3
Geog. 33, Climatology, 3 (course no longer to 133 - in 1929-30 S. L. A. Bull.
Geol. 2w-3s, General Geology, 10
Org. Chem. 51f-52w-53s, Organic Chemistry, 15
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. 40f,s, Principles of Marketing Organization, 3
Agr. Econ. 50s, Farm Finance, 5
Agr. Econ. 90f, Agricultural Statistics, 5
Agr. Eng. 5f, Farm Building Construction, 3
Bus. Adm. 73w, Transportation Charges, 3
Bus. Adm. 89w, Production Management, 3
Bus. Adm. 155s, Corporation Finance, 3
Econ. 26f,w,s, Principles of Accounting, 4
Econ. 72f,w,s, Economics of Transportation, 3 — Now Journ. in Econ 71 Traffic Mgt.
Econ. 141f,w,s, Monetary and Banking Policy, 3
Econ. 161f,w, Labor Problems and Trade Unionism, 3
For. 13s, Forest Mensuration Laboratory, 2 (Cloquet)
For. 23s, Factory Experience, 3-5
For. 30s, Wood Seasoning, 3
For. 31s, Logging Laboratory, 1 (Cloquet)
For. 107f-108w, Uses of Wood, 6
For. 112w, Advanced Forest Mensuration, 3
For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
For. 132s, Forest Regulation Laboratory, 7 (Cloquet)
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 mathematics and a thoro training in the structure, properties, and uses of wood. The major will be chosen from the following courses:

Agr. Biochem. 2f, Quantitative Methods, 5
Agr. Biochem. 3f,w-4w,s, Types of Carbon Compounds, 6

Agr. Biochem. 7f,w-8w,s, General Agricultural Biochemistry, 10
Agr. Biochem. 101f-102w, Agricultural Quantitative Analysis, 6
Agr. Biochem. 111f-112w, Biochemistry, 6
Agr. Biochem. 113f-114w-115s, Biochemical Laboratory Methods, 6
Anal. Chem. 7f, Quantitative Chemistry, 4
For. 23s, Factory Experience, 3 to 5
For. 29f, Sawmill and Woodworking Machinery, 3
For. 30s, Wood Seasoning, 3
For. 107f-108w-109s, Uses of Wood, 9
For. 113f, Wood Pulp and Paper, 3
For. 114f-115w-116s, Mechanical and Physical Properties of Wood, 9
For. 119f-120w, Advanced Wood Structure, 6
For. 125s, Wood Preservation, 3
Inorg. Chem. 11f,s, Qualitative Chemical Analysis, 4
Math. 7f,w,s, College Algebra, 5
Math. 30f, Analytical Geometry, 5
Math. 50-51-52f,w,s, Calculus, 15
M. & M. 26f,s, Technical Mechanics, 5
M. & M. 128f,w,s, Strength of Materials, 5
Org. Chem. 51f-52w-53s, Organic Chemistry, 15
Phys. 23f,w,s, Heat, 3
Phys. 124s, Pyrometry and Heat, 3

4. Grazing

Suggested for those who wish to prepare themselves for range and management work. It is important that these men should be well prepared in plant physiology, systematic botany, plant ecology, as well as in the underlying principles of forestry. In addition, they should have some knowledge of the feeding and breeding of livestock. Students selecting a grazing major will be permitted to make certain substitutions in the general forestry requirements. The major, however, must include the following courses:

Agr. Biochem. 3f,w-4w,s, Types of Carbon Compounds, 6
Agr. Econ. 90f, Agricultural Statistics, 5
An. Husb. 1f,w, Types and Market Classes of Livestock, 5
An. Husb. 5w, Livestock Breeding, 3
An. Husb. 6w, Livestock Feeding, 5
Bot. 7s, Elementary Taxonomy, 3
Bot. 21f,s, Elementary Ecology, 3
Bot. 22f,w, Elementary Plant Physiology, 3
Bot. 113f-114w-115s, Advanced Taxonomy, 9
Bot. 134s, Research Methods in Ecology, 5
Bot. 140f,w, General Plant Physiology, 5
Soils 4f, Soils, 3
Soils 5s, Soil Fertility, 3

5. Forest Sciences

Suggested for those who wish to specialize in the various branches of forestry or the forest sciences. It is assumed that students who follow this curriculum will spend one or more years in graduate study. Attention is therefore called to the language requirements for advanced degrees. Only those students who have maintained high scholarship records and who appreciate the true spirit of research should contemplate following this specialization.

The major may be selected from any courses offered in the following fields:

Botany	Entomology and Economic Zoology	Plant Pathology
Chemistry	Genetics	Soils
Economics	Geography	

CURRICULA IN HOME ECONOMICS

The curricula in home economics are designed to train young women for homemaking and for a payroll job in which all or most of them engage for at least a short period. Throughout the training period there are a certain number and kind of courses required to safeguard the preparation for homemaking. The first two years are essentially the same for all students irrespective of later specialization for the payroll job. At the close of the sophomore year each student signifies her interest in some special field and prepares for it, e.g., resident or extension teaching along one of several possible lines, dietetics, institution management, etc. By choosing electives wisely it is possible to extend one's training in fields other than home economics, e.g., economics, sociology, journalism, history, literature, etc.

The required courses for the various specializations are outlined on the following pages.

The College of Agriculture, Forestry, and Home Economics, and the College of Education co-operate in the preparation of teachers of home economics. At the beginning of the junior year when a student has acquired 90 credits and 90 honor points and indicates her specialization as the teachers' or the extension curriculum she becomes also a registrant in the College of Education. The teachers' curricula are arranged in accordance with the provisions of the Smith-Hughes Act.

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

HOME EXPERIENCE

Clothing.—Home experience in the construction of garments is required of all students who have completed H.E. 11, as a prerequisite to H.E. 13. The character and amount of home experience will be arranged by a member of the faculty of the textile and clothing section.

Foods.—Home experience in cooking following H.E. 83, is a prerequisite for H.E. 35 and H.E. 49. A conference with a member of the faculty of the foods and cookery section should precede this work. An examination covering this work must be passed. For the schedule of these examinations consult the office of the division.

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. 4w, 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.

H. E. 3f,w,s, Textiles, 5
H. E. 50f,w,s,51w,s,f, Color and Design 6
H. E. 70f,w,s, Nutrition Survey, 2
Inorg. Chem. 1f-2w-3s, General Inorganic Chemistry, 12. Students presenting a year of high school chemistry may omit this course and register for Inorg. Chem. 9-10. Those required to take this course because of inability to carry Inorg. Chem. 9-10 successfully will be allowed not more than 10 credits
Inorg. Chem. 9f-10w, Advanced General Inorganic Chemistry, 10 (1 yr. h. s. chem.). Those required to take Inorg. Chem. 1-2-3 are exempt from this course.
Rhet. 1f,w,s,[1] Rhetoric I, 3
Rhet. 2f,w,s, Rhetoric II, 3 (Rhet. 1)
Rhet. 3f,w,s, Rhetoric III, 3 (Rhet. 2)
Sociol. 1f,w,s, Introduction to Sociology, 3
Zool. 14f-15w, General Zoology, 6

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 (Inorg. Chem. 10 cred.)
Agr. Eng. 23f,s, General Physics, 5. Those presenting a year of high school physics may omit this course and substitute 5 credits elective later in their curriculum
Bact. 41f,w,s, Elementary Bacteriology, 5 (Chem., biol.)
H. E. 15f,w,s, Clothing Problems, 3 (H. E. 3, 51)
H. E. 53f,w,s, Advanced Design, 3 (H. E. 51 or 56)
H. E. 80f,w,s, Foods and Cookery, 5 (Agr. Biochem, 3, 4 parallel). Not required of those who qualify for H. E. 81
H. E. 81w, Foods and Cookery, 3 (Agr. Biochem. 3, 4 parall l). Students who have had high school training in foods work and who satisfactorily pass the test for admission to this course may substitute H. E. 81 for H. E. 80
Psy. 1f,w-2w,s, General Psychology, 6
Rhet. 22f,w,s, Public Speaking, 3 (Rhet. 3)

[1] Special attention is called to rules on delayed credit and to regulations for students with insufficient preparation in English on page 77.

* 1 cr. per qt. total of 4 cr. allowed for Phys Ed. 1, 2, 3 + 22, begin w. fall quart. 1929-30. Hygiene to be incl. in Phys Ed. 1, College Faculty 5-13-29.

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. 83f,w,s, Food Management, 3 (H. E. 80 or 81)
H. E. 85f,w,s, Food Marketing, 2 (Agr. Econ. 1 or parallel)
H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 53)
Physiol. 4f,w,s, Human Physiology, 4 (Inorg. Chem. 4 cred., Zool., 3 cred.)
H. E. Ed. 40f,w,s, Child Training, 3 (Psy. 1-2)
Prev. Med. 52f,w,s, Health Care of the Family, 3 (Bact. 41, Physiol. 4)
Rhet. 11f,w,s, Argumentation, 3 (Rhet. 3, 22 advised) or Rhet. 31f,w,s, Survey of English Literature I, 5 (Rhet. 3)

2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 39 to 45.
3. *Electives.*—Enough electives should be selected to make, with those listed in 1 and 2 above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

SENIOR YEAR

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

H. E. 34f,w, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 35, parallel 83, Agr. Econ. 1 or parallel, Prev. Med. 52)
H. E. 35f,w,s,[1] Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 83, H. E. Ed. 40, or parallel, Prev. Med. 52, home practice in foods and cookery; must parallel H. E. 34)
H. E. 170f,w,s, Nutrition of the Family, 3 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 171f,w,s, Child Nutrition, 3 (H. E. 170 or parallel, H. E. Ed. 40)

2. *Special courses* are prescribed by the curriculum of the line of specialization selected. See special requirements on pages 39 to 45.
3. *Electives.*—Enough electives should be selected to make, with those listed above, from 15 to 17 credit hours each quarter. Full work for the year consists of 48 credit hours.

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

Students should consult with advisers with reference to the required and elective courses which must be chosen to complete a specialization and to make up the 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.

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

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

Elective courses in the College of Science, Literature, and the Arts, are separated into junior college courses (numbered 1 to 49), open to freshmen and sophomores, and senior college courses (numbered 50 to 199), open to juniors and seniors. In addition to satisfying other prerequisites a minimum of 90 credits and 90 honor points must be earned before registering for a senior college elective.

1. General Curriculum in Home Economics

a. *General requirements* as listed above, and

b. *Elective courses* of which the major portion should be chosen from fields other than home economics, e.g., agricultural biochemistry, history, journalism, physics, preventive medicine, sociology, etc.

2. Curriculum in Foods and Nutrition

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
An. Husb. 111w, Utilization of Meats, 3 or
H. E. 75f, Dietetics Laboratory, 2 (H. E. 170 or equivalent and
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 73f,w, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
H. E. 175f,w, Nutrition II, 4 (H. E. 73)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) or
H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)
H. E. 186f,s, Special Food Problems, 3 (H. E. 182) or
H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)

b. *Elective courses.*—Sixteen additional credits must be chosen from the following courses:

Agr. Biochem, 2, 106, 108; Agr. Eng. 34, 35; Bus. Adm. 88, 180, 181, 182; Eng. 31, 32 or 33, 73, 74; German 1, 2, 3, 4, 24, 25, 26, 27, 28, 29; Hist. 1-2, or 2-3; H. E. 60, 61, 63, 163; Jour. 13, 41, 65, 69; Lib. Meth. 1; Math. 3, 4, 5, 6, 7; Phys. Chem. 110; Phys. 3, 4, 23, 24, 43, 44; Pol. Sci. 1; Psy. 56; Rom. Lang., French 1, 2, 3, 8, 9, 10

3. Curriculum in Textiles and Clothing

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equiv., 51, home exp. in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)

b. *Elective courses.*—One of the following groups must be completed.

Group A

H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)
Bus. Adm. 69w, Retail Store Management, 3 (Agr. Econ. 1)
Psy. 56w, Psychology of Advertising, 3 (Psy. 1-2 and Agr. Econ. 1)

Group B

Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
Bot. 1s, General Botany, 5
H. E. 107w, Textile Analysis and Related Problems, 3 (H. E. 102, Agr. Biochem. 2)

4. Curriculum for Dietitians

a. *General requirements* as listed above with the following additional courses:

Agr. Biochem. 2f, Quantitative Methods, 5 (Inorg. Chem. 10 cred.)
Agr. Econ. 25f,w, Principles of Accounting, 4
H. E. 60s, Institution Marketing, 2 (H. E. 61 or parallel, 85)
H. E. 61f,w,s, Quantitative Cookery, 4 (H. E. 83)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 61 or parallel, 83)
H. E. 65w, Institution Equipment, 2 (H. E. 61, 63 or parallel)
H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 75f, Dietetics Laboratory, 2 (H. E. 182 or equivalent)
H. E. 79s, Selected Problems for Dietitians, 3 (H. E. 170 or equivalent)
H. E. 156f,w,s, Hospital Social Service, 3 (H. E. 170 or parallel, 175)
H. E. 163s, Institution Management Problems, 3 (H. E. 61, 63)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
H. E. 175f,w, Nutrition II, 4 (H. E. 73)
H. E. 176w, Advanced Nutrition, 5 (H. E. 73, Agr. Biochem. 2) or 177 [illegible]
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170) + [illegible]
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) [illegible]

b. *Elective courses.*

5. Curriculum in Institution Management

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 25f,w, Principles of Accounting, 4
Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
Econ. 1, Marketing, 3
Econ. 161f,w, Labor Problems and Trade Unionism, 3 (20 cred. in soc. sci. incl. Econ. 4 or 6-7)
H. E. 60s, Institution Marketing, 2 (H. E. 61 or parallel, 85)
H. E. 61f,w,s, Quantity Cookery, 4 (H. E. 83)
H. E. 63f,w,s, Institution Experience, 3 (H. E. 61 or parallel, 83)
H. E. 65w, Institution Equipment, 2 (H. E. 61, 63 or parallel)
H. E. 163s, Institution Management Problems, 3 (H. E. 61, 63)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) or
H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)

b. *Elective courses.*—Six credits from Group A and nine credits from Group B must be completed.

Group A.—An. Husb. 111; Bus. Adm. 67, 130, 167; Econ. 51.

Group B.—Agr. Eng. 34, 35; Child Wel. 60; Econ. 3, 149; Eng. 31-32 or 33, 73-74; H. E. 73 or 75 or 173, 150; Jour. 13, 41, 65, 69; Phys. 3, 4, 23, 24, 43, 44; Psy. 56; Rhet. 28, 32, 33.

CURRICULA FOR TEACHERS

(College of Education)[1].

For the junior and senior years the following curricula have been approved by the College of Agriculture, Forestry, and Home Economics and by the College of Education and all students who are candidates for 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 sign specialization card at the beginning of the junior year and meet the following requirements:

6. Teachers' Curricula in General Home Economics

General requirements as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
  Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Hist. Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
  Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
  Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in history) or
  Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home practice in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
  H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Five to ten credits must be elected from Group A and enough credits from Group B to make a total of sixteen credits.

Group A.—Hist. 1-2 or 2-3, Pol. Sci. 1.

Group B.—Bot. 1; Child Wel. 60; Eng. 31-32 or 33, 73-74; H. E. 55, 57, 61, 182, 195, 154, 73 or 75 or 179 or 173; H. E. Ed. 142; Jour. 13, 41, 65, 69; Lib. Methods 1; Psy. 3, 56 or 60; Rhet. 28, 32, 33, 34; Zool. 183.

7. Teachers' Curricula in Home Economics Extension

a. *General requirements* as listed above with the following additional courses:

Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
  Agr. Ed. 11f,w,s, Principles of Vocational Education, 3

[1] See scholarship requirements for admission to the College of Education, page 11.

Ag. Ec. 126.

chg to 00. Psych dept. ltr 12-2-29

Hist. Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist, Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home practice in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture. 3 (H. E. 13, 53)
H. E. 44w, Home Economics Extension Work, 3 (H. E. Ed. 42, 49 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Ten credits from the following courses must be completed.

Agr. Ed. 75; Agr. Eng. 34; Child Wel. 60; Agr. Econ. 25; H. E. 57, 61, 75, 173, 179, 182, 195; Jour. 13, 41, 65, 69; Psy. 56; Rhet. 24; Sociol. 110.

8. Teachers' Curriculum in Foods and Nutrition

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. of Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. of Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170) or
H. E. 175f,w, Nutrition II 4 (H. E. 73) or
H. E. 75f, Dietetics Laboratory, 2 (H. E. 170 or equivalent) and H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80) or
H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)
H. E. 186f,s, Special Food Problems, 3 (H. E. 182) or
H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Fifteen additional credits from the following courses must be completed.

Agr. Biochem. 2, 106, 108; Agr. Eng. 34, 35; Eng. 31-32 or 33, 73-74; German 1, 2, 3, 4, 24, 25, 26, 27, 28, 29; Hist. 1-2 or 2-3; H. E. 11, 13, 17, 18, 60, 61, 63, 65, 136, 150, 163; Jour. 13, 41, 65, 69; Lib. Meth. 1; Math. 3, 4, 5, 6, 7, Phys. Chem. 110; Phys. 3, 4, 23, 24, 43, 44; Pol. Sci. 1; Rhet. 28, 32, 33, 34, Rom. Lang. French 1, 2, 3, 8, 9, 10.

9. Teachers' Curriculum in Textiles and Clothing

a. *General requirements* as listed above with the following additional courses:

Agr. Econ. 126s, Economics and Consumption, 3 (Agr. Econ. 1)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School 3 (Ed. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home experience in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53) or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)
H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)
H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

b. *Elective courses.*—Eleven additional credits from the following courses must be completed.

Agr. Biochem. 2; Botany 1; H. E. 17 or 18, 55, 57, 107, 154, 195.

10. Teachers' Curriculum in Related Art

a. *General requirements* as listed above with the following additional courses:

Art Ed. 4f-5w-6s, Still Life, 3
Art Ed. 7f-8w-9s, Sketch, 3
Art Ed. 29f-30w-31s, Sketch, Course II, 3 (Art Ed. 7, 8, 9)
Ed. Psy. 55f,w,s, Educational Psychology, 3 (Psy. 6 cred.) or
Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Hist. of Ed. 1f,w,s, Brief Course in the History of Education, 5 (6 cred. in psy.) or
Hist. of Ed. 5s, Public Education in the United States, 3 (6 cred. in psy.) or
Hist. of Ed. 101f, Foundations of Modern Education, 3 (6 cred. in psy. and 6 cred. in hist.) or
Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home experience in garment making.)
H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
H. E. 57s, Batik and Other Crafts, 3 (H. E. 3, 53 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
H. E. 152w, Advanced Interior Design, 3 (H. E. 53, 131, 150)
H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)
H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)

H. E. Ed. 49f,w,s, Observation and Teaching: General Home Economics, 8 (H. E. Ed. 42. In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H. E. 3, 11, 50, 51, 53, 80 or 81, and 83)

H. E. Ed. 147w, Organization and Methods for Related Art Teaching, 3 (H. E. Ed. 42 or parallel, H. E. 53, 131 or parallel)

b. *Elective courses.*

II. Research in the Field of Home Economics

In the undergraduate curricula there is not sufficient opportunity to prepare prospective research workers adequately except in so far as electives may be used in that direction, with the expectation of going ahead with graduate study following graduation with the baccalaureate degree. Persons interested in research in textiles, nutrition, home management, home economics education, related art, home equipment, etc., should choose all electives following consultation with a faculty member interested in that particular field.

DESCRIPTION OF COURSES

AGRICULTURAL BIOCHEMISTRY

This division offers two types of work, namely, courses in those phases of chemistry which have special application in agriculture or home economics for students whose major work is in other divisions; and courses designed to train chemists for research or instruction in the special field of agricultural biochemistry.

2. Quantitative Methods. Principles of quantitative analysis, including stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations.

3-4. 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. Biochemistry in Industry. A seminar course.

108. Chemistry of Wheat and Wheat Products. A lecture course, with collateral library reference work, on the chemical technology of the production and milling of wheat and the conversion of its products into human food.

110. Flour Laboratory Methods. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry.

111-112. Biochemistry. Advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes, and pigments and their physiochemical relations to the vital processes involved in growth and nutrition.

113-114-115. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112, using recent methods for the investigation of biologically important compounds.

116. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, and vitamins.

117. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies.

118. Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, the study of biochemical reactions, and special methods of identification or determination of biochemical products.

AGRICULTURAL ECONOMICS

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.

7. Natural Resources. See under Agron. 7 for course description.

8. Rural Economics. An economic analysis of a number of the important social problems of agriculture, including rural organization, tenancy, farm incomes, rural population and standards of living, agricultural policy.

25. Principles of Accounting. Same as Economics 25 but credit is allowed without the completion of Economics 26.

30. Prices of Farm Products. Past and probable future trends in prices of important farm products. Adjustment of production to price changes, foreign competition. Price stabilization.

40. Principles of Marketing Organization. The principles of the organization of the market and of marketing enterprises, both proprietary and co-operative.

47. Marketing Accounting.

50. Farm Finance. The mechanism of exchange with special reference to the financing of the production and marketing of farm products.

90. Agricultural Statistics. Statistical method applied to the analysis of agricultural data; collection, tabulation, and graphical presentation; averages; measures of dispersion; index numbers; time series.

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.

131. Market Prices. Manner in which prices are determined in the market place. Local, wholesale, and retail prices. Price fluctuation and speculation. Prices and market grades. Market quotations.

135. Methods of Price Analysis. Statistical methods for the study of the forces determining prices, forecasting price changes, and determining "established prices." Survey of research work in the field.

140. Marketing Organization: Staples. Principles of production economics applied to the organization of markets and marketing organization for the grains, tobacco, cotton, and wool. Special attention to co-operative organization.

141. Marketing Organization: Dairy and Poultry Products.

142. Marketing Organization: Fruits and Vegetables.

143. Marketing Organization: Livestock and Meats.

144. Co-operative Organization. Development of co-operation in agriculture in the United States and foreign countries. Analysis of economic problems peculiar to co-operative organization, especially of marketing agencies.

150. Advanced Farm Finance.

170. Land Economics. Land as a factor of production; rural and urban utilization; rents and land values; land classification; land exchange.

171. Land Tenure. Property in land; tenancy; farm labor; evolution of the tenure classes.

191. Advanced Agricultural Statistics. Analysis of agricultural data by methods of correlation, partial and multiple correlation.

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. (Not offered in 1928-29.)

42. Supervised Teaching Experience. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings.

64. Survey of Agriculture. A course in general agriculture designed to give students practical familiarity with fundamental principles and basic facts, best procedures, literature, and important problems of agriculture in this region.

75. Visual Presentation. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assist in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums.

81. Extension Work. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work of Minnesota.

82. Agricultural Extension Field 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.

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. (Not offered in 1928-29.)

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 coordination of work. (Not offered in 1928-29.)

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. Emphasis on current problems in meats, milk, poultry, plant pathology, mechanical training, and other essentials for teachers of agriculture.

171. Problems in Procedure. For agriculture teachers. Emphasizes working out problems in detail in order that the processes as formulated can be used in teaching the following year by those enrolled. Discussions, readings, papers, laboratory.

176. Problems in Visual Presentation. Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research.

181-182-183. Teaching Agriculture. A study of all activities of the teacher in conducting a high school agriculture department in Minnesota including all day, part time, evening, and elementary classes, and community activities. Observation, participation, reading, preparing plans, criticisms, discussions, reports.

191-192-193. Seminar in Agricultural Education. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature.

AGRICULTURAL ENGINEERING

3. Mechanical Drawing. Materials, instruments, and their uses. Lettering, scale reading, conventional symbols, and blue printing. Orthographic projection, pictorial drawing, and planning farm buildings (Agriculture); or records and plots of surveys, contour and profile map tracing (Forestry).

5. Farm Building Construction. Instruction and practice in estimating, framing, construction, and painting of farm buildings.

7. Farm Structures I. The arrangement, planning, and designing of farm buildings giving special attention to convenience, economy, and the durability of farmhouses, barns, cribs, granaries, hog houses, etc.

9-10. Applied Mathematics. Same as Course 11 extended over two quarters.

11. Applied Mathematics. Rules of practical mathematics with special attention to formulas and problems directly related to agricultural and forestry work; e.g., areas, volumes, progressions, statistics, averages, proportions, variations, investments, cost problems.

12. Field Machinery. Construction, operation, adjustment, and use of soil preparation, seeding and harvesting machinery.
13. Gas Engines. Theory, operation, care, and repair of gasoline engines.
14. Elementary Farm Power. Construction, operation, care, adjustment, testing, and use of the tractor and other sources of farm power. Lectures and laboratory.
15. Ignition and Carburetion. Lecture and shop study of the construction and action of the various forms of ignition and carburetion systems in use on gas engines of all types.
19. Elementary Surveying. Use of tape, level, transit, and traverse board in agricultural field problems, e.g., mensuration surveys, traverses, differential and profile leveling; plotting and mapping. Care and adjustment of instruments.
20. Advanced Surveying. Topographic surveys by stadia and other methods, running simple curves, cross sectioning, plotting the survey, profile building, grade determination, and figuring of quantities in earth work.
23. General Physics. The elements of physics for those who have not had physics in high school. Mechanics, heat, light, and electricity with laboratory work.
24. Agricultural Physics I. An applied course involving lectures and laboratory work in mechanics and heat. 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 operation and development.
34. Household Mechanics. Lectures and recitations on household appliances and methods of operation, such as water supply, plumbing, sewage disposal, washing, cooking, refrigeration, heating, and electrical appliances.
35. Household Physics. A course of lectures and laboratory work on the principles of physics that apply to cooking, cleaning, plant and animal growth, dyeing, and other subjects of household importance. Molecular physics, heat, light, and color.
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; pipe fitting; electric wiring; 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. Power Machinery. A study of those machines requiring mechanical power for their operation, such as feed grinders, corn shredders, ensilage cutters, threshers.
123. Farm Power. Comparative study of the application and cost of the different sources of power to farm machinery and operations.
125. Farm Machinery Design. Drafting room study of design of farm machine parts, e.g., gearing, cams, shafts, flexible connections, etc.; laboratory tests of strength coupled with efficiency of machine parts. Recitation and lecture.
126. Selection of Farm Equipment. 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 hydroelectric 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, FARM MANAGEMENT, AND PLANT GENETICS

1. General Farm Crops. A study of the important field crops of the United States.

7. Natural Resources. A study of the natural resources of the United States and other countries in their relation to agriculture. Attention is given to the importance of these resources and to their wise utilization. Lectures, reference work, and discussions.

101. Farm Management. Farm records—simple farm accounting and the forms and methods employed in making cost of production studies and farm management surveys. Practice in record keeping and accounting.

102. Farm Management Organization. The business side of farming is emphasized. Special attention is given to farm organization and equipment.

103. Farm Management Operation. Continuation of 102. Special attention is given to farm operation.

104. Types of Farming. A study of types of farming and of prevailing farm practices in the principal agricultural production areas.

121. Grain Crops. Structure, function, culture, improvement, and uses of corn, wheat, oats, barley, rye, flax, and buckwheat.

122. Grain and Hay Grading. History of grading, study of grading methods, and actual practice in grading grain and hay samples according to federal standards.

123. Forage Crops. A study of the structure, function, culture, and improvements and uses of forage crops including meadow and pasture management.

124. Special Crops. Climate and soil requirements as related to distribution and culture of the following crops: legumes for seed production, potatoes, sugar beets, sorghum for sirup, flax and hemp for fiber, tobacco, and other minor crops.
125. Advanced Farm Crops. The ecology of crop plants and the application of plant science to crop production.
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.
134. Laboratory Problems in Genetics. Methods of taking and arranging genetics data. Special inheritance problems with Drosophila. Construction of chromosome map.

ANALYTICAL CHEMISTRY

SCHOOL OF CHEMISTRY

1-2. Analytical Chemistry.

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

ANIMAL HUSBANDRY

2-3. Types and Breeds of Livestock. The types as related to performance and production in horses, beef cattle, sheep, and swine, and the origin, history, characteristics, and economic importance of the breeds, classified according to type.
4. Livestock Judging. Practice in judging horses, cattle, sheep, and hogs from both the market and breed standpoint.
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.
10-11. Types and Market Classes of Livestock. Livestock markets, and marketing methods. The market classes of horses, cattle, sheep, and swine. Practice in classifying, judging, and appraising livestock.

101. Advanced Stock Judging. Competitive judging of all types, breeds, and classes of livestock supplemented by visits to nearby stock farms.
102. Horse Husbandry. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses; factors determining a horse's efficiency for work. Practice in decorating horses for the show ring.
103. Beef Cattle Husbandry. Lectures and laboratory work in feeding and management of purebred and grade herds; selection of foundation stock and sires; buildings and equipment; keeping records; recording; advertising; fitting for show and sale; showing; buying; selling; labor.
104. Sheep Husbandry. The care and management of sheep. The fitting of sheep for show and sale. Practice in feeding, shearing, and blocking sheep. The care of young lambs.
105. Swine Husbandry. Hog barn equipment. Building up the breeding herd, private herd records, herd management, fitting and showing. Marketing breeding stock. Barn work and feeding practice.
106. Advanced Meats. Practice work in dressing animals and cutting carcasses, giving particular attention to conformation as related to dressing percentage and the carcass; a study of the physical and chemical composition of meat.
107. Meat Problems. The wholesale cuts and grades of meat; the packing industry and the utilization of by-products. Special problems and trips to packing establishments.
108-109-110. Seminar. Special problems and research assignments on investigations pertaining to the livestock industry.
111. The Utilization of Meats. A detailed study of the different cuts of pork, beef, veal, mutton, and lamb, with reference to prices, relative economy, uses, nutritive value, chemical composition, ripening, curing, palatability. (For Home Economics students.)

ANTHROPOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

51. Introduction to Anthropology.
53. Cultural Anthropology.
54. Cultural Anthropology.
62. Ethnology.
80. The American Indian.
110. Physical Anthropology.
112. The American Negro.
113. The Peoples of Europe.
114. The American People.

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

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

21-22-23. Elementary Freehand Drawing.

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

ART EDUCATION

COLLEGE OF EDUCATION

1-2-3. Fundamental Principles of Design.
4-5-6. Still Life.
7-8-9. Sketch.
10-11-12. Composition.
20-21-22. Principles of Harmony in Form and Color.

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

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

41. General Bacteriology.
103. Soil Microbiology. Studies of the microscopic inhabitants of the soil, their interrelationships and rôle in the transformations of soil constituents with particular emphasis on the cycles of carbon, nitrogen, and sulphur in nature.
105. Food Bacteriology. The decay, fermentation, and putrefaction of foods; molds; canning; bacterial food poisoning.

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

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

1. General Botany.
2. Elementary General Morphology of Plants.
3. Forest Botany. Field work in the classification and recognition of the herbaceous and shrubby undergrowth of the different forest types, together with quadrat and statistical studies.
5. Elementary Plant Histology.
7. Taxonomy of Flowering Plants.
12. General Morphology of Algae.
13. General Morphology of Fungi.
21. Elementary Ecology.
22. Elementary Plant Physiology.
51. Histological Methods.
63. General Morphology of Angiosperms and Gymnosperms.
101. Elementary Biometry.
113-114-115. Advanced Taxonomy.
118. Cytology.
127. Anatomy of Vascular Plants.
131. Field Ecology.
132. Ecological Anatomy.
133. Plant Geography of North America.
134. Research Methods in Ecology.
141. 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.

CHILD WELFARE INSTITUTE

40. Child Training. A study of the physical and mental development of the child followed by a discussion of the problems of training young children. Observations in the Nursery School, lectures, and reports.
50-51. Nursery School Methods. A consideration of the materials and methods utilized in the training of small children as individuals and in groups. Observations in the Nursery School, 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. To orient student with reference to the nursery school and the parental education movement. Consideration given also to the kindergarten and Montessori movement and to the physical and mental hygiene movement.

120. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child. Primarily for those who have charge of groups of children, and for workers in parental education. Opportunities for observation in the Nursery School and in clinics. In co-operation with the Department of Pediatrics.

130. The Development of the Small Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports.

133-134-135. Observational and Experimental Methods in the Study of the Development of the Young Child. A study of various methods and techniques such as growth records, mental tests, ratings, controlled observations, used in the experimental study of the young child. Practical exercises and problems on institute records and data.

170. Parental Education in Child Care and Training. A consideration of the content and methods used in courses and study groups for parents in the care and training of young children. Lectures, discussions, and reports.

173-174. Technique and Practice of Parental Education. Field work in the technique of organizing and conducting parental study groups and courses for the study of the young child.

190-191. Mental Examination of Pre-School Children. A study of the methods used in testing young children together with practice in such testing.

DAIRY HUSBANDRY

1. Elements of Dairying. Composition of milk. Causes of variation in composition; milk constituents and their uses in dairy manufactures and as food; Babcock test; sanitary handling of milk and cream on the farm; cream separating and farm butter making.

2. Dairy Bacteriology. Lectures and laboratory exercises. Types of milk organisms; the contamination of milk and how prevented; relation of milk to the public health; the bacteriology of dairy products.

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 ADMINISTRATION

1. Marketing Organization.
3. Mechanism of Exchange.
7. Traffic Management.
73. Transportation Charges.
89. Production Management.
103-104. Value and Distribution.
112. Business Statistics.

113-114. Theory of Statistics.
131-132. Cost Accounting.
133. Cost Accounting Systems.
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 Administration.

See also courses in Agricultural Economics.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

COLLEGE OF EDUCATION

119. The Elementary School Curriculum.

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

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

55. Educational Psychology.
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

21-22-23. Introduction to English Literature.
31-32. Development of the English Novel.
33. The Later-English Novel.

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

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Courses in this department are closely correlated with those offered by the Department of Zoology of the College of Science, Literature, and the Arts. Courses 37-38-39, 44, 117-118-119, 125-126-127, 139-140, 144-145-146, and 197 of this division are also offered under these numbers by the Department of Zoology.

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

3. Economic Entomology. The life histories, habits, and methods of control of the insect pests of orchard, field, and garden. Laboratory work in the determination of the more important forms.
4. Economic Vertebrate Zoology. Deals with the various kinds of vertebrate animals (except birds) of Minnesota, the habits and economic status of each, and means by which their numbers may be controlled.
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.

37-38-39. General Entomology. Leads up to discussion of the principles of taxonomy and their application to the classification of insects. Textbook, lectures, quizzes, and laboratory.

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.

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.

175-176. Advanced Economic Entomology. A critical consideration of the principles of insect control and the history of their development.

177. 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.

185. Physical Entomology. A study of precision methods of recording ecological and physiological phenomena: and embodying both the use of instruments and a study of the physical principles involved.

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. Time actually spent in work and study in an approved wood using industry. Complete detailed report is required.
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 Woodworking Machinery. Sawmills, woodworking 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 of wood.

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, laboratory.

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.

50. House and Furniture Woods. The woods used in house construction and finish, furniture, etc. Their identification and properties. Lectures and laboratory.

101. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of 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, 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.

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.

114-115. Physical Properties of Wood. Study of moisture in relation to hardness, strength, stiffness, density, shrinking, swelling, absorption, humidity, etc. Lecture and laboratory.

116. Mechanical Properties of Wood. Study of strength in relation to grain, density, structure, etc. Calculation of stresses, strains, etc. Lecture and laboratory.

119-120. Advanced Wood Structure I. A detailed study of the elements and structure of native and foreign economic woods. Preparation, section-

ing, and mounting of typical sections. Classification of woods based on structure. Reference reading and reports.

122-123. Forestry Seminar. Research problems in silviculture and forest management with special reference to the questions involved in the program of the Lake States Forest Experiment Station.

125. Wood Preservation. Lectures and collateral reading upon the history, development, and methods of wood preservation. Different systems now in use and preservatives used.

126. Silvics. The fundamentals forming the basis of silviculture with special attention to the sylvics of the important tree species. Lectures, readings, and required papers.

127. Silviculture. A study of the general principles underlying the art of silviculture, and a brief study of European methods as applied to American conditions.

128. Silvicultural Laboratory. Nursery practice and field planting. Preparation of a sylvicultural plan for a small tract of timber and the application of that plan.

129. American Silvicultural Practice. A study of the silvicultural methods now being employed in the United States and the probable results of the application of other European methods. Lectures, references, and discussion.

130. Forest Valuation. The business of forest management. A study of the different factors entering into the valuation of forest property.

131. 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.

8. Introductory Geology.
23-24-25. Elements of Mineralogy.
29. General Physiography.

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

GERMAN

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. Beginning A.
2. Beginning B.
3. Beginning C.
4. 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 prerequisites as stated in Part II of the bulletin.

3. Textiles. Textile fibers, their structure, properties, and chemical reactions; fabrics, their structure and processes of manufacture; art and economic consideration in selection and purchase of materials for clothing and household furnishing.
4. Textiles. See bulletins of the College of Science, Literature, and the Arts and Education.
11. Clothing Planning and Construction, A. Provides instruction and practice in planning, buying, cutting, fitting, and making garments of washable materials; sewing machines, care and use; commercial patterns, interpretation and adaptation.

13. Clothing Planning and Construction, B. Laboratory practice in costume modeling; preparation of dress form; adaptation of textile and art principles in selection of materials and designs; instruction and practice in construction of a semi-tailored wool garment and of infant's or children's garments.
15. Clothing Problems. A consideration of the individual clothing budget; care of clothing; clothing in relation to health; the selection of ready-to-wear clothing; children's clothing. Talks by store people and trips to stores and clothing factories are arranged for.
17. Advanced Clothing. Laboratory course in the designing, modeling, and construction of silk or wool costume, including millinery; one problem to test acquired speed.
18. Commercial Clothing Manufacture. Laboratory practice upon commercial basis. Shop organization, with problems involving clothing design and construction.
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. Twelve weeks actual experience in a home management house with various household mangement 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.
50-51. Color and Designing. The principles of color and design related to such problems as selecting and designing costumes, and selecting, arranging, and designing house furnishings.
53. Advanced Design. Principles discussed and problems worked out relating to costume and house furnishing design.
55. Decorative Needlework and Other Crafts. Applied design in needlework the major interest. Other crafts given consideration such as block printing, to be worked out in such problems as book ends, blotter pads, folios.
56. Applications of Color and Design. See Course 50-51.
57. Batik and Other Crafts. Principles of design and color harmony applied to batik and such other crafts as leather tooling, tie dyeing, and lamp shade making. Articles are planned to relate to definite dress and home furnishing problems.
60. Institution Marketing. Problems involved in the purchasing of foods on a large quantity basis. Factors in the production, distribution, and sale of such commodities which affect the wholesale buyer.
61. Quantity Cookery. Application of the principles of cookery to large quantity preparation; planning of meals for dining hall, cafeteria, and tea room; a study of standardized formulae and production costs.
63. Institution Experience. Experience in the minor problems of cafeteria, dining hall, and tea room administration.

65. Institution Equipment. Equipment for the institution food department; materials, construction, operation. Placing of equipment in relation to the routing of work within the unit, and in relation to the work of other departments.
70. Nutrition Survey. Selection of food from a nutritional standpoint and the relation of food to health and efficiency.
73. Nutrition I. (1) The nature and properties of groups of compounds occurring in the cell and in food, (2) digestion, and (3) absorption.
75. Dietetics Laboratory. (1) Food values, (2) problems relating to the selection of food under conditions of health and under such pathological conditions as are chiefly dependent upon diet.
79. Selected Problems for Dietitians. A selected group of problems related to the work of the dietitian involving discussions, assigned readings, and field trips.
80. Foods and Cookery. The development of technique and the application of fundamental science principles to cookery processes. The establishment of good standards for food products.
81. Foods and Cookery. A three-credit course open by examination to a limited number of students. See 80.
83. Food Management. Determination and study of the management factors involved in the food problems of the homemaker.
85. Food Marketing. Food problems of the consumer. A study of the quality and cost of foods on the market. Laboratory and field work.
89. Camp Cookery. Simple cookery processes with adaptations to out-of-door cookery. Laboratory and field work. Not open to home economics students. For prospective foresters, engineers, and others. (Given alternate years. Not offered in 1928-29.)
102. Advanced Textiles. An intensive study of textile materials with special reference to the following: nature of the raw materials; economic, chemical, and physical applications involved in their manufacture and use; methods and significance of physical testing.
107. Textile Analysis and Related Problems. Problems and application of quantitative methods in textile analysis with special reference to establishing standards for fabrics.
115. Clothing Economics. A study of the economic aspects of clothing which directly or indirectly affect the consumer.
131. Home Management: House Planning and Equipment. Study of the small house which aims at more intelligent planning in building and furnishing. House plans, kitchen arrangements, and equipment of house studied from homemaker's point of view of economy, convenience, and beauty.
136. Budget Problems. An intensive study of problems relating to individual and family budgets. Readings, discussions, and field work.
150. Art History and Appreciation. The historical development of painting, sculpture, architecture, decoration, furniture, and costumes, studied with special emphasis on design and influence upon modern styles.

152. Advanced Interior Design. Special problems of small house decoration will be studied. Elevation drawings made. Actual materials will be used as far as possible.

154. Advanced Costume Design. A study of figure construction; line, color, and textures for beautiful arrangements and with reference to individual types. Laboratory work with fabrics and designs carried out in pencil and water colors.

156. Hospital Social Service.

163. Institution Management Problems. Problems affecting the efficient administration of the institution; departmental organization, operation, maintenance; employment problems; business policies. Field trips to various types of institutions.

170. Nutrition of the Family. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health, and under such pathological conditions as are chiefly dependent upon dietetic treatment.

171. Child Nutrition. Lectures, discussions, and field work dealing with the principles of child nutrition and with the formation of desired food habits.

173. Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases.

175. Nutrition II. Metabolism including work on tissues, blood, milk, and urine.

176. Advanced Nutrition. Selected quantitative methods applicable to investigations relating to digestion and metabolism.

177. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, demonstrations, and laboratory work.

179. Readings in Nutrition. A course designed to give intensive experience in the use of nutrition books and periodicals, involving assigned readings, oral and written reports.

182. Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems.

183. Experimental Cookery. The same as Course 182 with additional problems.

186. Special Food Problems. Individual problems in foods and food preparation.

187. Special Food Problems. The same as Course 186 with additional problems.

195. Home Economics Survey. A discussion of the historical development of home economics with special emphasis upon current problems.

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

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.

X 42. Special Methods of Teaching Home Economics. The psychological bases for teaching; methods of teaching applied to home economics. Required of all students preparing to teach.

X 49. Observation and Teaching: General Home Economics. Observation of classes in day schools and evening schools; teaching under supervision of at least two phases of home economics; individual and group conferences on teaching problems.

141. 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.

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

X 143. Home Economics Curricula. A study of the objectives of home economics in the junior and senior high schools; organization of curricula.

147. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes.

149. Research Problems. A study of the methods used in collection, treatment, and interpretation of data in the field of home economics.

HORTICULTURE

6. Fruit Growing. The fundamental principles of fruit growing. Sites, soils, nursery stock, planting and planting plans, tillage, fertilization, cover crops, pollination, frost avoidance, pruning, and thinning. Lectures, recitations, references, and laboratory work.

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.
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.
135-136. Truck Crops and Potatoes. Truck crop production as an applied science. The crop or the plant is used as the unit of consideration and the sciences used to explain cultural practices and plant behavior.
137. Systematic Olericulture. A reading and conference course covering the taxonomy, anatomy, composition, quality, and uses of truck crop plants as a basis of their classification and standardization.
138. Laboratory Methods in Systematic Olericulture. A laboratory course covering the taxonomy, anatomy, composition, quality, and uses of truck crop plants as a basis of their classification and standardization.

190-191-192. Special Problems. Problems based upon the work given in the preceding courses.

193-194-195. Horticultural Seminar. Reports and discussions of problems and investigational work.

INORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

1-2-3. General Inorganic Chemistry.

9-10. General Inorganic Chemistry.

11. Qualitative Chemical Analysis.

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

MATHEMATICS

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Placement tests.—In each of Courses 3, 4, 5, 6, and 8, students who fail to pass certain tests will be dropped from the course during the first two weeks. A student who is dropped from Course 4 or 6 or 8 must complete Course 3 or 5 before taking any other course in mathematics. A student dropped from Course 3 or 5 must pass Subfreshman Mathematics in the Extension Division before returning to Course 3 or 5.

3. Higher Algebra, Short Course.
4. Trigonometry, Short Course.
5. Higher Algebra.
6. Trigonometry.
7. College Algebra.
8. Commerce Algebra.

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

MILITARY SCIENCE AND TACTICS

Students who have completed the Basic Course, R.O.T.C. may be selected for advanced work by the professor of military science and tactics. Those who pursue the Advanced Course are required to sign an agreement with the government to continue the two years' course to completion. This includes attendance at a training camp, held normally during the summer following the first year's advanced work. The camp is conducted free of cost to the student, and in addition, while actually in camp, the student receives the pay prescribed for the seventh grade in the army. Students pursuing the Advanced Course are also furnished a special uniform and receive a fixed allowance per day. The total government compensation for the two years' advanced work amounts to something over $200. Students who satisfactorily complete the Advanced Course will be commissioned in the Officers' Reserve Corps of the United States Army. The University allows 18 credits for the two years advanced R.O.T.C. work.

1-2-3. First Year Basic Course R.O.T.C. Practical instruction in schools of soldier, squad, platoon, company, and battalion; ceremonies, rifle marksmanship, military courtesy, military hygiene and first aid, physical drill.

4-5-6. Second Year Basic Course R.O.T.C. Practical and theoretical instruction in schools of company and battalion; scouting and patrolling, musketry, interior guard duty, automatic rifle.

51-52-53. First Year Advanced Course R.O.T.C. Military sketching, military field engineering, machine guns, military law, rules of land warfare, command and leadership.

54-55-56. Second Year Advanced Course R.O.T.C. Command and leadership, infantry weapons (37-mm. gun, 3-inch trench mortar) administration, military history and National Defense Act, combat principles.

MUSIC

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Credit is offered to students in the College of Agriculture, Forestry, and Home Economics who may wish to elect work in the Department of Music. Nine credits may be obtained.

1-2-3. Harmony.
10-11-12. Organ.[1]
16-17-18. First Year Pianoforte.[1]
22-23-24. Violin.[1]
28-29-30. Voice.[1]
34-35-36. Other Orchestral Instruments.[1]
40-41-42. Orchestra.
43-44-45. University Choir.

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

ORGANIC CHEMISTRY

SCHOOL OF CHEMISTRY

51-52-53. Organic Chemistry.

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

PHYSICAL CHEMISTRY

SCHOOL OF CHEMISTRY

101-102-103. Physical Chemistry.
110. Physical Chemistry.

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

[1] For special fees for these courses and practice fees see bulletin of general information.

PHYSICAL EDUCATION FOR MEN

A physical examination is required of all new matriculants, and of all others using the department privileges, at the beginning of the year, and as often during their college course as their physical condition may indicate.

For a special four-year professional course in physical education and athletic coaching, see bulletin of the College of Education. Students interested in this course should consult the department before registering.

Not more than nine credits in courses in physical activities may be counted toward graduation.

1-2-3. Freshman Physical Education.
4. Freshman Hygiene. Required of all freshmen. 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 to promote the physical efficiency of the women students. It gives physical examination and advise to all on entrance, plans systematically to keep in close touch with them during their first two years of residence; conducts yearly consultations with, and examines when necessary, all upper-class students; gives courses in hygiene; organizes neuromuscular activity leading toward organic strength, nervous stability, conscious motor control, correct body mechanics, skill in handling the body and in physical recreation, and the development of that valuable social quality known as good sportsmanship; co-operates closely with the Women's Athletic Association in encouraging and organizing athletic sports; holds regular office hours for the purpose of consultation with all students who desire its advice.

Work in this department is required of all newly entering students (see Courses 1-2-3 and 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 41, 42, 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. Gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations.

4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of the personal health.
7-8. Sophomore Danish Gymnastics.
9. Sophomore Archery.
10-11-12. Sophomore Orthopedic and Individual Gymnastics.
13-14-15. Sophomore Interpretive Dancing.
16-17. Sophomore Games and Folk Dances.
18. Tennis.
19. Sophomore Hockey.
20. Sophomore Basket-Ball.
21. Sophomore Baseball.
22-23. Sophomore Elementary Swimming.
24. Sophomore Horeback Riding.
25-26. Sophomore Intermediate Swimming.
27. Sophomore Golf.
28-29. Sophomore Advanced Swimming.
30. Sophomore Life Saving and Water Sports.
31. Sophomore Skating.
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

3. Elements of Mechanics and Sound.
4. Elements of Mechanics Laboratory.
9. Acoustics.
23. Heat.
24. Heat Laboratory.
33. Optics.
34. Optics Laboratory.
43. Magnetism and Electricity.
44. Electrical Laboratory.

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

PHYSIOLOGY

MEDICAL SCHOOL

4. Human Physiology. Elementary Course. For academic, home economics, pharmacy, and other students. Lectures and demonstrations.
57. Physiologic Chemistry. Intermediate Course.
58-59. Human Physiology. Intermediate Course.
100-101. Physiologic Chemistry.

103. Physiology of Muscle, Nerve, Blood, Circulation, and Digestion.
104. Physiology of the Nervous System and Special Senses.

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

PLANT PATHOLOGY AND BOTANY

1. Plant Pathology. An introductory course in plant diseases. Lectures, laboratory, and reference. Not open to those who have completed 10.
7-8. Weeds and Grasses. Agricultural and applied botanical study of weeds and grasses with special reference to agricultural importance.
9. Weeds and Seed Testing. Detailed study of seed testing methods and seed legislation. Weed and crop seeds and weed plants studied with special reference to identification.
10. Forest Pathology. Diseases of forest and shade trees, and the rotting of timber. Symptoms, etiology, and control. Lectures, laboratory, and reference work. Not open to those who have completed 1.
12. Seed Problems. Special seed problems are assigned. Advanced work in seed testing methods.
105-106-107. Mycology. Morphology and taxonomy of fungi. Lectures, laboratory, and field work.
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 Cereal Crops. Detailed study of diseases of cereal crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work.
112. Diseases of Fruit Crops. Special study of diseases of fruit crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work. (Given in alternate years. Offered in 1928-29.)
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. Not offered in 1928-29.)
114. Advanced Forest Pathology. A detailed study of wood rots, including a study of the deterioration of wood products caused by fungi. Lectures, laboratory, and greenhouse work. (Given in alternate years. Not offered in 1928-29.)
116. Pathological Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work.
117. Diseases of Forage and Fiber Crops. Symptomatology, etiology, and methods of control. Lectures, laboratory, and field work. (Given in alternate years. Not offered in 1928-29.)

POLITICAL SCIENCE

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. American Government.
2. 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 importance and extent of the poultry industry, market products, principles of house construction, methods of care and management, feeding for egg production.
2. Poultry Judging. The origin, standard requirements, and common defects of the leading commercial standard breeds and varieties and determination of standard values by the score card and comparison methods.
4. Incubating and Brooding. Instruction and practice in incubation and brooding, selection of breeding stock and eggs for hatching, and feeding young chicks. Of practical value to teachers of agriculture and poultry raisers.
5. Advanced Poultry Judging. Practice in close selection for high egg production; for standard values of different color patterns and principal standard types; mating to produce high standard quality.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

3. Personal Hygiene and Elementary Sanitation.
4. Increasing the Span of Human Life.
52. Health Care of the Family. First aid; communicable diseases, their transmission and prevention; hygiene of infancy, maidenhood, maturity. The care of the sick room; observation and care of the patient. Elementary symptomatology. Arranged for students of home economics.
57. Health of Infant and Pre-school Child.
58. Maternal and Child Hygiene.
60. 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.
3. Psychology Applied to Daily Life.
4-5. Introductory Laboratory Psychology.
7. Introductory Laboratory Psychology.
9. Introduction to Animal Psychology.

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

PUBLICATIONS AND RURAL JOURNALISM

10-11-12. Agricultural Journalism. Intended for students who may wish to enter the field of agricultural journalism as a profession.
19. Publicity. For students planning careers in agriculture or some allied industry, in which the co-operation of the press will be needed.

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

RHETORIC

Rhetoric credits will not be granted officially until the close of the second quarter of the senior year.

Any instructor who finds that a student is deficient in English will submit the name of the student together with the evidence to the chairman of the Students' Work Committee. If the evidence warrants, the committee will send the student to the Section of Rhetoric for such additional work in English as is needed. This work the student must take, without credit, to validate his freshman and sophomore rhetoric credits.

Students whose work in the rhetoric courses shows at any time an inadequate knowledge of the conventions of English will be required to enter a class in elementary rhetoric.

1. Rhetoric I. Note taking, gathering and organizing material, oral and written exposition, paragraph structure, supplementary reading.
2. Rhetoric II. Sentence structure, diction, exposition, news articles, supplementary reading.
3. Rhetoric III. Description, narration, supplementary reading.
11. Argumentation. Gathering evidence, reasoning, briefing, formal and informal argument, persuasion, debating.
22. Public Speaking. (5-hour course.) A practical course in fundamentals of speech making.
23. Public Speaking. (3-hour course.)
24. Advanced Public Speaking. Types of audiences, persuasion, voice, extemporaneous speeches for special occasions.
26. Parliamentary Law. Theoretical study and practical usage in conduct of occasional and regular meetings of organizations. One hour lecture, one hour practice.

28. Play Production. A practical course for teachers in directing and producing plays. Each student required to produce a one-act play and to take a part in another.
31. Survey of English Literature I. Survey of English literature of the sixteenth, seventeenth, and eighteenth centuries.
32. Survey of English Literature II. Survey of English literature of the nineteenth century.
33. Modern Literature. Contemporary English and American writers.
34. Books and Reading. The selection of books and periodicals for the home library.

ROMANCE LANGUAGES

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

French

1-2. Beginning French.
3-4. Intermediate French.
20. Oral and Written French.
21-22-23. Survey of French Literature.
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.
68-69. Survey of Spanish Literature.

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

SOCIOLOGY AND SOCIAL WORK

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

1. Introduction to Sociology.
6. Social Interaction.
14. Rural Sociology.
45. Social Statistics.
55. Housing Problems.
60. Child Welfare.
100. Social Psychology.
110. Rural Organization.
112. The Rural Social Survey.
114. Rural Social Institutions.
116. The Newspaper As a Social Institution.
119. The Family.
120. Social Progress.
134. Legal Protection of the Child.

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 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. (Given in alternate years. Offered in 1928-29.)
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. (Given in alternate years. Not offered in 1928-29.)

VETERINARY MEDICINE

2-3-4. Comparative Anatomy and Physiology of Domestic Animals. A course in anatomy and physiology with special reference to the structures involved in conformation, circulation, respiration, digestion, and excretion. Recitation and lectures.
6. Physiology of Reproduction. A study of embryology, obstetrics, sterility; the common diseases associated with breeding animals; non-infectious diseases associated with digestion.
8. Veterinary Studies.[1] 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.

[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.

101-102. Advanced Anatomy of Domestic Animals. Advanced study of the structures involved in the type, conformation, and nutrition of the common farm animals. Dissection of farm animals, including a study of the osseous, muscular, and other principal anatomical structures. Limited to nine students.

103-104. Advanced Comparative Physiology. An advanced course in physiology of the domestic animals, including laboratory work with special emphasis on animal nutrition.

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

Courses in this department are closely correlated with those offered by the Division of Entomology and Economic Zoology of the College of Agriculture, Forestry, and Home Economics. For courses of that division, see page 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.

27. Technique.

46-47. Ornithology.

107. Protozoology.

117-118-119. Ecology of Insects.

125-126-127. Advanced Entomology.

139-140. Histology and Development of Insects.

144-145-146. Animal Parasites and Parasitism.

148-149-150. Histology and Organdology.

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

The Bulletin *of the* University *of* Minnesota

The College of Agriculture, Forestry, and Home Economics

Part II

Announcement of Program for the Year 1928-1929

Vol. XXXI No. 28 May 22 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 1928 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 21, Saturday, September 22, or Monday, September 24, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 24, will be subject to the usual penalty for late registration. See Penalty Fees, page 44 of the bulletin of general information.

During the week September 25 to 29, 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 21, in order to avoid the inconvenience and delay incident to the congestion on the last day.

Any applicants who have not taken the psychological and English tests must report on Friday, September 21, and take these tests before they will be enrolled for Freshman Week.

1928

JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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1929

JANUARY

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MARCH

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MAY

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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UNIVERSITY CALENDAR
1928-29

Fall Quarter

1928			
September	20	Thursday	Payment of fees closes, except for new students
September	21-24		Entrance examinations (for removal of entrance deficiencies)
			Registration of all new students entering the freshman class
September	24-28		Examinations for removal of conditions
			Physical examinations
September	24-29		Freshman Week
September	27-28		Registration days[1] for students with advanced standing and old students not previously registered
September	28	Friday	Payment of fees for new students closes
October	1	Monday	Fall quarter classes begin, 8:15[2] a.m.
			First term School of Agriculture begins
October	18	Thursday	Senate meeting, 4:30 p.m.
October	20	Saturday	Homecoming Day
November	6	Tuesday	Election Day; a holiday
November	12	Monday	A holiday; (November 11, Sunday, Armistice Day)
Nov. 28-Dec.	8		Ice Cream Operators' Short Course
November	29	Thursday	Thanksgiving Day; a holiday
December	6	Thursday	State Day Convocation
December	19-22		Final examination period
December	20	Thursday	Commencement Convocation
			Senate meeting, 4:30 p.m.
December	21	Friday	First term School of Agriculture closes
December	22	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	26	Wednesday	Payment of fees closes for all students in residence fall quarter[3]

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

1929			
January	2-4		Entrance examinations
Jan. 2-Feb.	13		Creamery Operators' Short Course
January	5	Saturday	Registration day[1] for new students
January	7	Monday	Christmas vacation ends, winter quarter classes begin, 8:15[2] a.m.
			Second term School of Agriculture begins
January	14-19		Farmers' and Homemakers' Week Short Course
Feb. 1-March	2		Advanced Creamery Operators' Short Course
February	12	Tuesday	Lincoln's Birthday: a holiday
February	21	Thursday	Charter Day Convocation
			Senate meeting, 4:30 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	20-23		Final examination period
March	21	Thursday	Commencement Convocation
			Payment of fees closes for all students in residence winter quarter[3]
March	21-23		Horticulture Short Course
March	23	Saturday	Winter quarter ends, spring vacation begins, 5:30 p.m.

Spring Quarter

March	25-27		Entrance examinations
March	27	Wednesday	Second term School of Agriculture closes
March	29	Friday	Good Friday; a holiday
March	30	Saturday	Registration days[1] for new students, 8:30 a.m.-3:00 p.m.
April	1	Monday	Spring vacation ends, spring quarter classes begin, 8:15[2] a.m.
April	3	Wednesday	Home Nursing Short Course begins
May	9-11		Editors' Short Course
May	14-17		Beekeepers' Short Course
May	15	Wednesday	Home Nursing Short Course closes
May	16	Thursday	Cap and Gown Day Convocation
			Senate meeting, 4:30 p.m.
May	30	Thursday	Memorial Day; a holiday
June	3-8		Boys' and Girls' 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.

June	12-15		Final examination period
June	15	Saturday	Spring quarter closes, 5:20 p.m.
June	16	Sunday	Baccalaureate service
June	17	Monday	Fifty-seventh annual commencement

Summer Quarter

June	18-19	Thursday	Summer Session first term begins, registration and payment of fees
June	20	~~Wednesday~~	Classes begin, 8:00 a.m.
July	4	Thursday	Independence Day; a holiday
July	27	Saturday	Registration and payment of fees for second term closes. First term closes
July	29	Monday	Second term classes begin
August	5-16		Forestry, Woodcraft, and Scouting Short Course
August	31	Saturday	Second term Summer Session closes

CURRICULA

Following is a summarized statement of the curriculum requirements for use in arranging registration. Detailed statements of the various curricula will be found in Part I of the bulletin.

TECHNICAL AGRICULTURAL CURRICULA

REQUIRED 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; Zool. 14-15-16; Bact. 41; Soils 4, 5.

Junior year.—Rhetoric 11 or 31, 22.

ELECTIVE COURSES

General Curriculum in Agriculture

Junior year.—Agr. Biochem. 15; Agr. Econ. 40; Agr. Eng. 12; Agron. 121, 123, 131, 132; An. Husb. 2-3, 8; Ent. 3; Hort. 6 or 32.

Senior year.—Agr. Econ. 141; Agr. Eng. 7; Agron. 102, 103; An. Husb. 5; Dy. Husb. 6, 101; Pl. Path. 1; Sociol. 14; Vet. 9-10.

General Curriculum in Agricultural Economics

Consult division for outline of curriculum.

Agricultural Education

Same as general curriculum in Agriculture omitting Agr. Biochem. 15, Agr. Eng. 7, 12, 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 curriculum in Agriculture omitting Agr. Biochem. 15, Agr. Econ. 141, Agron. 123, 132, Hort. 6 or 32, Vet. 9-10 and adding the following:

Junior year.—Agr. Eng. 5, 13, 14, 31; Agron. 122.

Senior year.—Agr. Econ. 142; Agr. Eng. 19, 24, 25, 37.

General Curriculum in Animal Husbandry

Same as general curriculum in Agriculture omitting Agr. Econ. 141, Agron. 121, 132, An. Husb. 8, Dy. Husb. 6, 101, Hort. 6 or 32, Sociol. 14, Vet. 9-10 and adding the following:

Junior year.—Agron. 122; 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, 12.

General Curriculum in Dairy Husbandry

Same as general curriculum in Agriculture omitting Agr. Econ. 141, Agr. Eng. 7, 12, Agron. 132, An. Husb. 8, Hort. 6 or 32, Vet. 9-10 and adding the following:

Junior year.—Agron. 101, 122, Dy. Husb. 2, 104; Sociol 1; Vet. 2, 3-4.

Senior year.—Agr. Econ. 110; Agr. Eng. 40; An. Husb. 105; Dy. Husb. 103, 105, 106.

General Curriculum in Dairy Products

Arrange with adviser on major-minor plan.

General Curriculum in Farm Management

Same as general curriculum in Agriculture omitting Agr. Econ. 141 and adding the following:

Junior year.—Agron. 101.

Senior year.—Agr. Econ. 50; Agron. 104.

General Curriculum in Horticulture

Same as general curriculum in Agriculture omitting Agr. Biochem. 15, Agr. Econ. 141, Agr. Eng. 12, Agron. 121, 123, 132, Dy. Husb. 6, 101, An. Husb. 2-3, 5, 8, Vet. 9-10 and adding the following:

Junior year.—Agr. Eng. 13 or 40; Agron. 121 or 123; Bot. 22; Hort. 21, 56, 135; Pl. Path. 112 or 113.

Senior year.—Agr. Econ. 142; Agr. Eng. 12 or Agron. 132; Hort. 93, 107, 110, 136, 193-194.

Landscape Gardening

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

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

Open Elective Curricula

In addition to the required subject courses a major of 24 to 36 credits may be chosen from one of the following groups: (a) 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. Eighteen credit hours of the remaining electives must be chosen from groups other than major and minor.

AGRICULTURAL SCIENCE

Freshman year.—Freshman lectures; Mil. Sci. 1-2-3; Phys. Ed. 4 or Prev. Med. 3; Zool. 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; Zool. 14-15-16 or Bot. 4-5-6; Bact. 41; Math. 5, 6, 7, or Modern Language 15 cred.; Rhet. 11, 22.

Junior and senior years.—Major sequence 24-36 cred.; minor sequence 18 cred. Minimum of 21 credits elective in applied or technical agriculture or in sciences fundamental thereto.

AGRICULTURAL ENGINEERING

(Professional Curriculum)

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, 133, 134; An. Husb. 8; 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.

AGRICULTURAL JOURNALISM

Freshman year.—Same as for Technical Agriculture curriculum substituting Engl. A-B-C for Rhet. 1-2-3.

Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2, 6, 8; Engl. 11-12; Jour. 13, 14-15; Psy. 1-6; Zool. 14-15-16.

Junior year.—Agr. Econ. 40, 90, 110-111; Jour. 51-52, 57, 69; Sociol. 1, 14.
Senior year.—Agr. Econ. 30, 135; Econ. 149; Jour. 75, 104, 191-192; Pub. and Rur. Jour. 10-11-12; Psy. 56.

AGRICULTURAL BUSINESS ADMINISTRATION

Freshman year.—Same as for Agriculture except that Math. 5 or 8 should be substituted for Agr. Eng. 9-10 or 11.
Sophomore year.—Mil. Sci. 4-5-6; Agr. Econ. 1, 2, 6, 8, 50; Econ. 20, 25-26; Psy. 1-6; Zool. 14-15-16.
Junior year.—Agr. Econ. 30, 40, 90, 110-111, 131, 141, 142; Bus. Adm. 51-52-53, 100, 141.
Senior year.—Agr. Econ. 135, 150, 170; Bus. Admin. 58, 71, 101-102, 139, 149.

FORESTRY

REQUIRED 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; Zool. 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 COURSES

GROUP I

Freshman year.—Freshman lectures; Phys. Ed. 1-2-3, 4; Inorg. Chem. 1-2-3 or 9-10; H.E. 3, 50-51, 70; Rhet. 1, 2, 3; Sociol. 1; Zool. 14-15.
Sophomore year.—Phys. Ed. 22; Agr. Biochem. 3-4; Agr. Eng. 23; Bact. 41; H.E. 15, 53, 80 or 81; Psy. 1-2; Rhet. 22.
Junior and senior years.—Agr. Econ. 1; H.E. 34, 35[1], 83, 85, 131, 170, 171; H.E. Ed. 40; Physiol. 4; Prev. Med. 52; Rhet. 11 or 31.

General Curriculum in Home Economics

Junior and senior years.—To those listed as required courses under Group I for freshman, sophomore, junior, and senior years add additional elective credits to total 189 quarter credit hours.

Curriculum in Foods and Nutrition

The same as those listed under Group I, adding the following:
Junior and senior years.—Ag. Econ. 126, An. Husb. 111 or H E. 75 and 179, 73, 173 or 175, 182 or 183, 186 or 187.

Curriculum in Textiles and Clothing

The same as those listed under Group I adding the following:
Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 17 or 18, 102, 115.

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

Curriculum for Dietitians

The same as those listed under Group I adding the following:

Junior and senior years.—Agr. Biochem. 2; Agr. Econ. 25; H.E. 60, 61, 63, 65, 73, 75, 79, 156, 163, 173, 175, 176, 179, 182.

Curriculum in Institution Management

The same as those listed under Group I, adding the following:

Junior and senior years.—Agr. Econ. 25, 126; Econ. 1, 161; H.E. 60, 61, 63, 65, 163, 182 or 183.

Teachers' Curriculum in Home Economics

Professional requirements: Ed. Psy. 55 or Agr. Ed. 11; Hist. of Ed. 1 or 5 or 101 or Ed. Ad. 65; H.E. Ed. 42,[1] 49, 143.

Teachers' Curriculum in General Home Economics

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 17 or 18, 150.

Teachers' Curriculum in Home Economics Extension

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 17 or 18, 44, 150.

Teachers' Curriculum in Foods and Nutrition

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—Agr. Econ. 126; H.E. 73, 173 or 175 or 75 and 179, 182 or 183, 186 or 187.

Teachers' Curriculum in Textiles and Clothing

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—Agr. Econ. 126; H.E. 11, 13, 17 or 18, 102, 115, 150.

Teachers' Curriculum in Related Art

To the professional requirements listed above and the courses listed under Group I add the following:

Junior and senior years.—H.E. Ed. 147 instead of H.E. Ed. 143; Art Ed. 4-5-6, 7-8-9, 29-30-31; H.E. 11, 13, 55, 57, 150, 152, 154.

[1] Offered jointly with the College of Education and leads to 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 the University Farm:

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

1928-29

AGRICULTURAL BIOCHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
2f	Quantitative Methods	VI, VII, VIII,			
	(5 cred.; jr., sr.; prereq., Inorg. Chem. 10 cred.)	IX	MWF	108BCh	Mr. Franke
3f-4w	Types of Carbon Compounds.....				
	(6 cred.†; soph., jr., sr.; prereq., Inorg. 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.....	I	MWF	113BCh	Mr. Sandstrom
	(Same as 3f-4w)				
	(Limited to 40)				
7f-8w	General Agricultural Biochemistry....				
	(10 cred.; soph., jr., sr.; prereq., Inorg. 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 (w)	MW	108BCh	
		VII, VIII, IX (s)	MF	108BCh	
15f	Principles of Animal Nutrition.....	III	TThS	116BCh	Mr. Palmer
	(3 cred.; jr., sr.; prereq., 7-8)				
101f-102w	Agricultural Quantitative Analysis...	VI, VII, VIII	MWF	208BCh	Mr. Bailey
	(6 cred.; jr., sr.; prereq., 7-8)				
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.....	Ar	Ar	Ar	Mr. Bailey, Mr. Willaman
	(1 cred.‡; jr., sr.; prereq., org. chem.)				
108s	Chemistry of Wheat and Wheat Products	I	MWF	116BCh	Mr. Bailey
	(3 cred.; jr., sr.; prereq., 3-4 or 7-8)				
110s	Flour Laboratory Methods.....	VI, VII, VIII, IX	MWF	202BCh	Mr. Bailey
	(3-5 cred.; jr., sr.; prereq., 101-102 or Technolog. Chem. 100-101-102)				
111f-112w	Biochemistry	III	MWF	113BCh	Mr. Gortner
	(6 cred.; sr.; prereq., Zool., 9 cred., org. chem.)	VI	Th	113BCh	
113f-114w-115s	Biochemical Laboratory Methods.....	VI, VII, VIII	T	202,	
	(6 cred.; sr.; prereq., quant. anal., parallel 111-112)	VII, VIII, IX	Th	208BCh	Mr. Sandstrom

† 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.

No.	Title	Hour	Day	Bldg.	Instructor
116w	Advanced Animal Nutrition.....	III	TTh	116BCh	Mr. Palmer,
	(3 cred.; jr., sr.; prereq., 15 and 111 or physiologic chem.)	II	Th		Miss Kennedy
117f,w,s	Laboratory Problems in Animal Nutrition	Ar	Ar	314BCh	Mr. Palmer, Miss Kennedy
	(3 cred.; jr., sr.; prereq., 116, instructor's permission)				
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)	I	MTWThF	204Da	Ar
	(5 cred.; soph., jr., sr.; no prereq.)				
1w	Principles of Economics I.....				
	(Same as 1f)				
	Sec. 1 (Agriculture)	I	MTWThF	204Da	
	2 (Forestry)	III	MTWThF	204Da	
1f,w,s	Principles of Economics I (Home Economics)	II(f,w)	MTWThF	~~206Da~~	204 Old Dairy
	(Same as 1f)	III(s)	MTWFS	206Da	
2w	Principles of Economics II (Agriculture)	I	TThS	206Da	Ar
	(3 cred.; soph., jr., sr.; prereq., 1)				
2s	Principles of Economics II.....				
	(Same as 2w)				
	Sec. 1 (Agriculture)	I	TThS	204Da	
	2 (Forestry)	II	MWF	204Da	
6s	Economic History of Agriculture.....	IV	MTWFS	204Da	Mr. Price,
	(5 cred.; prereq., 1 or parallel)				Mr. Hinrichs
7s	Natural Resources				
	(See Agron. 7)				
8s	Rural Economics	III	TThS	~~204Da~~	10 2 TTh.
	(3 cred.; soph., jr., sr.; prereq., 1)				
25f,w	Principles of Accounting.....				
	(4 cred.; soph , jr., sr.)				
	Lect.	II	MWF	304Da	Mr. Holt
	Lab.	Ar	Ar	Ar	
30f	Prices of Farm Products.....	II	TThS	204Da	Mr. Working
	(3 cred.; jr., sr.; prereq., 2)				
40f	Principles of Marketing Organization (Agriculture and Forestry).....	I	MWF	108Da	Mr. Price
	(3 cred.; soph., jr., sr.; prereq., 2†)				
40s	Principles of Marketing Organization				
	(Same as 40f)				
	Sec. 1 (Agr. and For.)	II	TThS	108Da	Mr. Price
	2 (H.E.)	VI	MWF	204Da	Mr. Price
47s	Marketing Accounting				
	(4 cred.; soph., jr., sr.; prereq., 25)				
	Lect.	II	TThS	204Da	Hr. Holt
	Lab.	Ar	Ar	Ar	

† Students may register for the home economics section who have completed Course 1.

No.	Title	Hour	Day	Bldg.	Instructor
50s	Farm Finance ..... (5 cred.; soph., jr., sr.; prereq., 2)	I	MTWThF	108Da	Mr. Black
90f	Agricultural Statistics ..... (5 cred.; soph., jr., sr.; prereq., 2)				
	Lect.	III	TThS	204Da	Mrs. Kittredge
	Lab.	Ar	Ar	Ar	
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)			107 Eng.	
	Sec. 1	I	MWF	~~204Da~~	Mr. Waite
	2	~~IV~~ II	MWF	~~108Da~~	
131w	Market Prices ..... (3 cred.; jr., sr.; prereq., 40)	III	TThS	206Da	Mr. Waite
135s	Methods of Price Analysis..... (3 cred.; sr.; prereq., 30, 90)	~~III~~ II - M.	~~TThS~~ Th W. 11:45	108Da 12:35 F.	Mr. Waite
140f	Marketing Organization: Staples.... (3 cred.; soph., jr., sr.; prereq., 40)	III	MWF	204Da	Mr. Price
141w	Marketing Organization: Dairy and Poultry Products ..... (3 cred.; jr., sr.; prereq., 40)	II	TThS	204Da	Mr. Price
142s	Marketing Organization: Fruits and Vegetables ..... (2 cred.; jr., sr.; prereq , 40)	III	MW	108Da	Mr. Price, Mr. Holt
143w	Marketing Organization: Livestock and Meats ..... 2 (~~3~~ cred.; jr., sr.; prereq., 40)	IV	TS	206Da	Mr. Price
144f	Co-operative Organization ..... (3 cred.; jr., sr.; prereq., 40)	III	TThS	206Da	Mr. Price, Mr. Holt
150s*	Advanced Farm Finance ..... (3 cred.; sr.; prereq., 50 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 1928-29			
191w	Advanced Agricultural Statistics..... (3 cred.; jr., sr.; prereq., 90)	IV	MWF	204Da	Mrs. Kittredge

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

AGRICULTURAL EDUCATION
COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
11f	Principles of Vocational Education.... (3 cred.; jr., sr.;† no prereq.)	III	MWF	202Ad	Mr. Jackson
11w,s	Principles of Vocational Education... (Same as 11f)	II	TThS	202Ad	Mr. Jackson
21f	Vocational Education ..... (3 cred.; jr., sr.; no prereq.)	III	TThS	202Ad	Mr. Mayne
41‡	Apprentice Teaching ..... (2 cred.; jr., sr.;§ prereq., 11)	Not offered in 1928-29			

* Offered on the Minneapolis campus.

† Offered only to those preparing to teach.

‡ 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.

No.	Title	Hour	Day	Bldg.	Instructor
42f,w,s	Supervised Teaching Experience..... (3 cred.; jr., sr.;† no prereq.)	Ar	Ar	Ar	Mr. Field, Mr. Lathrop, Mr. Nylin
64w,s	Survey of Agriculture..... (3 cred.; no prereq.)	Ar	Ar	Ar	Mr. Field and others
75w,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)	Ar	Ar	Ar	
131	Methods in Teaching High School Agriculture ..... (5 cred.; jr.,** sr.;† prereq., 2 hon. pts. in 41)	Not offered in 1928-29			
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
151	Organization and Management..... (5 cred.; sr.;† prereq., 11, 21)	Not offered in 1928-29			
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
181f	Teaching Agriculture ..... (5 cred.; jr. sr.;† prereq , 11)	III	MTWThS	Ar	Mr. Storm, Mr. Field, Mr. Lathrop, Mr. Nylin

† 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.

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

§ Offered only to those preparing to teach.

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

No.	Title	Hour	Day	Bldg.	Instructor
182w	Teaching Agriculture ..... (Same as 181f)	III	MTWThF	202Ad	
183s	Teaching Agriculture ..... (Same as 181f)	III	MTWThF	202Ad	
191f-192w-193s	Seminar in Agricultural Education... (6 cred.; sr.; prereq., 11 cred.)	Ar	Ar	Ar	Mr. Storm, Mr. Lathrop, Mr. Field

AGRICULTURAL ENGINEERING

No.	Title	Hour	Day	B'dg.	Instructor
3f,s	Mechanical Drawing ..... (2 cred.; no prereq.)	III, IV	MWF	303En	Mr. Jacobson
5f	Farm Building Construction..... (3 cred.; no prereq.)				
	Lect.	VII	WF	41En	Mr. White
	Lab.	VII, VIII, IX	M	48En	
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 ..... (3 cred.;‡ no prereq.)	III	MTWFS	103En	Mr. Brudwick
10w,s	Applied Mathematics ..... (2 cred.; prereq., 9)	II	TThS	215En	Mr. Brudwick
11f,w,	Applied Mathematics ..... (5 cred.; no prereq.)	III	MWF	215En	Mr. Neal
			TS	105En	Mr. Neal
12s	Field Machinery ..... (3 cred.; jr., sr.; no prereq.)				
	Lect.	I	MW	216En	Mr. Torrance
	Lab.	I, II	F		
13f	Gas Engines ..... (3 cred.; no prereq.)	VI, VII, VIII	TTh	216,37En	Mr. Torrance
13s	Gas Engines ..... (Same as 13f)	VI, VII, VIII	MF	216,37En	Mr. Torrance
14s	Elementary Farm Power..... (3 cred.; prereq., 13)	VI, VII, VIII	TTh	216,37En	Mr. Torrance
15f	Ignition and Carburetion..... (3 cred.; prereq., 13)				
	Lect.	III	MW	216En	Mr. Torrance
	Lab.	III, IV	F		
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	205En	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

‡ Course 10 must be completed before credit will be allowed.

No.	Title	Hour	Day	Bldg.	Instructor
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
24f	Agricultural Physics I.....				
	(4 cred.; foresters; prereq., 11, 23, or equiv.)				
	Lect.	III	MWF	101En	Mr. Romness
	Lab.	VI, VII, VIII	M or F	102En	
24w	Agricultural Physics I.....				
	(Same as 24f for students in agriculture)				
	Lect.	II	TThS	101En	Mr. Romness
	Lab.	VII, VIII, IX	W or F	103En	
25w	Agricultural Physics II.....				
	(4 cred.; foresters; prereq., 24)				
	Lect.	I	TThS	101En	Mr. Romness
	Lab.	VI, VII, VIII	T or F	102En	
25s	Agricultural Physics II.....				
	(Same as 25w for students in Agriculture)				
	Lect.	II	TThS	101En	Mr. Romness
	Lab.	VII, VIII, IX	W or F	103En	
28w	Land Clearing	I	TThS	103En	Mr. Thompson, Mr. Schwantes
	(3 cred.; jr., sr.; no prereq.)				
31w,s	Principles of Drainage	III	TThS	215En	Mr. Roe
	(3 cred.; no prereq.)				
34w	Household Mechanics	I, II	MWF	103En	Mr. Romness
	(4 cred.; prereq., 23 or equiv.)				
35s	Household Physics	I, II	MWF	101,103En	Mr. Stewart
	(4 cred.; prereq., 23 or equiv.)				
37s	Rural Sanitation	I	TThS	101En	Mr. Stewart
	(3 cred.; no prereq.)				
40f	Mechanical Training I.....	I, II	MWF	20,106En	Mr. Dent
	(3 cred.; no prereq.)				
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.....	I, II	MWF	20,106En	Mr. Dent
	(3 cred.; no prereq.)				
42w	Principles of Irrigation.....	IV	MWF	215En	Mr. Roe
	(3 cred.; no prereq.)				
67s	Farm Structures II.....	I, II	TThS	305En	Mr. White
	(3 cred.; jr., sr.; prereq., 7)				
101f	Drainage Engineering and Works....	I	MF		Mr. Roe
	(4 cred.; prereq., 25, 31, 134)	II, III, IV	MF	215En	

No.	Title	Hour	Day	Bldg.	Instructor
102s	Advanced Drainage Problems.....	Ar	Ar	Ar	Mr. Roe
	(3 cred.; sr.; prereq., 101)				
103s	Irrigation Engineering and Works...	I	MW		
	(4 cred.; prereq., 25, 42, 134)	II, III, IV	MW	215En	Mr. Roe
104w	Drainage Administration and Law...	Ar	Ar	Ar	Mr. Neal
	(3 cred.; prereq., 101)				
112s	Farm Building Problems.....	VI, VII, VIII	TTh	305En	Mr. White
	(3 cred.; sr.; prereq., 67)				
121w	Steam Boilers and Engines.....				
	(3 cred.; prereq., 25, 40)				
	Lect.	II	TTh	216En	Mr. Boss
	Lab.	VI, VII	F		
122f	Power Machinery				
	(4 cred.; prereq., 12, 13, 25)				
	Lect.	II	ThS	106En	Mr. Schwantes
	Lab.	VI, VII, VIII, IX	T	49En	
123s	Farm Power				
	(4 cred.; prereq., 14, 25)				
	Lect.	IV	TS	216En	Mr. Schwantes, Mr. Torrance
	Lab.	VI, VII, VIII, IX	T	49En	
126s	Selection of Farm Equipment.....				
	(3 cred.; prereq., 14, 122)				
	Lect.	III	MW	106En	Mr. Schwantes
	Lab.	III, IV	F	49En	
133w	Applied Electricity				
	(5 cred.; prereq., 28)				
	Lect.	III	MWF		
	Lab.	VI, VII, VIII	TTh	101En	Mr. Stewart
134s	Agricultural Hydraulics				
	(4 cred.; prereq., 25, M.&M. 25)				
	Lect.	II	TTh		
	Lab.	VI, VII	MF	101En	Mr. Stewart
136s	Experimental Physical Analyses.....				
	(5 cred.; jr., sr.; prereq., 25)				
	Lect.	IV	TS	101En	Mr. Stewart
	Lab.	VI, VII, VIII	MW or TTh†	103En	
141w	Land Clearing II.....	Ar	Ar	Ar	Mr. Thompson
	(3 cred.; prereq., 28)				

Courses 36, 111, 125, 135, and 150 not offered in 1928-29.

AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

No.	Title	Hour	Day	Bldg.	Instructor
1f,w	General Farm Crops	III, IV	MWF	100Ad	Mr. Wilson
	(3 cred.; no prereq.)				
7s	Natural Resources	II	MWF	~~Ar~~ 3rd H.H.	Mr. Boss, Mr. Black
	(3 cred.; jr., sr.; no prereq.)				
101s	Farm Management	II	TThS	118Ad	Mr. Pond, Mr. Hoverstad
	(3 cred.; jr., sr.; prereq., 1, Agr. Econ. 2)				

† May be taken any two of the afternoons listed.

No.	Title	Hour	Day	Bldg.	Instructor
102f	Farm Management: Organization ... (3 cred.; sr.; prereq., 1, Agr. Econ. 2, Soils 4)	II	MW	118Ad	Mr. Garey
	Sec. 1 Lab.	VI, VII	T	118Ad	
	2	II, III	F	Ar	
102w	Farm Management: Organization ... (Same as 102f)	I	MW	118Ad	Mr. Garey
		VII, VIII	Th	118Ad	
103w	Farm Management: Operation ..... (3 cred.; sr ; prereq., 102)	II	MW	118Ad	Mr. Garey
		VI, VII	T	118Ad	
103s	Farm Management: Operation ..... (Same as 103w)	I	MW	118Ad	Mr. Garey
		VII, VIII	Th	118Ad	Mr. Garey
104s	Types of Farming..... (3 cred.; sr.; prereq., 103)	~~II~~ VI	~~MWF~~ MWF	~~118Ad~~ 102 Ad.	Mr. Boss
121f	Grain Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. Wilson
122w	Grain and Hay Grading..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	Mr. Wilson
123s	Forage Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.)	VI, VII, VIII	TTh	100Ad	
124s	~~Special Crops~~ Problems in Farm Crops ..... (3 cred.; jr., sr.; prereq., 1, Bot. 9 cred.) 121 & 123 or parallel.	VI, VII-	MWF	100Ad	Mr. Wilson
125w,s	Advanced Farm Crops..... (3 cred. per qtr.; sr.; prereq., Bot. 127, and 142 or 143, Soils 4, 5) Game.	Ar	Ar	Ar	Mr. Arny, Mr. Wilson
131f,w	Principles of Genetics ..... (3 cred.; soph., jr., sr.; prereq., Bot. or Zool. 9 cred.)				
	Lect.	I	ThS	102Ad	Mr. Stevenson
	Lab.	I, II	T	102Ad	Mr. Stevenson
132w	Farm Crops Plant Breeding..... (3 cred.; jr., sr ; prereq., 131)	VI, VII, VIII	TTh	102Ad	Mr. Stevenson
134f,w	Laboratory Problems in Genetics.... (2 cred.; jr., sr.; prereq., 131 or parallel)	Ar	Ar	Ar	Mr. Brewbaker

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w	Types and Breeds of Livestock..... (6 cred.; soph., jr., sr.; prereq., 10-11)	I, II	MWF	WSt	Mr. 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. Anderson

No.	Title	Hour	Day	Bldg.	Instructor
9s	Pedigrees and Herd Books.....	II	TThS	3St	Mr. Anderson
	(3 cred.; jr., sr.; prereq., 5)				
10f-11w	Types and Market Classes of Livestock				
	(6 cred.; no prereq.)				
	Sec. 1	I, II	MWF	CSt	Mr. Harvey
	2	I, II	TThS	CSt	
15s	Fundamentals of Livestock Production	I	TThS	WSt	Mr. Peters
	(3 cred.; jr., sr. in prof. Agr. Eng.; no prereq.)				
101f	Advanced Stock Judging.....	VI, VII	MWF	CSt	Mr. Ferrin
	(3 cred.; sr.; prereq., 4)				
102s	Horse Husbandry				
	(3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	II	TTh	WSt	Mr. Harvey
	Lab.	VI, VII, VIII	F	CSt	
103s	Beef Cattle Husbandry.....				
	(3 cred.; jr., sr.; prereq., 5, 6)				
	Lect.	III	MW	WSt	Mr. Peters
	Lab.	VI, VII, VIII	T	BB	
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	VI, VII, VIII	WF	MS	Mr. Anderson
	(3 cred.; jr., sr.; prereq., 7)				
107s	Meat Problems				
	(3 cred.; sr.; prereq., 106)				
	Lect.	IV	TS	MS	Mr. Anderson
	Lab.	VI, VII, VIII	W	MS	
108f-109w-110s	Seminar	II	F	3St	Mr. Peters
	(3 cred.; jr., sr.; prereq., 2-3)				
111w	Utilization of Meats.....	III	MW	MS	Mr. Anderson
	(3 cred.; Home Econ. students; no prereq.)	III, IV	F	MS	

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.

* Offered on the Minneapolis campus.

ART EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*†	Fundamental Principles of Design...				
	(9 cred.; no prereq.)				
	Sec. 1 Lect.	II	TThS	404F	Miss Clousing
	Lab.	III	TThS	404F	
	Sec. 2 Lect.	III	TThS	404F	Mrs. Hanley
	Lab.	IV	TThS	404F	
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	Miss Clousing
	2	II, III	F	401F	
	3	III, IV	W	401,402F	Mrs. Hanley
10f-11w-12s*	Composition				
	(3 cred.; no prereq.)				
	Sec. 1	II, III	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
	3	III, IV	F	401F	Miss Raymond

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

BACTERIOLOGY AND IMMUNOLOGY

MEDICAL SCHOOL

spring III IV MWF

No.	Title	Hour	Day	Bldg.	Instructor
41f,w,s*	General Bacteriology	~~VII, VIII, IX~~	MWF	Ar	
	(5 cred.; soph , jr., sr.; prereq., chem and biol.)				
103w*	Soil Microbiology	I, II, III	TS	MH	Dr. Skinner
	(5 cred.; jr., sr.; prereq., 41) and	I, II	Th	MH	
121w	Industrial Bacteriology	I, II	TTh	Ar	Ar
	(3 cred.; jr., sr.; prereq., 41)				
122s*	Industrial Bacteriology (cont'd).....	I, II	TTh	MH	Ar
	(Same as 121)				

For additional courses see the bulletin of the Medical School.

* 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.

+ qtrs in Chem.

BEE CULTURE

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

carry

4s. Adv. Beekeeping I arr. 203 a.

BOTANY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f*	General Botany ..... (4 cred.; students in Agr. and For.)				
	Lect.	VI	TTh	BotAud	Mr. Huff
		VII	T		
	Quiz Sec.	VII	Th		
1s*	General Botany ..... (4 cred.; students in H.E.; no prereq.)				
	Lect.	III	TThS	BotAud	Mr. Huff
	Quiz Sec. 1	I	M		
	2	II	T		
	3	III	W		
	~~4~~	~~IV~~	~~F~~		
	~~5~~	~~VI~~	~~M~~		
	6	VII	T		
	~~7~~	~~VIII~~	~~W~~		
3su	Forest Botany ..... (1½ cred.; no prereq.)	Given at Itasca Park			Mr. Rosendahl
7f,w*	Taxonomy of Flowering Plants ..... (3 cred.; prereq., 1)	I, II	MWF	1,4,5,8Bot	Mr. Rosendahl

1w. (see S.L.A. II)

Same.

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

CHILD WELFARE INSTITUTE

No.	Title	Hour	Day	Bldg.	Instructor
40w*	Child Training (See also H.E. Ed. 40) (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV	MWF	206aP	Mrs. Foster
~~50w-51s*~~	~~Nursery School Methods..... (6 cred.; jr., sr.; prereq., 40 or 60, 6 cred. in psy., or ed.)~~	~~VI~~	~~MWF~~	~~114F~~	~~Mrs. Foster~~
52f-53w-54s*	Nursery School Technique..... (6 cred.; jr., sr.; prereq., 50-51 and permission of instructor)	Ar	Ar	105CWI	Mrs. Foster

carry.

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
60f*	The Nursery School and Parental Education Movement ..... (2 cred.; jr., sr.; prereq., 6 cred. in psy. or ed.)	VI	TTh	110P	
120s*	Health Care of Young Child..... (2 cred.; sr.; prereq., 50-51 and permission of instructor)	~~Ar~~ VI	T. Th. 202. A. Grow ~~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	110OL	Mr. Anderson
133f-134w-135s*	Observation and Experimental Methods in Study of Young Child..... (6 or 9 cred.; sr.; prereq., 10 cred in psy. or ed. psy., incl. 1 lab. course, or equiv., permission of instructor)	VI VI, VII	M WF	301Lib	Miss Goodenough
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	
173w-174s*	Technique and Practice of Parental Education ..... (6 cred.; sr., grad.; prereq., 170 and permission of instructor)	Ar	Ar	100CWI	
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)	III	TTh	201CWI	Miss Goodenough

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. 41) (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 VI, VII, VIII	MW Th	210HH	Mr. Macy

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
103w	Dairy Stock Feeding..... (3† cred.; sr.; prereq., 101, Agr. Biochem. 15)	III	MWF	210HH	Mr. Eckles
104s	Advanced Study of Dairy Breeds.... (3 cred.; jr., sr.; prereq., 6, 101)	VI, VII, VIII VI	MW F	210HH 210HH	Mr. Schaefer 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 VI, VII, VIII	MW F	210HH	Mr. Combs, Mr. Thurston
112s	Dairy Products II..... (3 cred.; jr., sr.; prereq., 1, 2)	IV VI, VII, VIII	TS T	210HH 210HH	Mr. Combs, Mr. Coulter Mr. Combs, 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.....	(See bulletin of Summer Session)			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 College of Education.

EDUCATIONAL PSYCHOLOGY

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
55f,w,s*	Educational Psychology ..... (3 cred.; jr., sr.; prereq., Psy. 6 cred.)	I	MWF	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.

* Offered on the Minneapolis campus.

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

ENTOMOLOGY AND ECONOMIC ZOOLOGY

No.	Title	Hour	Day	Bldg.	Instructor
3f,w	Economic Entomology ..... (3 cred ; soph., jr., sr.; prereq, Zool. 16)	VI, VII, VIII	WF	301Ad	Mr. Ruggles
4w	Economic Vertebrate Zoology..... (3 cred.; soph., jr., sr.; prereq, Zool. 16)	Ar	Ar	Ar	Mr. Johnson
6w	Forest Protection Against Insects.... (3 cred.; soph., jr., sr.; prereq, Zool. 16)	VI, VII, VIII	MTh	301Ad	
8f	Varieties and Habits of Fur Bearing Animals ..... (3 cred.; soph., jr., sr.; prereq, Zool. 9 cred.)	Ar	Ar	Ar	Mr. Johnson
37f-38w-39s*	General Entomology ..... (9 cred.; soph., jr., sr.; prereq., Zool. 9 cred.)	I, II	MWF	212AB	
~~44s*~~	~~Introductory Course in Animal Parasites and Parasitism.....~~ (~~3 cred.; soph., jr., sr.; prereq, Zool. 9 cred.~~)	~~VI, VII, VIII~~	~~WF~~	~~212AB~~	~~Mr. Riley~~ dropped. see grad. 24f.
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	History and Development of Insects.. (6 cred.; jr., sr.; prereq., 37-38-39 or equiv.)	II, III, IV II, III	T Th	302Ad 302Ad	Mr. Riley
		One additional hour to be arranged.			
144f-145w-146s*	Animal Parasites and Parasitism..... (3 to 9 cred.; jr., sr.; prereq., Zool. 9 cred.)	VI, VII, VIII	WF	212AB	Mr. Riley
175f-176w	Advanced Economic Entomology..... (6 cred.; sr.; prereq., 3 or 6, Zool. 117-118-119)	I	MWF	302Ad	Mr. Ruggles, Mr. Wardle
177s	Insecticides and Their Action..... (3 cred.; sr.; prereq., 3 or 6, Zool. 117-118-119)	I	MWF	302Ad	Mr. Strand
185f,w,s	Physical Entomology ..... (3 cred.; sr., grad.; prereq., permission of instructor)	Ar	Ar	Ar	Mr. Robinson
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. Wardle, Mr. Mickel, Mr. Strand, Mr. Robinson

* Offered on the Minneapolis campus.

FORESTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f	General Forestry ..... (3 cred.; no prereq.)	I	TThS	102Hr	Mr. Cheyney
2su	Field Dendrology ..... (1½ cred.; no prereq.)	Given at Itasca Park			Mr. Wentling
3w	Dendrology ..... (3 cred.; no prereq.)	III	MWF	301Hr	Mr. Schmitz
4s	Dendrology ..... (4 cred.; no prereq.)				
	Lect.	III	MWF	301Hr	Mr. Schmitz
	Lab.	II, III	S	301Hr	Mr. Rees
5su	Field Silviculture ..... (1½ cred.; no prereq.)	Given at Itasca Park			Mr. Cheyney
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 ..... (1½ cred.; no prereq.)	Given at Itasca Park			Mr. Allison, Mr. Brown
13s	Forest Mensuration Laboratory..... (2 cred.; jr., sr.; prereq., 7-8)	Given at Cloquet			Mr. Hansen
20w	Grazing ..... (3 cred.; soph., jr., sr.; no prereq.)	II	TThS	301Hr	Mr. Allison
23†	Factory Experience ..... (3 to 5 cred.; jr., sr.; prereq., 33-34)	Ar	Ar	Ar	
27w	Farm Wood Lots and Windbreaks... (3 cred.; no prereq.‡)	IV	MWF	301Hr	Mr. Cheyney
28w	Logging ..... (3 cred.;¶ jr., sr.; prereq., 7-8)	III	MWF	201So	Mr. Brown
29f	Sawmill and Woodworking Machinery (3 cred.; soph., jr., sr.)	IV	MWF	302Hr	Mr. Cheyney
30s	Wood Seasoning ..... (3 cred.; jr., sr.; prereq., 33-34)	I	TThS	301Hr	Mr. Wentling
31s	Logging Laboratory ..... (1 cred.; jr., sr.; prereq., 28)	Given at Cloquet			Mr. Brown
33f-34w	Wood Structure and Identification... (6 cred.; jr., sr.; prereq., 3-4)	VI, VII, VIII	WF	303Hr	Mr. Wentling
37w	Forest Protection ..... (3 cred.; jr., sr.; prereq., 127)	III	MWF	302Hr	Mr. Hansen
48w	Forest Products ..... (3 cred.; no prereq.)	I	TThS	102Hr	Mr. Rees
50s	House and Furniture Woods..... (2 cred.;‡ soph., jr., sr.; no prereq.)	III, IV	TS	303Hr	Mr. Rees
101w	Advanced Dendrology ..... (3 cred.; jr., sr.; prereq., 3-4)	I	TThS	301Hr	Mr. Rees
107f	Uses of Wood I..... (3 cred.; sr.; prereq., 33-34)	IV	MWF	301Hr	Mr. Wentling

† 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.

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	Th	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)	II	MWF	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. Rees
119w	Advanced Wood Structure I..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	TTh	303Hr	Mr. Rees
120s	Advanced Wood Structure II..... (3 cred.; sr.; prereq., 33-34)	VI, VII, VIII	WF	303Hr	Mr. Rees
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)	IV	MWF	301Hr	Mr. Schmitz
126f	Silvics ..... (3 cred.; jr., sr., prereq., 3-4)	IV	TThS	301Hr	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
129f	American Silvicultural Practice..... (3 cred.; jr., sr.; prereq., 127)	III	TThS	301Hr	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	302Hr	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	201So	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

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

GEOLOGY AND MINERALOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*†‡	General Geology				
	(10 cred.; all; no prereq.)				
	Sec. 1 Lect.	I	TThFS	210P	Mr. Thiel
	Lab.	I, II or VI, VII	MW	212P	
	2 Lect.	VII	MTWTh	110P	Mr. Allison
	Lab.	VI, VII	TTh	212P	
1f-3w*†‡	General Geology				
	(Same as 1f-2w)				
	Lect.	III	TThFS	110P	Mr. Emmons
	Lab.	III, IV or	MW	212P	
		VI, VII	TTh	212P	
1w-2s*†‡	General Geology				
	(Same as 1f-2w)				
	Lect.	IV	MTWF	110P	Mr. Allison
	Lab.	VI, VII	TTh	212P	
1w-3s*†‡	General Geology				
	(Same as 1f-2w)				
	Lect.	II	MWFS	206P	Mr. Allison,
	Lab.	I, II	TTh	212P	Mr. Emmons
1s-2f*†‡	General Geology				
	(Same as 1f-2w)				
	Lect.	III(s)	MWThF	110P	Mr. Emmons
	Lab.	III, IV(s)	TS	212P	
	Lect.	III(f)	MWThF	110P	Mr. Allison
	Lab.	III, IV(f)	TS	212P	
8f,w,s*§	Introductory Geology				
	(5 cred.; all; no prereq.)				
	Sec. 1	II	MWThFS	210P	Mr. Thiel
	~~2 (s)~~	~~IV~~	~~MTWFS~~	~~210P~~	
23w*	Elements of Mineralogy.....				
	(5 cred.; jr., sr., prereq., chem.)				
	Lect.	II VIII	WF T	110P	Mr. Gruner
	Lab.	III IV.	~~WF~~	100P T.S. or VII VIII W.F.	
	(See program of School of Mines and Metallurgy for additional sections.)				
24s*	Elements of Mineralogy.....				
	(Same as 23w)				
	Lect.	II	MWF	206P	Mr. Gruner
	Rec.	IX	T		
	Sec. 1 Lab.	VII-VIII	M	100P	
		VI-VII	T		
	2	III-IV	M		
		VII-VIII	F		
25f*	Elements of Mineralogy.....				
	(Same as 23w)				
	Lect.	I	MWF	210P	Mr. Gruner
	Rec.	VIII	F		
	Sec. 1 Lab.	VI-VII	MW		
	2	VII-VIII	T		
		VI-VII	F		
20f*†	General Physiography	III	MTThFS	208P	
	(5 cred.; soph., jr., sr.; no prereq.)				

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

* Offered on the Minneapolis campus.

† The entire course must be completed before credit is given for any quarter.

‡ Course 2 may be followed by 3, 4, or 11; or 3 by 2, for a three-quarter sequence.

§ Not open to students with credit in Geol. 1 or 29.

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 ..... (Same as 1f)	II	MTWThF	210OL	Miss Alexander
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 ..... (Same as 3f)	III	MWF	210OL	Mr. Finney
5s	Public Education in the United States (3 cred.; jr., sr.; prereq., 6 cred. in psy.)	VIII	MWF	106HE	Miss Alexander

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
	(Limited to 24 each) 2	III, IV	MTWFS	311,307HE	Miss Phelps
3s	Textiles ..... sec 2 (fall) (Same as 3f,w) (Limited to 24)	I, II	MTWThF	311,307HE	Miss Weller, Miss Little
4f,s	Textiles (S. L. and A)..... (3 cred.; no prereq.; not open to students in H.E.) (Limited to 24)	VI, VII	MWF	311,307HE	Miss Weller, Miss Little
11f,s	Clothing Planning and Construction, A (3 cred.; no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss Little, Miss Sell, Miss Gorham
	(Limited to 24 each) 2	I, II	TThS	304HE	Miss Little, Miss Gorham
	3	VI, VII, VIII	TTh	304HE	Miss Gorham, Miss Sell
11w	Clothing Planning and Construction, A (Same as 11f,s)				
	Sec. 1	I, II	MWF	304HE	Miss Little
	(Limited to 24 each) 2	VI, VII, VIII	TTh	304HE	Miss Gorham

* Offered on the Minneapolis campus.

† Not open to students with credit in Geol. 1.

No.	Title	Hour	Day	Bldg.	Instructor
13f,s	Clothing Planning and Construction, B (3 cred.; prereq., 3, 11 or equiv., 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.; 3d qtr. fr., soph., jr.; prereq., 3, 51)				
	Lect.	II	S		
		VI	Th		
	Lab.	VI, VII, VIII	T	313HE	Miss Weller, Miss Gorham
17w	Advanced Clothing ..... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)	III, IV	MWF	305HE	Miss Gorham, Miss Carlotta Brown
17s	Advanced Clothing ..... (Same as 17w)				
	~~Sec. 1~~	~~III, IV~~	~~MWF~~	~~305HE~~	~~Miss Gorham~~
	(Limited to 24 each) 2	I, II	TThS	305HE	Miss Carlotta Brown
18f,s	Commercial Clothing Manufacture.... (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 15)	VI, VII, VIII	MWF	305HE	Miss Gorham
34f,w	Home Management: Operation and Maintenance, Lectures ..... (3 cred.; jr., sr.; prereq., 35, parallel, 83, Agr. Econ. 1 or parallel, Prev. Med. 52 or parallel)	VIII	MWF	203HE	Miss Studley, Miss Whiteside
35f,w,s	Home Management: Operation and Maintenance, Laboratory ..... (6 cred.; jr., sr.; prereq., 83, home pract. 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	MW	213HE	Miss Newton
		4 consecutive hours to be arranged.			
50f,w	Color and Design I..... (3 cred.; no prereq.)				
	Sec. 1	I, II(f)	MWF	402HE	Miss V. Goldstein
	(Limited to 20 each)	III, IV(w)	MWF	402HE	Miss V. Goldstein
	2	I, II	TThS	402HE	Miss H. Goldstein
	3	III, IV(f)	MWF	402HE	Miss Kendall
50s	Color and Design I..... (Same as 50f,w)				
	Sec. 1	I, II	TThS	402HE	Miss H. Goldstein
	(Limited to 20 each) 2	VI, VII	MWF	112HE	Miss Topp

No.	Title	Hour	Day	Bldg.	Instructor
51f	Color and Design II..... (3 cred.; all; prereq., 50)				
	Sec. 1	I, II	MWF	401HE	Miss V. Goldstein
	(Limited to 20 each) 2	I, II	TThS	401HE	Miss V. Goldstein
51w	Color and Design II..... (Same as 51f)				
	Sec. 1	III, IV	MWF	401HE	Miss V. Goldstein
	(Limited to 20 each) 2	I, II	TThS	401HE	Miss V. Goldstein
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 V. Goldstein
53f	Advanced Design ..... (3 cred.; soph., jr., sr.; prereq., 51, or 56) (Limited to 20)	VI, VII	MWF	402HE	Miss Kendall
53w,s	Advanced Design ..... (Same as 53f,s)				
	Sec. 1 (w)	VI, VII	MWF	402HE	Miss H. Goldstein
	(Limited to 20 each) 2 (s)	I, II (w)	MWF	402HE	Miss Kendall
		III, IV (s)	MWF	402HE	Miss Kendall
55f	Decorative Needlework and Other Crafts ..... (3 cred.; prereq., 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 H. Goldstein
57s	Batik and Other Crafts..... (3 cred.; prereq., 3, 53 or parallel) (Limited to 20)	VI, VII, VIII	TTh	110HE	Miss Topp
60s	Institution Marketing ..... (2 cred.; jr., sr.; prereq., 61 or parallel, 85)	III	WF	106HE	Miss Dunning
61f,s	Quantity Cookery ..... (4 cred.; 3d qtr. soph., jr., sr.; prereq., 83)				
	(Limited to 15) Lect.	I	S	106HE	Miss Dunning
	2 Lab.	I, II, III	TTh	DiH	
61w	Quantity Cookery ..... (Same as 61f,s)				
	Lect.	I	S	106HE	Miss Dunning
	Sec. 1 Lab.	I, II, III	TTh	DiH	
	(Limited to 15) 2	VI, VII, VIII	MW	DiH	

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

No.	Title	Hour	Day	Bldg.	Instructor
63f,w,s	Institution Experience ..... (3 cred.; 3d qtr. soph., jr., sr.; prereq., 61 or parallel, 83)				
	(Limited to 12) Lect.	IV	T	Ar	Miss Dunning
	Lab.	4 hrs. to be arranged on MWF during IV & V hrs.			Miss K. McFarland
	Note: w qtr lab work. M.W.F.				
65w	Institution Equipment ..... (2 cred.; jr., sr.; prereq., 61 or parallel, 63 or parallel)				
	Lect.	III	W		Miss Hunt
	Lab.	III, IV	F		
70f	Nutrition Survey ..... (2 cred.; no prereq.)	IV	WF	203HE	Miss Biester
70w	Nutrition Survey ..... (Same as 70f)	III	TTh	213HE	Miss Counts
70s*	Nutrition Survey ..... (Same as 70f)	VII	TTh	Ar	Miss Counts
73f	Nutrition I ..... (4 cred.; soph.,§ jr., sr.; prereq., Agr. Biochem. 4, H.E. 80 or 81, Physiol. 4) (Limited to 24)	VI, VII, VIII	MWF	211,213HE	Miss Counts, Mrs. Furnas
73s	Nutrition I ..... (Same as 73f) (Limited to 24)	VI, VII, VIII	MWF	211,213HE	Miss Counts, Mrs. Furnas
75f	Dietetics Laboratory ..... (2 cred.; jr., sr.; prereq., 170 or equivalent, or parallel)	III, IV	MW	107HE	Miss Hunt
79s	Selected Problems for Dietitians..... (3 cred.; sr.; prereq., 170 or equivalent)	VI	MWF	313HE	Miss Biester
80f	Foods and Cookery..... (5 cred.; prereq., Agr. Biochem. 3, parallel 4)	I, II	MTWThF	209HE	Miss Kolshorn
80w,s	Foods and Cookery..... (Same as 80f)				
	Sec. 1	VI, VII	MTWThF	209HE	Mrs. Aamodt, Mrs. Niles
	(Limited to 20 each) 2	III, IV	MTWFS	209HE	Mrs. Aamodt, Mrs. Niles
81w	Foods and Cookery..... (3 cred.; soph., jr., sr.; by examination; prereq., same as 80f) (Limited to 20)	VIII, IX	MWF	207HE	Miss Kolshorn
83f,w	Food Management ..... (3 cred.; soph., jr., sr.; prereq., 80 or 81) (Limited to 20)	III, IV	MWF	203,207HE	Miss Kolshorn
83s	Food Management ..... (Same as 83f,w)				
	Sec. 1	III, IV	MWF	203,207HE	Miss Kolshorn
	(Limited to 20 each) 2	VI, VII VIII	~~MWF~~ T.Th.	203,207HE	Mrs. Niles

*Offered on the Minneapolis campus.

§ Open to sophomores only in their third quarter.

No.	Title	Hour	Day	Bldg.	Instructor
85f,w	Food Marketing ..... (2 cred.; prereq., Agr. Econ. 1 or parallel)	VI VI, VII, VIII	T Th	207,203HE	Miss Kolshorn Miss Kolshorn
85s	Food Marketing ..... (Same as 85f,w)				
	Sec. 1	VI VI, VII, VIII	T Th	207,203HE	Miss Kolshorn, Mrs. Niles
	2	II I, II, III	T Th	207,203HE	Miss Kolshorn, Mrs. Niles
89s	Camp Cookery ..... (2 cred.; no prereq.; not open to students in H.E.)	Not offered in 1928-29			
102f	Advanced Textiles ..... (3 cred.; jr., sr.; prereq., 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel) (Limited to 16)	~~VI, VII, VIII~~	TTh	~~307,311~~ 304 HE	Miss Phelps
107w	Textile Analysis and Related Problems (3 cred.; jr., sr.; prereq., 102, Agr. Biochem. 2)	VI, VII, VIII	MWF	311HE	Miss Phelps
115f,w	Clothing Economics ..... (2 cred.; jr., sr.; prereq., 13, Agr. Econ. 1)	III	TTh	203HE	Miss Weller
131f	Home Management: House Planning and Equipment ..... (5 cred.; jr., sr.; prereq., 53) (Limited to 20)	III, IV	MTWFS	401HE	Miss Morse
131w,s	Home Management: House Planning and Equipment ..... (Same as 131f) (Limited to 20)	VI, VII	MTWThF	401HE	Miss Morse
136s	Budget Problems ..... (3 cred.; sr.; prereq., 34, 35, 170, Agr. Econ. 126 parallel)	Ar	Ar	Ar	Miss Studley
150f,w,s	Art History and Appreciation..... (3 cred.; jr., sr.; prereq., 51 or equivalent)	VIII	MWF	313HE	Miss H. Goldstein
~~152w~~	~~Advanced Interior Design..... (3 cred.; jr., sr.; prereq., 53, 131, 150)~~	~~I, II~~	~~MWF~~	~~401HE~~	~~Miss Morse~~ Cancel
154s	Advanced Costume Design..... (3 cred.; jr., sr.; prereq., 13, 53, 55 recommended)	I, II	TThS	112HE	Miss H. Goldstein
156f,w,s	Hospital Social Service..... (3 cred.; jr., sr.; prereq., 170 or parallel, 175) (Limited to 8)	VI, VII, VIII 3 hrs. to be arranged	TTh	~~Ar~~ 315 M.H.	Miss Tebbets, Miss Hunt
163s	Institution Management Problems... (3 cred.; sr.; prereq., 61, 63)				
	Lect.	III	TTh	106HE	Miss K. McFarland
	Lab.	III, IV	S	DiH	
170f,w	Nutrition of the Family..... (3 cred.; jr., sr.; prereq., 80 or 81, Agr. Biochem. 4, Physiol. 4)	I	MWF	203HE	Miss Counts, Miss Hunt
170s	Nutrition of the Family..... (Same as 170f,w)	II	MWF	203HE	Miss Counts

No.	Title	Hour	Day	Bldg.	Instructor
171f,w,s	Child Nutrition ..... (3 cred.; jr., sr.; prereq., 170 or parallel, H.E. Ed. 40) (Limited to 16)				
	Lect.	III	MWF	213HE	Miss Leichsenring
	Lab.	IV	Ar before completing registration		Miss Mattson
173s	Nutrition in Disease ..... (3 cred.; sr.; prereq., 170, 175)				
	Lect.	VII	MWF	213HE	Miss Hunt
175f	Nutrition II ..... (4 cred.; jr., sr.; prereq., 73) (Limited to 24)	I, II	MTWTh	211,213HE	Miss Counts, Mrs. Furnas
175w	Nutrition II ..... (Same as 175f) (Limited to 24)	VI, VII, VIII	MWF	211,213HE	Miss Counts
176w	Advanced Nutrition ..... (4 cred.; jr., sr.; prereq., 73, Agr. Biochem. 2) (Limited to 15)				
	Lect.	IV	T	313HE	Miss Biester
	Lab.	I, II, III	TThS	311HE	Mrs. Furnas
177s	Digestion and Metabolism..... (3 cred.; sr.; prereq., 175)	VI, VII, VIII	TTh	213HE	Miss Leichsenring
179w	Readings in Nutrition..... (2 cred.; jr., sr.; prereq., 170)	IV	MW	213HE	Miss Biester, Miss Counts
179s	Readings in Nutrition ..... (Same as 179w)	I	TTh	213HE	Miss Counts
182f,w,s	Experimental Cookery ..... (3 cred.; jr., sr.; prereq., 80) (Limited to 12)	VI, VII	MWF	107HE	Miss Child
183f,w,s	Experimental Cookery ..... (5 cred.; jr., sr.; prereq., 80)	VI, VII	MTWThF	107HE	Miss Child
186f,s	Special Food Problems..... (3 cred.; sr.; prereq., 182)	I, II, III	TTh	107HE	Miss Child
187f,s	Special Food Problems..... (5 cred.; sr.; prereq., 182, Agr. Biochem. 2)	I, II, III 4 hrs. to be arranged	TTh	107HE	Miss Child
195s	Home Economics Survey..... (2 cred.; sr.; no prereq.)	IV	TS	203HE	Miss McNeal

HOME ECONOMICS EDUCATION

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Bldg.	Instructor
40f,s	Child Training ..... (3 cred.; jr., sr.; prereq., Psy. 1-2)	IV	MWF	213HE	Mr. Anderson
40w*	Child Training ..... (Same as 40f,s)	Ar	Ar	Ar	Mr. Anderson
42f,s†	Special Methods of Teaching Home Economics ..... (3 cred.; jr., sr.; prereq., H.E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)	VIII	MWF	213HE	Miss Rose

* Offered on the Minneapolis campus.

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

No.	Title	Hour	Day	Bldg.	Instructor
49f,w,s†	Observation and Teaching: General Home Economics ..... (8 cred.; sr.; prereq.,‡ 42)				
	Lect.	IX	TTh	213HE	Miss Rose
	Teaching .	Ar	Ar	Ar	Miss Rose and others
141f	Problems in Vocational Education in Home Economics ..... (2 cred.; sr.; prereq., 42)	Ar	Ar	Ar	Miss Clara Brown, Miss Rose
142s	Educational Measurement in Home Economics ..... (2 cred.; sr.; prereq., 42, Ed. Psy. 55)	Ar	Ar	Ar	Miss Clara Brown
143f,w,s	Home Economics Curricula..... (2 cred.; jr., sr.; prereq., 42 or parallel)	VIII	TTh	213HE	Miss Clara Brown, Miss Rose
147w	Organization and Methods for Related Art Teaching..... (3 cred.; jr., sr.; prereq., 42 or parallel; H.E. 53, 131 or parallel)	III	TThS	402HE	Miss H. Goldstein
149f,w,s	Research Problems ..... (Cred. ar.; sr.; permission of instructor)	Ar	Ar	Ar	Miss Clara Brown, Miss McNeal

HORTICULTURE

No.	Title	Hour	Day	Bldg.	Instructor
6f	Fruit Growing ..... (3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Alderman
	(Laboratory sections 2	IV	WF	8aHr	Mr. Alderman
	limited to 20 each) Sec. 1 Lab.	I, II	T or F	8Hr	Mr. Brierley
	2	VII, VIII	M	8Hr	Mr. Brierley
21w	Small Fruit Culture ..... (3 cred.; soph., jr., sr.; prereq., 6 or 32, Bot. 9 cred.)	I	~~MWF~~ T. Th. S	102Hr	Mr. Brierley
32s	Vegetable Growing ..... (3 cred.; no prereq.)				
	Sec. 1 Lect.	II	MW	102Hr	Mr. Krantz
	(~~Laboratory sections~~ 2	~~IV~~	~~TS~~	~~102Hr~~	with Cane!
	~~limited to 30 each)~~ Sec. 1 Lab.	I, II	T or F	8Hr	Mr. Traub
	2	VII, VIII	M	8Hr	
50s	Floriculture ..... (3 cred.; no prereq.)	III	MWF	102Hr	Mr. Cary, Mr. Sando
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

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

‡ In addition to other prerequisites a student registering for this course must have received a grade of C or higher in each of the following courses: H.E. 3, 11, 13, 50, 51, 53, 80 or 81, and 83.

No.	Title	Hour	Day	Bldg.	Instructor
73w	History of Landscape Gardening..... (3 cred.; all; no prereq.)	II	TThS	102Hr	Mr. Cary
74f	Principles of Landscape Design..... (3 cred.; sr.; prereq, Arch. 23)	VIII	T	8aHr	Mr. Cary
		VI, VII	TTh	8aHr	Mr. Cary
75w	Landscape Problems ..... (3 cred.; sr.; prereq., 74f; Agr. Eng. 3, 19)	VI, VII, VIII, IX	T	305En	Mr. Cary
		VI, VII, VIII	Th	305En	Mr. Cary
76s	Landscape Construction ..... (5 cred.; sr.; prereq., 75)	III	TTh	8aHr	Mr. Cary
		VI, VII, VIII	TTh	8aHr	
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	TS	103Hr	Mr. Brierley
		VI, VII	W	8Hr	Mr. Brierley
110w	Horticultural Crop Breeding..... (3 cred.; jr., sr.; prereq., Agron. 131)	III	TThS	106Hr	Mr. Wilcox
111f	Systematic Pomology ..... (3 cred.; jr., sr.; prereq., 6, Bot. 9 cred.)	II	TTh	102Hr	Mr. Alderman
		VI, VII	Th	8Hr	Mr. Brierley
135w-136f	Truck Crops and Potatoes..... (6 cred.; jr., sr.; prereq., 32, Bot 9 cred.)	Ar	Ar	Ar	Mr. Krantz
137f	Systematic Olericulture ..... (3 cred.; jr., sr.; prereq., 32, Agr. Biochem. 7-8, Bot. 113, 127)	Ar	Ar	Ar	Mr. Traub
138s	Laboratory Methods in Systematic Olericulture ..... (3-6 cred.; jr., sr.; prereq., 32, Agr. Biochem. 7-8, Bot. 113, 127)	Ar	Ar	Ar	Mr. Traub
190f-191w-192s	Special Problems ..... (6-12 cred.; jr., sr.; prereq., instructor'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

INORGANIC 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	
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.

* Offered on the Minneapolis campus.

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. a'g.)	VII	MTThF	105F	Ar
3w*	Higher Algebra, Short Course..... (Same as 3f)				
	Sec. 1	VIII	MTThF	105F	Ar
	2	IV	MTWF	105F	Ar
4f*	Trigonometry, Short Course..... (4 cred.; all; prereq., 3 or 5, or prep. higher alg.)	VIII	MTThF	105F	Ar
4w*	Trigonometry, Short Course	VII	MTThF	105F	Ar
	~~(Same as 4f)~~		M.T.W.F. 104		
4s*	Trigonometry, Short Course ..... (Same as 4f)				
	Sec. 1	VIII	MTThF	105F	Ar
	2	IV	MTWF	104F	Ar
5f*	Higher Algebra ..... (5 cred.; all; prereq., 1 yr. elem. alg.)				
	Sec. 1	II	MWThFS	133Ph	Ar
	2	VI	MTWThF	133Ph	Ar
5w*	Higher Algebra ..... (Same as 5f)	VI	MTWThF	166Ph	Ar
5s*	Higher Algebra ..... (Same as 5f)	I	TWThFS	133Ph	Ar
6f*	Trigonometry ..... (5 cred.; all; prereq., 3 or 5 or prep. higher alg.)	II	MWThFS	104F	Ar
6w*	Trigonometry ..... (Same as 6f)	VI	MTWThF	105F	Ar
6s*	Trigonometry ..... (Same as 6f)	IV	MTWFS	105F	Ar
7f*	College Algebra ..... (5 cred.; all; prereq., 6)	I	TWThFS	102F	Ar
7w*	College Algebra ..... (Same as 7f)	II	MWThFS	104F	Ar
7s*	College Algebra ..... (Same as 7f)	VI	MTWThF	104F	Ar
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

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

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
4f-5w*	Second Year Basic Course.....	V, VI	MWF	A	Ar
	(No cred.; soph.; prereq., 1-2-3)				
6s*	Second Year Basic Course.....	VII, VIII,			
	(No cred.; soph.; prereq., 4-5)	IX	T or W	A	Ar
51f-52w*	First Year Advanced Course.....	II	MWF	A	Ar
	(6 cred.; jr.; prereq., Second Year	III	MWF	A	Ar
	Basic Course)	VI	MWF	A	Ar
	(Additional 2-hour period to be ar-	VIII	MWF	A	Ar
	ranged for each section)				
53s*	First Year Advanced Course.....	VII, VIII,			
	(3 cred.; jr.; prereq., 51-52)	IX	T or W	A	Ar
	(Additional 2-hour period to be ar-				
	ranged for each section)				
54f-55w*	Second Year Advanced Course.....	II	MWF	A	Ar
	(6 cred.; sr.; prereq., 51-52-53)	III	MWF	A	Ar
	(Additional 2-hour period to be ar-	VI	MWF	A	Ar
	ranged for each section)	VIII	MWF	A	Ar
56s*	Second Year Advanced Course.....	VII, VIII,			
	(3 cred.; sr.; prereq., 54-55)	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-3s*	Freshman Physical Education.....				
	(Cred;† fr; no prereq.)				
	(Sections limited to 60 each)				
	Sec. 1	II	MW	Field House	
	2	II	TTh	Field House	
	3	III	MW	Field House	
	4	III	TTh	Field House	
	5	IV	MW	Field House	
	6	VI	MW	Field House	
	7	VI	TTh	Field House	
	8	VII	MW	Field House	
	9	VII	TTh	Field House	
	10	VIII	TTh	Field House (boxing)	
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	

* 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.

No.	Title	Hour	Day	Bldg.	Instructor
7f-8w-9s*	Advanced Leaders ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	T	A	Mr. Keller
	Lab.	Ar	Ar		
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		
30s*	Athletic Training and First Aid..... (2 cred.; jr., sr.; no prereq.)	I	MWF	A	Dr. Cooke

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

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
	6	V	MWF	3,151,153WGm	Ar
4w*	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	
	6	III	Th	Ar	
7f-8w*	Sophomore Danish 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	151WGm	
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

* Offered on the Minneapolis campus.
† Students may enter course in any quarter.

No.	Title	Hour	Day	Bldg.	Instructor
12s*	Sophomore Orthopedic and Individual Gymnastics	IV	TS	3WGm	Dr. Tolg
	(Same as 10-11)				
13f-14w-15s*	Sophomore Interpretive Dancing.....	VI	TTh	151WGm	Miss Baker
	(No cred.; soph ; prereq., 1-2-3)				
13w-14s*	Sophomore Interpretive Dancing.....	II	MW	151WGm	Miss Bockstruck
	(Same as 13f-14w-15s)				
16f-17w*	Sophomore Games and Folk Dancing..	I	MW	151WGm	Miss Warnock
	(No cred.; soph ; prereq., 1-2-3)				
18s*	Tennis				
	(No cred.; soph ; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	I	TTh	151WGm	
	3	IV	TS	151WGm	
	4	VIII	TTh	151WGm	
	5	VI	TTh	151WGm	
19f*	Sophomore Hockey				
	(No cred.; soph ; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	V	TTh	151WGm	
	3	VIII	TTh	151WGm	
20w*	Sophomore Basket-Ball				
	(No cred.; soph ; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	V	TTh	151WGm	
	3	VII	TTh	151WGm	
	4	VIII	TTh	151WGm	
21s*	Sophomore Baseball				
	(No cred.; soph ; prereq., 1-2-3)				
	Sec. 1	VII	WF	151WGm	
	2	V	TTh	151WGm	
22f,s-23w*‡	Sophomore Elementary Swimming....				
	(No cred.; soph ; prereq., 1-2-3)				
	Sec. 1	III	MW	51WGm	Miss Clayton
	2	IV	MW	51WGm	Miss Conger
	3	II	TTh	51WGm	Miss Clayton
	4	IV	TS	51WGm	Miss Clayton
	5	VII	TTh	51WGm	Miss Clayton
	6	VIII (3:30)	TTh	51WGm	Miss Clayton
	7	VIII (4:00)	TTh	51WGm	Miss Conger
22f,w,s*	Sophomore Elementary Swimming....	VII	MW	51WGm	
	(Same as 22-23)				
24f,s*†	Sophomore Horseback Riding.....	IX	MW		
	(No cred; soph.; prereq., 1-2-3)				
25f,s-26w*‡	Sophomore Intermediate Swimming...				
	(No cred.; soph.; prereq., 1-2-3, elementary swimming test)				
	Sec. 1	VIII (4:00)	MW	51WGm	
	2	III	TTh	51WGm	
	3	II	WF	51WGm	

* Offered on the Minneapolis campus.

† Students in this course will pay for lessons at about $1 per lesson but will not be charged the regular physical education fee.

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

No.	Title	Hour	Day	Bldg.	Instructor
27f*§	Sophomore Golf (advanced)..... (No cred.; soph.; prereq., 1-2-3)	VI	TTh		
27s*§	Sophomore Golf (elementary)..... (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	I	TTh		
	2	II	TTh		
28f,s-29w*‡	Sophomore Advanced Swimming..... (No cred.; soph.; prereq., 1-2-3, intermediate swimming test)	VIII	MW	51WGm	
30s*	Sophomore Life Saving and Water Sports ..... (No cred.; soph., jr., sr.; prereq., 1-2-3, adv. swimming test)	IX	MW	51WGm	Miss Conger
31w*	Sophomore Skating				
	Sec. 1	VII	WF		Miss Lane
	2	II	TTh		

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

PHYSIOLOGY

MEDICAL SCHOOL

No.	Title	Hour	Day	Bldg.	Instructor
4f,w,s*	Human Physiology ..... (4 cred.; prereq., 1 qtr. zool., 1 qtr. chem.)	III, IV	MWF	301MH	Dr. Lyon, Dr. Greisheimer, Dr. King, and others
57f*	Physiologic Chemistry ..... (4 cred.; jr., sr.; prereq., Zool. 5-6-7; Inorg. Chem. 1-2-3 or 9-10)	I	TThS	310MH	Mr. Pettibone and others
	Lab. Div. A	II, III, IV	T		
	Lab. Div. B	VI, VII, VIII	W		
58w-59s*	Human Physiology ..... (8 cred.; jr., sr.; prereq., same as 57)				
		I	TThS	301MH	Dr. Lyon, Dr. King, Dr. Loucks, and others
	Lab. Div. A	I, III, IV	T		
	Lab. Div. B	VI, VII, VIII	W		
100w-101s*	Physiologic Chemistry ..... (12 cred.; jr., sr.; prereq., zool., org. chem., phys.) (Div. A and B primarily for medical students)				
		IV	MWF	310MH	Mr. McClendon, Mr. Pettibone, and others
	Lab. Div. A	I, II, III	TTh		
	Lab. Div. B	I, II, III	FS		
	Lab. Div. C	VI, VII, VIII	TTh		

* Offered on the Minneapolis campus.

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

§ Students must supply their own golf equipment.

Phy Educ 3 2 s. Recreation. Activities w. Methods of Teaching 1 cr. no prereq. soph. jr. sr. in H. E. III T. Th. (offered) ap... quarters and in subsequent years.)

No.	Title	Hour	Day	Bldg.	Instructor
103f*	Physiology of Muscles, etc..... (8 cred.; lect. only, 5 cred.; jr., sr.; prereq., same as 100-101)				
	Lect. and rec.	II	MTWThFS	301MH	Mr. Scott,
	Lab. Div. A	VI, VII, VIII	M		Dr. King,
		III, IV	F		Dr. Loucks,
	Lab. Div. B	III, IV	W		and others
		VI, VII, VIII	F		
104w*	Physiology of Nervous System, etc... (7 cred.; lect. only, 4 cred.; jr., sr.; prereq., same as 100-101)				
	Lect. and rec.	III	MWFS	301MH	Mr. Scott,
	Lab. Div. A	9:00-11:00	F		Dr. Lyon,
		I, II	S		and others
	Lab. Div. B	9:00-11:00	MW		

For additional courses see the bulletin of the Medical School.

PLANT PATHOLOGY AND BOTANY

MEDICAL SCHOOL

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, Mr. Rodenhiser
7w-8s	Weeds and Grasses ..... (6 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III	TThS	3PP	Mr. Larson
		IV	TS	3PP	
9f	Weeds and Seed Testing..... (3 cred.; soph., jr., sr.; prereq., Bot. 9 cred.)	III	TThS	3PP	Mr. Larson
		IV	TS	3PP	
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. Lindgren
		I, II	TThS	1,2PP	
12w	Seed Problems ..... (3 cred.; jr., sr.; prereq., 9)	Ar	Ar	Ar	Mr. Larson
105f-106w-107s	Mycology ..... (9 cred.; jr., sr.; prereq., 1, 10, or equiv.)	Ar	Ar	Ar	Mr. Freeman, Miss Dosdall
		1:30 - 4:30	MF		
108f	Methods ..... (3 cred.; jr., sr.; prereq., 1 or 10, Bact. 41)	Ar	Ar	Ar	Mr. Leach
110w	Principles of Pathology ..... (4 cred.; jr., sr.; prereq., 1 or 10, Bact. 41)	III, IV	MWF	1,2PP	Mr. Stakman
111w	Diseases of Field Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	VI, VII	MWF	1,2PP	Mr. Christensen
112s	Diseases of Fruit Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	~~VI, VII~~	~~MWF~~	1,2PP	Mr. Leach
		I - II	T. Th.		
		III IX	W.		

* Offered on the Minneapolis campus.

No.	Title	Hour	Day	Bldg.	Instructor
113s	Diseases of Vegetable Crops..... (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1928-29			
114w	Advanced Forest Pathology ..... (3 cred.; jr., sr.; prereq., 1 or 10)	Not offered in 1928-29			
116f	Pathological Histology ..... (3 cred.; jr., sr.; prereq., 1 or 10)	III, IV	MWF	1,2PP	Mr. Leach
117s	Diseases of Forage and Fiber Crops.. (3 cred.; jr., sr.; prereq., 1 or 10)	III, IV	MWF	1,2PP	Mr. Christensen, Mr. Rodenhiser

POULTRY HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
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, Mr. Hoberg
4s	Incubating and Brooding ..... (3 cred.; no prereq.)	VI	MWF	201Ve	Mr. Smith, Mr. Hoberg
5s	Advanced Poultry Judging..... (3 cred.; prereq., 2)	VI, VII, VIII	TTh	201Ve	Mr. Smith
6s	Poultry Problems ..... (1 cred.; jr., sr.; prereq., 1)	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 ..... (2 cred.; fr.; no prereq.) (Limited to 40)	IV	TS	101bMH	Dr. Lees and others
	~~Increasing the Span of Human Life.. (3 cred.; jr., sr.; prereq., 10 cred. in science or social science)~~	~~III~~	~~TThS~~	~~101bMH~~	~~Dr. Myers~~
52f,w,s	Health Care of the Family..... (3 cred.; prereq., Bact. 41, 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
57f*	Health of Infant and Pre-school Child (2 cred.; jr., sr.; prereq., Zool. 1-2, Psy. 1-2; or 50, 52 or 53)	IV	TS	101bMH	
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.

* Offered on the Minneapolis campus.

52s. Health Care of the Family

Lab VIII F.

Sec. 1. Lab ~~VI~~ ~~VII~~ M. F.

2. " ~~VI~~ ~~VII~~ T. Th.

3. " ~~VI~~ ~~VII~~ T. S.

PSYCHOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w*	General Psychology				
	(6 cred.;† soph., jr., sr.; no prereq.)				
	Sec. 1 Lect.	I	MW	OLAud	Mr. Elliott
	Quiz	I	F	Psy	
	All students must register for the quiz hour which will be required three times each quarter.				
	Rec.	(one hour)			
		I	Th or F or S	Psy	
		II	Th or F	Psy	
		VII	Th or F	Psy	
	2 Lect	III	MWF	Psy	
	Quiz	I	F	Psy	
1w-2s*	General Psychology				
	(Same as 1f-2w)				
	(Sections limited to ~~30~~ 50)				
	Sec. 1	IX	MWF	Psy	
	2	VIII	MWF	Psy	

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

PUBLICATIONS AND RURAL JOURNALISM

No.	Title	Hour	Day	Bldg.	Instructor
10f-11w-12s	Agricultural Journalism	VI	MWF	105Ad	Mr. Kirkwood
	(9 cred.; jr., sr.; prereq., Journ. 13-14-15, 51-52)				
19w	Publicity	I	TThS	107En	Mr. Kirkwood
	(3 cred.; soph., jr., sr.; prereq., Journ. 13-14-15)				

For additional courses see under the Department of Journalism in the bulletin of the College of Science, Literature, and the Arts.

RHETORIC

No.	Title	Hour	Day	Bldg.	Instructor
1f	Rhetoric I				
	(3 cred.; no prereq.)				
	Sec. 1	I	MWF	308En	Mr. Furlow
	2	II	MWF	308En	Mr. Furlow
	3	III	MWF	310En	Miss Hessler
	~~4~~	~~I~~	~~TThS~~	~~308En~~	~~Mr. Furlow~~
	5	II	TThS	310En	Miss Hessler
1w	6	II	TThS	307En	Mr. Lansing
1w,s	Rhetoric I	III	TThS	310En	Miss Hessler
	(Same as 1f)				
	(Limited to 35)				
2f	Rhetoric II	II	MWF	310En	Miss Hessler
	(3 cred.; prereq., 1)				
	(Limited to 35)				

* Offered on the Minneapolis campus.

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

No.	Title	Hour	Day	Bldg.	Instructor
2w	Rhetoric II				
	(Same as 2f)				
	(Limited to 35 each)				
	Sec. 1	II	MWF	310En	Miss Hessler
	2	IV	MWF	308En	Mr. Furlow
	3	III	TThS	308En.	Mr. Lansing
	4	II	TThS	307En	Mr. Lansing
	5	III	MWF	310En	Miss Hessler
	6	I	MWF	308En	Mr. Furlow
2s	Rhetoric II	II	TThS	310En	Miss Hessler
	(Same as 2f)				
	(Limited to 35)				
3f	Rhetoric III	IV	MWF	308En	Mr. Furlow
	(3 cred.; prereq., 2)				
	(Limited to 35)				
3w	Rhetoric III	~~II~~ I	TThS	310En	Miss Hessler
	(Same as 3f)				
	(Limited to 35)				
3s	Rhetoric III				
	(Same as 3f)				
	(Limited to 35 each)	III	MWF new section.		
	Sec. 1	II	MWF	310En	Miss Hessler
	2	IV	MWF	310En	Miss Hessler
	3	I	MWF	308En	Mr. Furlow
	4	I	TThS	308En	Mr. Furlow
	~~5~~	~~II~~	~~MWF~~	~~310En~~	~~Miss Hessler~~ Cancel
	6	III	TThS	307En	Mr. Lansing
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. Lansing
	(Same as 11f)				
	(Limited to 30)				
11s	Argumentation	I	MWF	311En	Mr. Miller
	(Same as 11f)				
	(Limited to 30)				
22f,s	Public Speaking	III	MWF	311En	Mr. Miller
	(3 cred.; soph., jr., sr.; prereq., 3)				
	(Limited to 20)				
22w	Public Speaking	I	MWF	311En	Mr. Miller
	(Same as 22f,s)				
	(Limited to 20)				
23f,w,s	Public Speaking	IV	MTWFS	311En	Mr. Miller
	(5 cred.; soph., jr., sr.; prereq., 3)				
	(Limited to 30)				
24w	Advanced Public Speaking I.....	II	MWF	311En	Mr. Miller
	(3 cred.; soph., jr., sr.; prereq., 22)				
~~25s~~	~~Advanced Public Speaking II.....~~	~~II~~	~~MWF~~	~~311En~~	~~Mr. Miller~~ Cancel
	~~(3 cred.; soph., jr., sr.; prereq., 24)~~				
26f	Parliamentary Law.....	II	MW	311En	Mr. Miller
	(1 cred.; all; no prereq.)				
28f	Play Production	II	TThS	AudAd	Mr. Miller
	(3 cred.; soph., jr., sr.; prereq., 3)				

28s. — III T.Th.S. 311 Eng. Bldg.

No.	Title	Hour	Day	Bldg.	Instructor
31f	Survey of English Literature I..... (5 cred.; soph., jr., sr.; prereq.. 3) (Limited to 35)	III	MTWFS	308En	Mr. Lansing
31w	Survey of English Literature I..... (Same as 31f) (Limited to 35)	II	MTWFS	308En	Mr. Furlow
31s	Survey of English Literature I..... (Same as 31f) (Limited to 35)	III	MTWFS	308En	Mr. Furlow
32f	Survey of English Literature II.... (3 cred.; soph., jr., sr.; prereq , 3) (Limited to 35)	III	TThS	310En	Miss Hessler
33w,s	Modern Literature ..... (3 cred.; soph., jr., sr.; prereq , 3)	IV	MWF	307En	Mr. Lansing
34f	Books and Reading ..... (1 cred.; soph., jr., sr.; no prereq.)	IV	M	310En	Miss Hessler

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.; 3d qtr. fr., soph., jr., sr.; no prereq.)	IV	MWF	105En	Mr. Lundquist
14f,w	Rural Sociology ..... (3 cred.; soph., jr., sr.; prereq., 1 or sr. class)	I	MWF	105En	Mr. Lundquist

For additional courses and additional sections of the above courses offered on the Minneapolis campus, see the bulletin of the College of Science, Literature, and the Arts.

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
4f	Soils ..... (3 cred.; soph., jr., sr.; no prereq.)				
	Lect.	III	TTh	201So	Mr. Rost
	Lab.	III, IV	S	204So	
5s	Soil Fertility ..... (3 cred.; soph., jr., sr.; no prereq.)				
	Lect.	II	TTh	201So	Mr. Alway,
	Lab.	I, II	S	204So	Mr. Rost
8w	Physical Properties of Soils..... (3 cred.; soph., jr., sr.; prereq., 4)	Ar	Ar	Ar	Mr. McMiller
101f	Chemical Analysis of Soils..... (3 to 5 cred.; jr., sr.; prereq., 5, Quant. Anal.)	Ar	Ar	Ar	Mr. Rost
102w,s	Special Problems in Soils..... (Cred. assigned according to amount of work; jr., sr.; prereq., 101 or 108)	Ar	Ar	Ar	Mr. Alway, Mr. Rost
104s	Soil Surveying ..... (3 cred.; jr., sr.; no prereq.)	Ar	Ar	Ar	Mr. McMiller
107w	Fertilizers and Manures..... (2 cred.; jr., sr.; prereq., 5)	IV	TS	Ar	Mr. Rost
108	Physical Properties of Soils..... (3 cred.; jr., sr.; prereq., 4)	Not offered in 1928-29			

VETERINARY MEDICINE

No.	Title	Hour	Day	Bldg.	Instructor
2f-3w-4s	Comparative Anatomy and Physiology of Domestic Animals ..... (9 cred.;† soph., jr., sr.; no prereq.)	VI(f) I(w and s)	MWF TThS	103Ve 103Ve	Mr. Hewitt, Mr. Kernkamp
6f	Physiology of Reproduction ..... (4 cred.; jr., sr.; prereq., 2-3-4)	IV	MTWF	102Ve	Mr. Boyd
9w-10s	Veterinary Studies ..... (6 cred.;‡ soph., jr., sr.; no prereq.)	III	TThS	102Ve	Mr. Reynolds
12w	Infectious Diseases ..... (3 cred.; jr., sr.; prereq., 2-3-4, Bact. 41)	I	MWF	103Ve	Mr. Fitch
101w-102s	Advanced Anatomy of Domestic Animals ..... (6 cred.; jr., sr.; prereq., 2 or equiv.) (Limited to 9)	Ar	Ar	Ar	Mr. Kernkamp
103f-104w	Advanced Comparative Physiology... (8 cred.;§ jr., sr.; prereq., 3-4 or equiv.)				
	Lect.	II	MWF	102Ve	Mr. Hewitt
	Lab.	VI, VII	Th	209Ve	Mr. Hewitt

ZOOLOGY

COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

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

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

* Offered on the Minneapolis campus.

† The full course must be completed before credit will be given. The course may be started at the opening of any quarter.

‡ Full credit will not be allowed for this course when other courses in this division are completed. Students pursuing other courses in Veterinary Medicine should apply to the division for adjustment of credit.

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

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

Zoology 15w. 2 cut. same as fall quarter.

The Bulletin *of the* University *of* Minnesota

The School of Agriculture
Courses in Agriculture and Home Economics

Part I

Announcement of Courses for the Years 1928-1930

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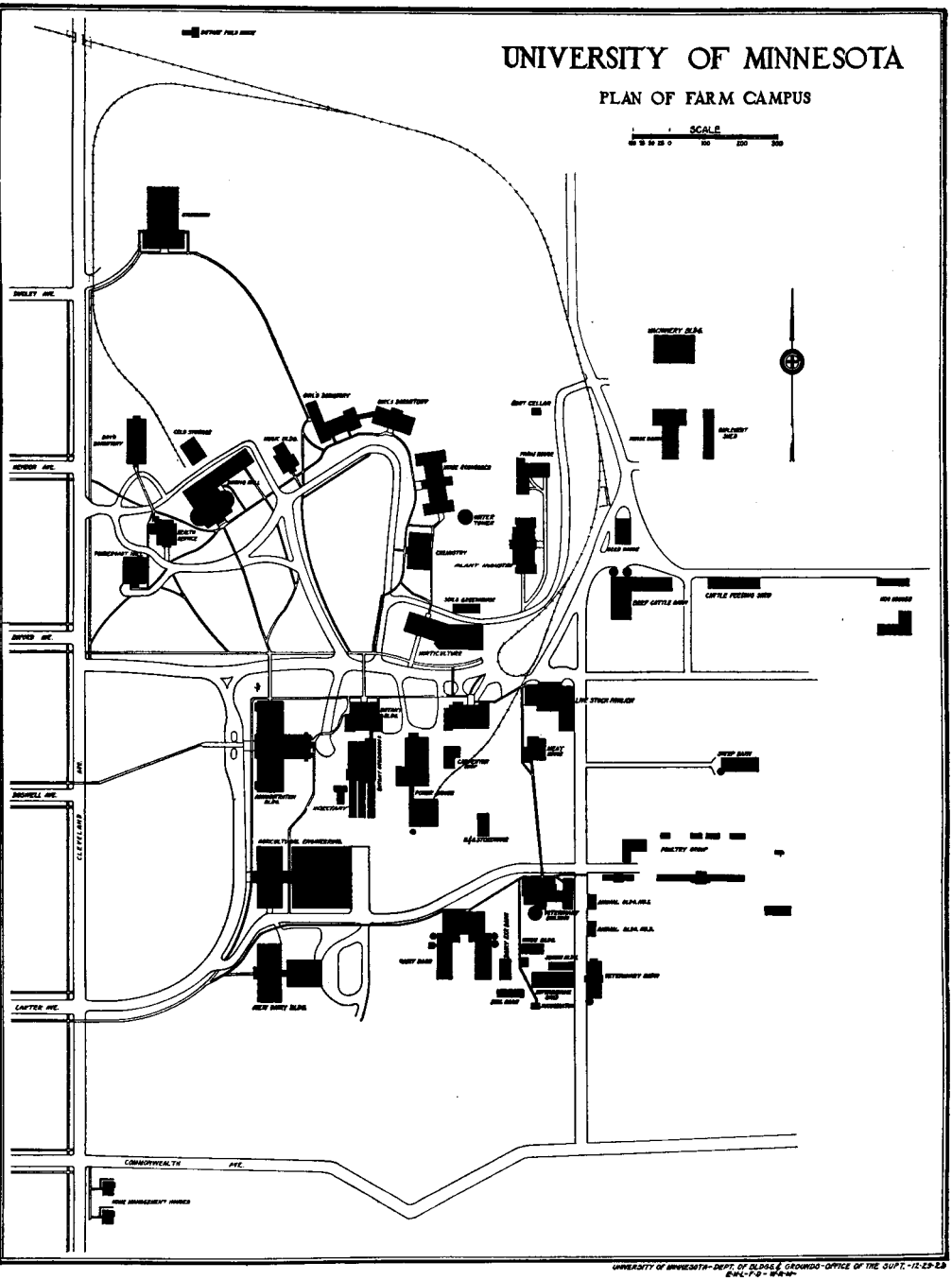
UNIVERSITY OF MINNESOTA

PLAN OF FARM CAMPUS



UNIVERSITY OF MINNESOTA - DEPT. OF BLDGS. & GROUNDS - OFFICE OF THE SUPT. - 12-23-28
E-H-L - F-D - W-R-M -

THE SCHOOL OF AGRICULTURE

FACULTY

ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Walter C. Coffey, M.S., LL.D., Dean of the Department of Agriculture
Dexter D. Mayne, Principal
Rodney M. West, B.A., Registrar
Johanna Hognason, B.A., Matron Boys' Dormitories
Laura A. Matson, M.A., Matron Girls' Dormitories
Harriet W. Sewall, B.A., Librarian

AGRICULTURAL BIOCHEMISTRY

Ross A. Gortner, Ph.D., Chief; Clyde H. Bailey, Ph.D., George S. Taylor, B.A.

AGRICULTURAL ECONOMICS

H. Bruce Price, Ph.D., Acting Chief; Arnold F. Hinrichs, B.S., Budd A. Holt, M.A.

AGRICULTURAL ENGINEERING

William Boss, Chief; Chester L. Berggren, J. Grant Dent, Bernard H. Gustafson, B.S., Maurice G. Jacobson, Jesse H. Neal, B.S. (A.E.), Harry B. Roe, B.S. in Eng., Arthur J. Schwantes, B.S., James B. Torrance, B.S. in Agr., Arthur G. Tyler, Hall B. White, B.S. in Agr.

AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

Andrew Boss, D.Sc., Chief; Louis B. Bassett, Harvey E. Brewbaker, Ph.D., Iver G. Johnson, B.S., D. Curtis Mumford, B.S., Stephen M. Raleigh, B.S., George A. Sallee, M.S.

ANIMAL HUSBANDRY

Walter H. Peters, M.Agr., Chief; Philip A. Anderson, B.S. in Agr., Alfred L. Harvey, M.S., Mark A. McCarty, M.S.

BEE CULTURE

James W. Thompson, B.S.

DAIRY HUSBANDRY

Clarence H. Eckles, D.Sc., Chief; Thor W. Gullickson, M.S., Edwin A. Hanson, B.S., William E. Petersen, M.S., Lloyd M. Thurston, B.S.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Royal N. Chapman, Ph.D., Chief; Solomon L. Loewen, B.A., Arthur G. Ruggles, M.A.

FORESTRY

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

GYMNASIUM AND PHYSICAL TRAINING

Robert Thompson, Director; Gladys Kaercher

HOME ECONOMICS

Wylie B. McNeal, M.A., Chief; Monica J. Aamodt, B.S., Carlotta Brown, Lola M. Cremeans, M.S., Hedda Kafka, B.S., Iva I. Sell, M.S., Helen J. Topp, B.S.

HORTICULTURE

William H. Alderman, B.S.A., Chief; Clarence E. Cary, B.S. in Agr., Franc P. Daniels, B.S. in Agr., Fred A. Krantz, Ph.D., Louis Sando

PLANT PATHOLOGY AND BOTANY

Edward M. Freeman, Ph.D., Chief; Charles S. Holton, B.S., Alvin H. Larson, B.S. in Agr., Howard E. Parson, B.S.

POULTRY HUSBANDRY

Arthur C. Smith, B.S., Chief

PREVENTIVE MEDICINE AND PUBLIC HEALTH

Harold S. Diehl, M.A., M.D., Director; Marbry Duryea, B.S., M.D., Hally J. Fisher, R.N., Joseph C. Hathaway, M.D.

RHETORIC

Robert C. Lansing, M.A., Chief; Elizabeth Hause, B.A., Marjorie Holbrook, B.S., Monica Langtry, B.A., Mary C. McNabb.

SCHOOL (GENERAL)

Dexter D. Mayne, Principal; David W. Boland, John O. Christianson, Bernice Dickerman, B.A., Johanna Hognason, B.A., Peder L. Johnsrud, B.S. in Agr., Christine Larson, Carrie M. Leavitt, Gustave A. Lundquist, Ph.D., Marjorie Martyn, B.A., Laura A. Matson, M.A., Rose Mertens, Hazel L. Wade, B.S., Mabel Willson.

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., Myron H. Reynolds, B.S., D.V.M., M.D.

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 on the campus, and the use of intoxicating liquors of all kinds 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 12:10 p.m., except Monday and Thursday, the students meet in the assembly hall. After the opening exercises, brief talks are given by the principal, members of the faculty, or invited guests. During the year the list of speakers will include prominent state and national officials, business men, particularly those connected with the agricultural industries, professional men 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 this school.

2. Gymnasium for the boys, or physical training for the 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 boys, 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 clothing 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 regular 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 umbrella 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. First term. (Price subject to change)	46.50
Second term. (Price subject to change)	43.00
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)	$79.25	$66.75
Non-resident	82.25	69.75
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 examination 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 shall 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 deportment. The class standings will count for 90 per cent and the student activities for 10 per cent. In determining the grades of scholarship the merit point system adopted by the registrar's office will be used. The rating for student activities will be based on the quality of leadership as indicated by a review of the activities participated in and the general deportment of the student during attendance at school. This rating will be determined by the scholarship committee in consultation with the preceptresses and the principal of the School of Agriculture.

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

Besides the above, annual scholarship prizes of $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 station 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 23.

For courses of study in home economics, see pages 24 to 25.

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 26 to 36, 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) farm mechanics, (c) grain elevator management, (d) horticultural and nursery training, or (e) livestock production.

Adults desiring a special course should consult the Enrolment Committee.

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

GENERAL FARMING

FRESHMAN YEAR

Required—First Term	Required—Second Term
English I, 3(f,w)	English II, 3(f,w)
Hygiene, 1(f,w)	Soils, 3(f,w)
Farm Arithmetic, 3(f,w)	Judging Breed Types of Livestock, 3(f,w)
Judging Types and Market Classes of Livestock, 3(f,w)	Animal Biology, 3(f,w)
Drawing and Farm Buildings, 3(f,w)	Gymnasium, 2(f,w)
Agricultural Botany, 3(f,w)	Electives, 6
Gymnasium, 2(f,w)	
Social Problems for Boys, 1(f,w)	
Electives, 2	

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
Physiology, 3(f,w)
Farm Buildings I, 3(f,w)
Tractor and Auto Work I, 3(f,w)
Mechanical Training I, 3(f,w)
Mechanical Training II, 3(f,w)
Food Selection and Preparation, 2(f,w)
Elementary Beekeeping I, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Plant Propagation and Nursery Practice, 3(f)
Floriculture, 3(w)
Dramatics, ½(f,w)[2]
Debating, 1(w)[2]
Typewriting I, 3(f,w)
Bookkeeping I, 3(f,w)
Bookkeeping II, 3(f,w)
Landscape Gardening, 3(f)
Elementary Beekeeping II, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(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)
Poultry Judging, 2(f)
Dressed Poultry, 1(f)
Home Projects, 1 to 3

JUNIOR YEAR

Required—First Term

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

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

ELECTIVES

Livestock Feeding and Management, 3(f)
Dairy Stock Feeding, 3(w)
Drainage and Roads, 3(f)
Farm Implements, 3(f)
Elementary Economics, 3(f,w)
English Literature I, 5(f)
Grain Marketing I, 3(f)
Commercial Law, 3(f,w)
Cereal Technology, 3(w)
Advanced Public Speaking, 3(f,w)
Plant Diseases, 3(f)
Farm Buildings II, 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)
Grain Marketing II, 3(w)

FARM MECHANICS

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, 3(f,w)
Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w) or Animal Biology, 3(f,w)
Gymnasium, 2(f,w)
Social Problems for Boys, 1(f,w)
Electives, 2

Required—Second Term

English II, 3(f,w)
Soils, 3(f,w)
Mechanical Training I, 3(f,w)
Farm Buildings I, 3(f,w)
Gymnasium, 2(f,w)
Electives, 6

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)
Food Selection and Preparation, 2(f,w)
Dramatics, ½(f,w)[2]
Debating, 1(w)[2]
Typewriting I, 3(f,w)
Bookkeeping I, 3(f,w)
Bookkeeping II, 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)
Mechanical Training II, 3(f,w)
Poultry Judging, 2(f)
Dressed Poultry, 1(f)
Plant Propagation and Nursery Practice, 3(f)
Floriculture, 3(w)
Landscape Gardening, 3(f)
Home Projects, 1 to 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.

JUNIOR YEAR

Required—First Term

English Classics, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Farm Horticulture, 3(f,w) or
Advanced Livestock Judging, 3(f,w)
Tractor and Auto Work I, 3(f,w)
Mechanics and Water Supply, 3(f,w)
Gymnasium, 2(f,w)
Electives, 3

Required—Second Term

Business English, 3(f,w)
Grain Crops, 3(f,w) or
Farm Horticulture, 3(f,w)
Farm Dairying, 3(f,w)
Heat and Electricity, 3(w)
Gymnasium, 2(f,w)
Electives, 6

ELECTIVES

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

SENIOR YEAR

Required—First Term

Public Speaking, 3(f,w)
Farm Buildings II, 3(f) or
Drainage and Roads, 3(f)
Rural Sociology, 3(f,w)
Farm Implements, 3(f)
Farm Management I, 3(f,w)
Gymnasium, 2(f,w)
Electives, 3

Required—Second Term

English VI, 3(f,w)
American Government, 3(f,w)
Farm Management II, 3(f,w)
Tractor and Auto Work II, 3(f,w)
Gymnasium, 2(f,w)
Electives, 6

ELECTIVES

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

GRAIN ELEVATOR MANAGEMENT

FRESHMAN YEAR

REQUIRED—FIRST TERM

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Grain Crops, 3(f,w)
Tractor and Auto Work I, 3(f,w)
Gymnasium, 2(f,w)
Social Problems for Boys, 1(f,w)
At least 3 credits chosen from:
- Agricultural Botany, 3(f,w)
- Chemistry of Plant and Animal Life I, 3(f,w)
- Judging Types and Market Classes of Livestock, 3(f,w)
- Penmanship, 1(f,w)

Electives, 2

REQUIRED—SECOND TERM

English II, 3(f,w)
Advanced Farm Arithmetic, 3(f,w)
Forage Crops and Potatoes, 3(f,w)
Soils, 3(f,w)
Mechanical Training I, 3(f,w)
Gymnasium, 2(f,w)
Electives, 3

ELECTIVES

Food Selection and Preparation, 2(f,w)
Judging Types and Market Classes of Livestock, 3(f,w)
Drawing and Farm Buildings, 3(f,w)
Agricultural Botany, 3(f,w)
Physiology, 3(f,w)
Farm Buildings I, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Plant Propagation and Nursery Practice, 3(f)
Floriculture, 3(w)
Dramatics, ½(f,w)[2]
Debating, 1(w)[2]
Typewriting I, 3(f,w)
Mechanical Training II, 3(f,w)
Poultry Judging, 2(f)
Dressed Poultry, 1(f)
Judging Breed Types of Livestock, 3(f,w)
Animal Biology, 3(f,w)
Landscape Gardening, 3(f)
Elementary Beekeeping II, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(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)
Home Projects, 1 to 3

JUNIOR YEAR

REQUIRED—FIRST TERM

English Classics, 3(f,w)
Feeds and Feeding, 3(f,w)
Bookkeeping I, 3(f,w)
Insect Pests of Plants, 3(f)
Gymnasium, 2(f,w)
At least 3 credits chosen from:
- Farm Building I, 3(f,w)
- Mechanics and Water Supply, 3(f,w)
- Typewriting I, 3(f,w)

Electives, 3

REQUIRED—SECOND TERM

Business English, 3(f,w)
Co-operative Accounting, 3(w)
Commercial Law, 3(f,w)
Elementary Economics, 3(f,w)
Parliamentary Law, 1(f,w)
Seed Testing, 2(w)
Gymnasium, 2(f,w)
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

Bookkeeping II, 3(f,w)
Advanced Livestock Judging, 3(f,w)
Dairy Stock Judging, 2(f,w)
Farm Horticulture, 3(f,w)
Algebra I, 7(f,w)
Geometry I, 7(f,w)
Industrial History, 3(f,w)
Chemistry of Plant and Animal Life I, 3(f,w)
Mechanics and Water Supply, 3(f,w)
Management of Laying Flock, 1(f,w)
Physiology and Hygiene of Breeding, 2(f)
Orchard Fruit Growing, 3(f)
Small Fruit Growing, 3(w)
Elements of Bacteriology, 3(w)
Potato Production, 3(w)
Advanced Beekeeping, 3(f,w)
Land Clearing, 3(w)
Veterinary Studies I, 3(f)
Farm Dairying, 3(f,w)
Poultry, 3(f,w)
Greenhouse Construction and Management, 3(w)
Special Problems in Horticulture, (w)
Algebra II, 7(f,w)
Geometry II, 7(f,w)
Meats, 3(f,w)
Chemistry of Plant and Animal Life II, 3(f,w)
Heat and Electricity, 3(w)
Incubating and Brooding, 3(w)
Tractor and Auto Work II, 3(f,w)
Commercial Vegetable Gardening, 3(w)
Veterinary Studies II, 3(w)
Weeds, 2(f)
American History, 3(f,w)
Forest Nursery Methods and Tree Planting, 3(w)
Test Association Methods, 3(w)

SENIOR YEAR

Required—First Term

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

Required—Second Term

English VI, 3(f,w)
Cereal Technology, 3(w)
Crop Breeding, 3(w)
Grain Marketing II, 3(w)
Judging and Grading Farm Crops, 3(w)
Farm Management II, 3(f,w)
Gymnasium, 2(f,w)

ELECTIVES

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

HORTICULTURAL AND NURSERY TRAINING

FRESHMAN YEAR

Required—First Term

English I, 3(f,w)
Hygiene, 1(f,w)
Farm Arithmetic, 3(f,w)
Agricultural Botany, 3(f,w)
Farm Horticulture, 3(f,w)
Plant Propagation and Nursery Practice, 3(f)
Social Problems for Boys, 1(f,w)
Gymnasium, 2(f,w)
Electives, 2

Required—Second Term

English II, 3(f,w)
Soils, 3(f,w)
Drawing and Farm Buildings, 3(f,w)
Floriculture, 3(w)
Commercial Vegetable Gardening, 3(w)
Gymnasium, 2(f,w)
Judging Types and Market Classes of Livestock, 3(f,w)

ELECTIVES

Judging Breed Types of Livestock, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Advanced Farm Arithmetic, 3(f,w)
Elements of Music I, 2(f,w)
Elements of Music II, 2(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Physiology, 3(f,w)
Dramatics, ½(f,w)[2]
Debating, 1(w)[2]
Typewriting I, 3(f,w)
Bookkeeping I, 3(f,w)
Food Selection and Preparation, 2(f,w)
Appreciation of Music, 3(f,w)
Instrumentation and Conducting, 3(f,w)
Elementary Beekeeping II, 3(f,w)
Tractor and Auto Work I, 3(f,w)
Farm Buildings I, 3(f,w)
Poultry, 3(f,w)
Poultry Judging, 2(f)
Dressed Poultry, 1(f)
Chorus, ½(f,w)
Violin, ½(f,w)[1]
Piano, ½(f,w)[1]
Instrumental Music, ½(f,w)[1]
Orchestra, ½(f,w)
Voice, ½(f,w)[1]
Band, ½(f,w)
Harmony I, 2(f,w)
Harmony II, 2(f,w)

JUNIOR YEAR

Required—First Term

English Classics, 3(f,w)
Chemistry of Plant and Animal Life I, 3(f,w)
Tractor and Auto Work I, 3(f,w) or Mechanical Training I, 3(f,w)
Animal Biology, 3(f,w)
Landscape Gardening, 3(f)
Gymnasium, 2(f,w)
Electives, 3

Required—Second Term

Business English, 3(f,w)
Chemistry of Plant and Animal Life II, 3(f,w)
Seed Testing, 2(w)
Forest Nursery Methods and Tree Planting, 3(w)
Greenhouse Construction and Management, 3(w)
Gymnasium, 2(f,w)
Electives, 4

ELECTIVES

Grain Crops, 3(f,w)
Forage Crops and Potatoes, 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)
Veterinary Studies I, 3(f)
Advanced Beekeeping, 3(f,w)
Parliamentary Law, 1(f,w)
Land Clearing, 3(w)
Dairy Stock Judging, 2(f,w)
Advanced Livestock Judging, 3(f,w)
Meats, 3(f,w)
Mechanical Training II, 3(f,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 II, 3(w)
Farm Dairying, 3(f,w)
Co-operative Accounting, 3(w)
Test Association Methods, 3(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.

SENIOR YEAR

Required—First Term

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

Required—Second Term

English VI, 3(f,w)
Rural Sociology, 3(f,w)
Crop Breeding, 3(w)
Bookkeeping II, 3(f,w)
Small Fruit Growing, 3(w)
Gymnasium, 2(f,w)
Electives, 3

ELECTIVES

Judging and Grading Farm Crops, 3(w)
Farm Implements, 3(f)
Farm Management I, 3(f,w)
Livestock Feeding and Management, 3(f)
Dairy Stock Feeding, 3(w)
Drainage and Roads, 3(f)
English Literature I, 5(f)
Elementary Economics, 3(f,w)
Cereal Technology, 3(w)
Commercial Law, 3(f,w)
Farm Management II, 3(f,w)
Livestock Breeding, 3(f,w)
Milk Production, 3(w)
Dairy Stock Selection, 3(w)
Farm Buildings II, 3(f)
English Literature II, 5(w)
Advanced Public Speaking, 3(f,w)
Rural Economics, 3(f,w)
Grain Marketing I, 3(f)
Grain Marketing II, 3(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, 3(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, 2

Required—Second Term

English II, 3(f,w)
Soils, 3(f,w)
Judging Breed Types of Livestock, 3(f,w)
Animal Biology, 3(f,w)
Gymnasium, 2(f,w)
Electives, 6

ELECTIVES

Advanced Farm Arithmetic, 3(f,w)
Physiology, 3(f,w)
Mechanical Training II, 3(f,w)
Farm Buildings I, 3(f,w)
Tractor and Auto Work I, 3(f,w)
Elementary Beekeeping I, 3(f,w)
Mechanical Training I, 3(f,w)
Spelling, 1(f,w)
Penmanship, 1(f,w)
Poultry, 3(f,w)
Poultry Judging, 2(f)
Dressed Poultry, 1(f)
Farm Horticulture, 3(f,w)
Elementary Beekeeping II, 3(f,w)
Dramatics, ½(f,w)[2]
Debating, 1(w)[2]
Typewriting I, 3(f,w)
Bookkeeping I, 3(f,w)
Elements of Music I, 2(f,w)
Food Selection and Preparation, 2(f,w)
Elements of Music II, 2(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)
Plant Propagation and Nursery Practice, 3(f)
Floriculture, 3(w)
Landscape Gardening, 3(f)
Bookkeeping II, 3(f,w)
Home Project, 1 to 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.

JUNIOR YEAR

REQUIRED—FIRST TERM

English Classics, 3(f,w)
Forage Crops and Potatoes, 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)
Veterinary Studies I, 3(f)
Gymnasium, 2(f,w)
Electives, 1 or 2

REQUIRED—SECOND TERM

Business English, 3(f,w)
Meats, 3(f,w)
Farm Dairying, 3(f,w)
Veterinary Studies II, 3(w)
Gymnasium, 2(f,w)
Electives, 6

ELECTIVES

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

SENIOR YEAR

REQUIRED—FIRST TERM

Public Speaking, 3(f,w)
American Government, 3(f,w)
Livestock Feeding and Management, 3(f) or Milk Production, 3(w)
Livestock Breeding, 3(f,w) for men or Problems in Livestock Improvement, 3(w) for women
Farm Management I, 3(f,w)
Gymnasium, 2(f,w)
Electives, 3

REQUIRED—SECOND TERM

English VI, 3(f,w)
Rural Sociology, 3(f,w)
Farm Management II, 3(f,w)
Gymnasium, 2(f,w)
Electives, 9

ELECTIVES

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

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.

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)
Clothing I, 3(f,w)	Clothing II, 3(f,w)
Design, 2(f,w)	Electives, 6
Physical Training, 2(f,w)	Physical Training, 2(f,w)
Electives, 2	
Social Training, 2(f,w)	

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 I, 3(f,w)
Violin, ½(f,w)[1]	Bookkeeping II, 3(f,w)
Piano, ½(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 and Nursery Practice, 3(f)
Appreciation of Music, 3(f,w)	Floriculture, 3(w)
Instrumentation and Conducting, 3(f,w)	Farm Arithmetic, 3(f,w)
Poultry Judging, 2(f)	Advanced Farm Arithmetic, 3(f,w)
Dressed Poultry, 1(f)	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 Dressmaking I, 3(f)	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)

[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

Millinery I, 3(f,w)
Advanced Millinery, 3(w)
Decorative Needlework, 3(w)
Chemistry of Plant and Animal Life I, 3(f,w)[1]
Elements of Bacteriology, 3(w)[2]
Household Physics, 5 (f)
Utilization of Meats, 3(w)
Advanced Beekeeping, 3(f,w)
Farm Dairying, 3(f,w)
Stenography II, 3(f,w)[2]
Stenography III, 3(f,w)
Typewriting II, 3(f,w)
Typewriting III, 3(f,w)
Algebra I, 7(f,w)
Algebra II, 7(f,w)
Geometry I, 7(f,w)
Geometry II, 7(f,w)
Industrial History, 3(f,w)
Parliamentary Law, 1(f,w)
Chemistry of Plant and Animal Life II, 3(f,w)[1]
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)

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)
Textiles and Dressmaking II, 3(w)
Child Care and Training, 2(w)
Electives, 5
Physical Training, 2(f,w)

ELECTIVES

Trade Dressmaking, 5(w)[3]
Trade Millinery, 5(w)[3]
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] A fee of $10 is charged for this course.

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

[3] Not offered in 1928-29.

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.

A3. Cereal Technology. Lecture, laboratory, and demonstration course dealing with the fundamental bases of grain grading, the merchandising, storage, and utilization of the grain crops.

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.

A40. Grain Marketing I. Management problems of the grain business in local markets; financial and business organization of local grain elevators. Analysis of buying, selling, hedging, and sideline problems.

A41. Grain Marketing II. Organization of terminal grain markets and their relation to country grain business; function of grain exchanges, future trading, commission firms, terminal elevators, and central co-operative organizations.

AGRICULTURAL ENGINEERING

A10. 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.

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. Mechanical Training I. General. Instruction and laboratory practice in rope splicing, knots, belt lacing, pulleys and shafting, soldering, electric wiring, and cement work.

A17. Mechanical Training II. Iron Work. Instruction and laboratory practice in pipe fitting, valves, babbitting, roller and ball bearings, forge work and cold metal work.

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 this 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. 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 a 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, FARM MANAGEMENT, AND PLANT GENETICS

A1. Grain Crops. Including the history, culture, judging, and uses of the important grain crops including corn.

A2. Forage Crops and Potatoes. A study of the characteristics, growing, harvesting, and storing of the important forage and silage crops followed by a brief study of potatoes as a field crop.

A3. Judging and Grading Farm Crops. Factors which influence the value of crops for seed, feed, and market, with practice in comparative judging and the application of federal grades.

A5. Crop Breeding. Modern methods of propagating and breeding the various agricultural crops with plans for growing and certifying pedigreed seed.

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.

A8. Test Association Methods. A study of methods, organization, and procedure in cow testing associations; designed to fit the student to serve as a tester.

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. Clothing I. Study of materials used for construction of simple undergarments and children's clothes; comparison with ready-made garments; use and care of sewing machines; use of commercial patterns.

A2. Clothing II. Study of cotton and linen fabrics; selection and construction of a simple wash dress; comparison with ready-made dresses. Care of clothing, repair, storage, and cleaning.

A4. Textiles and Dressmaking I. Study of wool fabrics; selection and construction of a wool dress; comparison with ready-made dresses. Problems of buying coats, hats, shoes, hosiery, and dress accessories.

A5. Textiles and Dressmaking II. Study of silk fabrics; selection and construction of a silk dress; comparison with ready-made dresses. Problems in buying household textile furnishings.

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.

A12. Trade Dressmaking. To be offered in co-operation with city dressmaking shops, giving students actual trade experience. (Not offered in 1928-29.)

A13. Trade Millinery. To be offered in co-operation with city millinery shops, giving students actual trade experience. (Not offered in 1928-29.)

A21. Design. Principles of design and color harmony with special reference to suitable clothing; furnishing and arrangement of rooms; craft problems.

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. Food 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. Family and community relationships.

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 everyday life, especially those relating to the home and scientific principles which explain them.

A51. Related Science II. A continuation of Course A50.

A73. Food Selection and Preparation. A study of food combinations suitable for meals at home or in camp. Practical work in the fundamental cookery processes.

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 foı 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 and Nursery Practice. 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.

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.

A7. Poultry Judging. Practice in the selection of the most profitable fowls; a study of standard requirements of the commercially important breeds.

A10. Dressed Poultry. Modern methods of killing, picking, and dressing for home and trade use.

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.

* 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.

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.

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: Hohmann, *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 Clavicord. Sonatinas: Clementi, Kuhlan. Sonatas: Haydn, Mozart, Beethoven. Solos for all grades; classics and best modern material. Ten thirty-minute lessons, $10 per term.

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.

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

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.

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 at home, for office work on the farm, in the village, or subordinate positions in regular business offices.

The subject-matter of these courses, combined with the courses in home-making and agriculture, gives the students a training which well qualifies them to take positions as office assistants in farm bureaus, co-operative creameries, and local elevators.

A80. Typewriting I. The touch method of typewriting is taught. Following the memorization and fingering of the keyboard, drills for acceleration, concentration, and rhythm are given.

A81. Typewriting II. A continuation of carefully planned drills for the development of accuracy and speed. Work in tabulating, letter writing, and practice on different makes of typewriters, with their care.

A82. Typewriting III. Business correspondence from the 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 the exercising of initiative in solving

original problems. Drills for the development of speed and accuracy are stressed.

A83. Stenography I. The principles of phonography are taught by the Gregg system. Thoro drill is given on word forms, and in the combining of them in phrases.

A84. Stenography II. A continuation of Stenography I. Drills on words and phrases. Dictation and the reading of Gregg exercises. Short paragraphs dictated and read back.

A85. Stenography III. Students review carefully the principles of stenography, and take short letters from dictation. Letters transcribed on the typewriter. Accuracy of transcription is the aim, rather than speed.

A86. Bookkeeping I. 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.

A87. Bookkeeping II. Takes up the partnership form of business organization and continues accounting principles. An advanced set of books is kept.

A88. 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 associations.

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 I. The animal body in health and disease; causes, prevention, and management of disease including common parasitic diseases; detail; simple surgical operations.

A8. Veterinary Studies II. Common diseases and accidents, general advice; diseases; detail; simple surgical operations.

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
1928 - 1929

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1928

JULY

Su	Mo	Tu	W	Th	Fr	Sa
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AUGUST

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1929

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DECEMBER

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CALENDAR

SCHOOL OF AGRICULTURE

1928-29

1928			
October	1	Monday	First term begins; entrance examinations, registration, payment of fees
October	2	Tuesday	Regular class work begins
November	6	Tuesday	General Election Day; a holiday
November	12	Monday	A holiday (Sunday, November 11, Armistice Day)
November	29	Thursday	Thanksgiving Day; a holiday
December	21	Friday	First term closes; Christmas vacation begins, 12:00 m.
1929			
January	7	Monday	Second term begins; entrance examinations, registration, payment of fees
January	8	Tuesday	Regular class work begins
February	12	Tuesday	Lincoln's Birthday; a holiday
February	22	Friday	Washington's Birthday; a holiday
March	23	Saturday	Second term closes
March	26	Tuesday	Alumni Day
March	27	Wednesday	Fortieth annual commencement

COURSES OF STUDY

The following summary of required work in the various courses of study is for convenience in registration. For the 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, Soils, Judging Breed Types of Livestock, Animal Biology.

Junior year.—English Classics, Forage Crops and Potatoes, Advanced Livestock Judging or Dairy Stock Judging, Farm Horticulture, Feeds and Feeding, Business English, Grain 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, Soils, Mechanical Training I, Farm Buildings I.

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

Senior year.—Public Speaking, Farm Buildings II 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, Advanced Farm Arithmetic, Grain Crops, Forage Crops and Potatoes, Tractor and Auto Work I, Soils, Mechanical Training I, Social Problems for Boys, and optional courses.

Junior year.—English Classics, Business English, Feeds and Feeding, Bookkeeping I, Co-operative Accounting, Commercial Law, Elementary Economics, Parliamentary Law, Insect Pests of Plants, Seed Testing, and optional courses.

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

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 and II, Animal Biology, Greenhouse Construction and Management, Landscape Gardening, Business English, Seed Testing, Tractor and Auto Work I or Mechanical Training I, Forest Nursery Methods and Tree Planting.

Senior year.—Public Speaking, American Government, Plant Diseases, Insect Pests of Plants, English VI, Rural Sociology, Crop Breeding, Bookkeeping II, Small Fruit Growing.

LIVESTOCK PRODUCTION

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

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

Senior year.—Public Speaking, American Government, Livestock Feeding and Management or Milk Production, Livestock 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	So	Soils
FH	Farm House	St	Stock Pavilion
Gy	Gymnasium	Ve	Veterinary
HE	Home Economics	WH	Women's Hall

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	I, II	MWF	102BCh	Mr. Taylor
A1w	Chemistry of Plant and Animal Life ..... (3 cred.*; jr., sr.; no prereq.)	III, IV	TThS	102BCh	Mr. Taylor
A2f	Chemistry of Plant and Animal Life ..... (3 cred.*; jr., sr.; prereq., A1)	III, IV	TThS	102BCh	Mr. Taylor
A3w	Cereal Technology ..... (3 cred.; sr. agr.; prereq., A1-2 advised)	III	MWF	116BCh	Mr. Bailey, Mr. Taylor

AGRICULTURAL ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
A1w	Co-operative Accounting	VI	TTh	204Da	Mr. Holt
	(3 cred.; jr., sr. agr.; prereq., Sch. A87)	VII, VIII	T	204Da	Mr. Holt
A40f	Grain Marketing I..... (3 cred.; sr. agr.; prereg. Sch. A43)	IV	TThS	204Da	Mr. Price, Mr. Hinrichs
A41w	Grain Marketing II..... (3 cred.; sr. agr.; prereq., A40)	IV	TThS	204Da	Mr. Price, Mr. Hinrichs

AGRICULTURAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
A10f	Farm Implements ..... (3 cred.; sr. agr.; no prereq.)	VI, VII, VIII	TTh	49,52En	Mr. Schwantes
A11f	Tractor and Auto Work I.... (3 cred.; all agr.; no prereq.)	VI, VII, VIII	WF	216,37En	Mr. Torrance
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.... (3 cred.; jr., sr. agr.; prereq., C grade in A11)	III, IV	TThS	216,37En	Mr. Torrance
A16f,w	Mechanical Training I..... (3 cred.; all agr.; no prereq.)	VI, VII, VIII	TTh	20,106En	Mr. Dent
A17f,w	Mechanical Training II..... (3 cred.; all agr.; no prereq.)	VI, VII, VIII	WF	20,106En	Mr. Dent
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

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

No.	Title	Hour	Day	Bldg.	Instructor
A18w	Mechanics and Water Supply	II	ThS	103En	Mr. Tyler
	(3 cred.; jr., sr. agr.; no prereq.)	I, II	T	102En	Mr. Tyler
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. Berggren
	2	VI, VII, VIII	WF	41En	Mr. Berggren
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.....	I	M	305En	Mr. White
	(3 cred.; sr. agr.; prereq., A21, A31)	I, II	WF	305En	Mr. White
A41f	Household Physics	VIII	MTThF	101En	Mr. Tyler
	(5 cred.; jr., sr. H.E.; no prereq.)	VIII, IX	W	102En	Mr. Tyler
A51f	Drainage and Roads.....	I, II	MWF	215En	Mr. Neal, Mr. Roe
	(3 cred.; sr. agr.; no prereq.)				
A52w	Land Clearing	III	TThS	217En	Mr. Gustafson
	(3 cred.; jr., sr. agr.; no prereq.)				

AGRONOMY, FARM MANAGEMENT, AND PLANT GENETICS

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Grain Crops				
	(3 cred.; jr., sr. agr.; no prereq.)				
	Lect. Sec. 1	I	TS	105Ad	Mr. Raleigh
	Lab.	I, II	Th	105Ad	
	Lect. 2	IV	ThS	105Ad	
	Lab.	III, IV	T	105Ad	
A2f,w	Forage Crops and Potatoes....				
	(3 cred.; jr., sr. agr.; no prereq.)				
	Sec. 1	I, II	T	100Ad	Mr. Johnson
		II	ThS	100Ad	
	2	III, IV	Th	100Ad	
		III	TS	100Ad	

No.	Title	Hour	Day	Bldg.	Instructor
A3w	Judging and Grading Farm Crops ..... (3 cred.; sr. agr.; prereq., A1, A2)	VI, VII	MWF	100Ad	Mr. Raleigh
A5w	Crop Breeding ..... (3 cred.; sr. agr.; no prereq.)				
	Sec. 1	I	MWF	102Ad	Mr. Brewbaker
	2	II	MWF	102Ad	
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. Sallee
A22f,w	Farm Management II..... (3 cred.; sr. agr.; no prereq.)				
	Sec. 1	VI, VII	MWF	118Ad	Mr. Bassett
	2	VI, VII	MWF	108Da	Mr. Mumford

ANIMAL HUSBANDRY

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Judging Types and Market Classes of Livestock..... (3 cred.; all agr.; no prereq.)				
	Sec. 1	I, II	MWF	ESt	Mr. Harvey, Mr. McCarty
	2	III, IV	TThS	ESt	
	3	III, IV	MWF	WSt	
A2f,w	Judging Breed Types of Livestock ..... (3 cred.; all agr.; prereq., A1)				
	Sec. 1	I, II	TThS	WSt	Mr. Harvey, Mr. McCarty
	2	III, IV	TThS	WSt	
A3f,w	Advanced Livestock Judging (3 cred.; jr., sr. agr.; prereq., A2)	VI, VII	MWF	ESt	Mr. Harvey
A4f	Meats ..... (3 cred.; jr., sr. agr.; prereq., 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., A2)	III	MWF(f) (w)	3St 206Da	Mr. Peters
A6f	Livestock Feeding and Management ..... (3 cred.; sr. agr.; prereq., A2, Dy. Husb. A1)	IV	MWF	3St	Mr. Harvey
A7w	Utilization of Meats..... (3 cred.; jr., sr. H.E.; no prereq.)	II	MWF	MS	Mr. Anderson
A8w	Problems in Livestock Improvement ..... (3 cred.; sr. women spec. in livestock production; prereq., 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	
		3	I	TThS	1FH	Mr. Thompson
A1w	Elementary Beekeeping I..... (Same as A1f)					
		Sec. 1	II	TThS	1FH	
		2	III	TThS	1FH	Mr. Thompson
A2f	Elementary Beekeeping II.... (3 cred.; all; prereq., A1)		II	TThS	1FH	
A2w	Elementary Beekeeping II... (Same as A2f)					
		Sec. 1	I	MWF	1FH	Mr. Thompson
		2	II	MWF	1FH	
		3	I	TThS	1FH	Mr. Thompson
A3f,w	Advanced Beekeeping ..:..... (3 cred.; jr., sr.; prereq., 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
A2f,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	
A3w	Dairy Stock Judging..... (Same as A3f)					
	(Limited to 30 students each)	Sec. 1	III, IV	MW	DB	Mr. Petersen
		2	V, VII	TTh	DB	
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. Petersen
A7w	Dairy Stock Selection..... (3 cred.; sr. agr.; prereq., A3, A5)		VI, VII	MWF	100HH	Mr. Petersen
A8w	Test Association Methods..... (3 cred.; jr., sr. agr.; prereq., A1, A2, and approval of instructor)		III	MWF	100HH	Mr. Hanson

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. Loewen
	2	II	MWF	301Ad	
	3	III	MWF	301Ad	
A3w	Biology ..... (3 cred.; jr., sr. H.E.; no prereq.)	II	TThS	307Ad	Mr. Loewen
A16f	Insect Pests of Plants..... (3 cred.; jr., sr.; no prereq.)	VI, VII, VIII	TTh	301Ad	Mr. Ruggles

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
	Men				
A1f,w	Gymnasium ..... (2 cred.; all agr.; no prereq.)				
	Sec. 1	IX	TTh	Gy	Mr. Thompson
	2	VI	TTh	Gy	
	3	VIII	TTh	Gy	
	4	VIII	MW	Gy	
	5	VII	M	Gy	
		VIII	W	Gy	
	Women				
A1f,w-2w,f	Freshman Physical Training (2 cred.; all H.E.; no prereq.)				
	Sec. 1	IX	MWF	Gy	Miss Kaercher
	2	VIII	MWF	Gy	
A3f,w-4w,f	Junior Physical Training..... (2 cred.; jr., sr. H.E.; prereq., A1-2)	III	TTh	Gy	
		VIII	Th	Gy	
A5f,w-6w,f	Senior Physical Training..... (2 cred.; sr. H.E.; prereq., A3-4)	IV	TTh	Gy	
		IX	Th	Gy	

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

No.	Title	Hour	Day	Bldg.	Instructor
A2f,w	Clothing II ..... (3 cred.; all H.E.; prereq., A1)	I	MTWThS	114HE	Miss Kafka
A4f	Textiles and Dressmaking I... (3 cred.; jr., sr. H.E.; prereq., A2)	III, IV	MWF	114HE	Miss Kafka
A5w	Textiles and Dressmaking II.. (3 cred.; jr., sr. H.E.; prereq., A4)	VI, VII	MWF	114HE	Miss Sell
A6w	Decorative Needlework ..... (3 cred.; jr., sr. H.E.; prereq., A1, A21)	VI, VII, VIII	TTh	114HE	Miss Topp
A7f,w	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)	Not offered in 1928-29			
A13	Trade Millinery ..... (5 cred.; sr. H.E.; prereq., A8)	Not offered in 1928-29			
A21f,w	Design ..... (2 cred.; all H.E.; no prereq.)	III, IV	TTh	112HE	Miss Topp
A26f,w	House Planning and Furnishing ..... (3 cred.; all H.E.; prereq., A21)	VI, VII	MWF	106HE	Miss Topp
A31f	Selection and Preparation of Food ..... (3 cred.; all H.E.; no prereq.)				
	Sec. 1	I	MTWThF	105HE	Mrs. Aamodt
	2	VI	MTWThF	105HE	Miss Kafka
A31w	Selection and Preparation of Food ..... (Same as A31f)	VI	MTWThF	105HE	Miss Kafka
A32f,w	Meal Preparation ..... (3 cred.; all H.E.; prereq., A31)	III, IV	TThS	105HE	Miss Cremeans
A33f,w	Foods and Nutrition..... (2 cred.; jr., sr. H.E.; prereq., A32)	II	MTWTh	105HE	Miss Cremeans
A34f,w	Home Management ..... (3 cred.; sr. H.E.; prereq., A33)	III, IV	MWF	105HE	Mrs. Aamodt
A35w	Child Care and Training..... (2 cred.; sr. H.E.; prereq., A33, Prev. Med. A1)	II	MW	106HE	Mrs. Aamodt
A50f,w	Related Science I..... (3 cred.; all H.E.; no prereq.)	IV	MW	202So	Miss Cremeans
		III, IV	F	202So	
A51f,w	Related Science II..... (3 cred.; all H.E.; prereq., A50)	II	MW	202So	Miss Cremeans
		I, II	F	202So	
A73f,w	Food Selection and Preparation (2 cred.; all agr.; no prereq.)	VIII, IX	TTh	105HE	Mrs. Aamodt

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..... (3 cred.; jr., sr.; no prereq.)	II	MWF	8aHr	Mr. Daniels
A3w	Commercial Vegetable Gardening ..... (3 cred.; jr., sr. agr.; no prereq.)	II	TThS	8aHr	Mr. Daniels
A4w	Small Fruit Growing..... (3 cred.; jr., sr.; no prereq.)	II	MWF	102Hr	Mr. Daniels
A5f	Plant Propagation and Nursery Practice	I	MW	8aHr	Mr. Sando
	(3 cred.; all; prereq., Pl. Path. 1 or 4)	VIII, IX	T	8Hr	
A7w	Floriculture ..... (3 cred.; all; no prereq.)	IV	MWF	8aHr	Mr. Sando
A8f	Landscape Gardening ..... (2 cred.; all; no prereq.)	III	MW	8aHr	Mr. Cary
A10w	Greenhouse Construction, Management and Practice..... (3 cred.; jr., sr. agr.; prereq. A5)	VI, VII	MW	102Hr	Mr. Sando
A14w	Potato Production ..... (3 cred.; jr., sr. agr.; prereq., Agron. A2)	II	MWF	8aHr	Mr. Krantz
A15w	Special Problems ..... (Variable credit; prereq., instructor's permission)	Ar	Ar	Ar	Mr. Alderman and staff

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	3PP	Mr. Holton
	Rec.	VI	F	3PP	
	Lab.	VI, VII	W	3PP	
	Lect. 2	VII	W	3PP	Mr. Parson
	Rec.	VII	F	3PP	
	Lab.	VI, VII	M	3PP	
A2w	Seed Testing ..... (2 cred.; jr., sr. agr.; prereq., A1)	VI, VII	TTh	3PP	Mr. Larson
A4w	Agricultural Botany ..... (3 cred.; all H.E.; no prereq.)				
	Lect.	I	T	3PP	Mr. Holton
	Rec.	I	S	3PP	
	Lab.	I, II	Th	3PP	
A11f	Plant Diseases ..... (3 cred.; sr.; prereq., A1 or A4)	IV	MWF	1PP	Mr. Parson
A12f	Weeds ..... (2 cred.; jr., sr. agr.; prereq., A1)	VI, VII	TTh	3PP	Mr. Larson

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	
A3w	Incubating and Brooding..... (3 cred.; jr., sr.; prereq., A1)				
	Lect.	III	MF	201Ve	Mr. Smith
	Lab.	Ar	Ar	Ar	
A7f	Poultry Judging ..... (2 cred.; all; no prereq.)	VI, VII	MW	102Ve	
A10f	Dressed Poultry ..... (1 cred.; all; no prereq.)	Ar	Ar	Ar	

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. Hathaway
	2	III	S	103Ve	Dr. Hathaway

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 Holbrook
	3	III	MWF	307En	Miss Langtry
	4	II	TThS	312En	Miss Holbrook
A1w	English I ..... (Same as A1f)				
	Sec. 1	II	MWF	306En	Mrs. Hause
	2	IV	TThS	312En	Miss Holbrook
	3	I	MWF	306En	Ar

No.	Title	Hour	Day	Bldg.	Instructor
A2f	English II ..... (3 cred.; all; prereq., A1)				
	Sec. 1	II	MWF	312En	Miss Holbrook
	2	III	TThS	312En	Miss Holbrook
A2w	English II ..... (Same as A2f)				
	Sec. 1	I	MWF	312En	Miss Holbrook
	2	III	MWF	312En	Miss Holbrook
	3	III	TThS	312En	Miss Holbrook
	4	II	TThS	306En	Mrs. Hause
A3f	English Classics ..... (3 cred.; jr., sr.; prereq., A2)				
	Sec. 1	I	TThS	306En	Mrs. Hause
	2	III	MWF	312En	Miss Holbrook
	3	IV	MWF	312En	Miss Langtry
A3w	English Classics ..... (Same as A3f)				
	Sec. 1	II	MWF	312En	Miss Holbrook
	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 Lantry
	2	II	MWF	307En	Miss McNabb
	3	IV	TThS	312En	Miss Langtry
A5w	Public Speaking ..... (Same as A5f)				
	Sec. 1	I	MWF	307En	Miss Langtry
	2	III	TThS	307En	Miss McNabb
A6f	English VI ..... (3 cred.; sr.; prereq., A4)	II	TThS	306En	Miss Langtry
A6w	English VI ..... (Same as A6f) .				
	Sec. 1	II	MWF	307En	Miss Langtry
	2	III	TThS	306En	Miss Langtry
	3	IV	MWF	312En	Miss Langtry
A14f	Advanced Public Speaking.... (3 cred.; sr.; prereq., A5)	III	TThS	307En	Miss McNabb
A14w	Advanced Public Speaking.... (Same as A14f)	III	MWF	307En	Miss McNabb
A21f-22w	English Literature I, II..... (10 cred.; sr., prereq., A4)	VII	MTWThF	307En	Miss McNabb
A31f,w	Dramatics ..... (½ cred. under special conditions. See Faculty Regulations)	Ar	Ar	Ar	Miss McNabb

No.	Title	Hour	Day	Bldg.	Instructor
A32w	Debating ..... (1 cred.† under special conditions. See Faculty Regulations)	Ar	Ar	Ar	Miss Langtry

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
A1f,w	Farm Arithmetic ..... (3 cred.; all H.E.; no prereq.)				
	Sec. 5	II	TThS	107En	
A2f,w	Advanced Farm Arithmetic... (3 cred.; all; prereq., 1 or high school cred. in arith.)	IV	MWF	106En	Mr. Johnsrud
A4f	Algebra I ..... (7 cred.; all; no prereq.)	III	MTWThFS	217En	Miss Martyn
A4w	Algebra I ..... (Same as A4f)	IV	MTWThFS	217En	Miss Martyn
A5f	Algebra II ..... (7 cred.; all; no prereq.)	IV	MTWThFS	217En	Miss Martyn
A5w	Algebra II ..... (Same as A5f)	III	MTWThFS	107En	Miss Martyn
A6f,w	Geometry I ..... (7 cred.; all; no prereq.)	I	MTWThFS	217En	Miss Martyn
A7f,w	Geometry II ..... (7 cred.; all; prereq., algebra or parallel advised)	II	MTWThFS	217En	Miss Martyn
A21f,w	Elements of Music I..... (2 cred.; all; no prereq.)				
	Sec. 1	III	TTh	201MuH	Miss Dickerman
	2	VII	TTh	201MuH	Mrs. Larson
A22f,w	Elements of Music II..... (2 cred.; all; prereq., A21)	VII	TTh	202MuH	Miss Willson
A23f,w	Chorus ..... (½-3* 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 ..... (½-3* cred.; all; no prereq.)	Ar	Ar	302MuH	Mrs. Mertens
A25f,w	Piano ..... (½-3* cred.; all; no prereq.)	Ar	Ar	202MuH	Miss Willson
A26f,w	Instrumental Music ..... (½-3* cred.; all; no prereq.)	Ar	Ar	205MuH	Mr. Boland
A27f,w	Orchestra ..... (½-3* cred.; all; no prereq.)	6:30	TTh	201MuH	Mr. Boland

† No credit allowed until course is completed.

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

No.	Title	Hour	Day	Bldg.	Instructor
A28f,w	Voice ..... (½-3* cred.; all; no prereq.)	Ar	Ar	203MuH	Mrs. Larson
A29f,w	Harmony I ..... (2 cred.; all; prereq., A22)	II	TTh	202MuH	Miss Willson
A30f,w	Harmony II ..... (2 cred.; all; prereq., A29)	VII	TTh	202MuH	Miss Willson
A32f,w	Appreciation of Music..... (3 cred.; all; no prereq.)	VI	MWF	201MuH	Mr. Boland
A33f,w	Instrumentation and Conducting ..... (3 cred.; all; prereq., A22, 2 terms of A25 or A26)	Ar	Ar	201MuH	Mr. Boland
A34f,w	Band ..... (½-3* cred.; all agr.; no prereq.)	IX	MWF	MuH	Mr. Boland
A41f,w	Parliamentary Law ..... (1 cred.; jr., sr.; no prereq.)	I	S	202Ad	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.)	I	MWF	206Da	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	106En	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	WH	Miss Matson
A56f,w	Social Problems for Boys..... (1 cred.; all agr.; no prereq.)				
	Sec. 1	I	Th	202So	Miss Hognason
	2	II	T	202So	Miss Hognason
	3	III	S	202So	Miss Hognason
A61f,w	Spelling ..... (1 cred.; all; no prereq.)				
	Sec. 1	II	S	107Da	Miss Wade
	2	IV	S	107Da	Miss Wade
	3	VI	F	107Da	Miss Wade
A62f,w	Penmanship ..... (1 cred.; all; no prereq.)				
	Sec. 1	II	TTh	107Da	Miss Leavitt
	2	IV	TTh	107Da	Miss Leavitt
	3	VI	MW	107Da	Miss Leavitt
A80f,w	Typewriting I ..... (3 cred.; all; no prereq.)				
	Sec. 1	III, IV	MWF	106Da	Miss Leavitt
	2	III, IV	TThS	106Da	
	3	VI, VII	MWF	106Da	
	4	I, II	MWF	106Da	
	5	I, II	TThS	106Da	

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

No.	Title	Hour	Day	Bldg.	Instructor
A81f,w	Typewriting II ..... (3 cred.; jr., sr. H.E.; prereq., A80)				
	Sec. 1	I, II	MWF	106Da	Miss Leavitt
	2	VI, VII, VIII	TTh	106Da	
A82f,w	Typewriting III ..... (3 cred.; jr., sr. H.E.; prereq., A81)	VI	MWF	106Da	Miss Wade
A83f,w	Stenography I ..... (3 cred.; all H.E.; no prereq.)	IV	MWF	106Da	Miss Wade
A84f,w	Stenography II ..... (3 cred.; jr., sr. H.E.; prereq., A83)	III	MWF	106Da	Miss Leavitt
A85f,w	Stenography III ..... (3 cred.; jr., sr. H.E.; prereq., A84)	II	MWF	106Da	Miss Wade
A86f,w	Bookkeeping I ..... (3 cred.; all; no prereq.)	VI, VII, VIII	TTh	105Da	Miss Wade
A87f.w	Bookkeeping II ..... (3 cred.; all; prereq, A86)	III, IV	TThS	105Da	Miss Wade
A88f.w,	Commercial Law ..... (3 cred.; all; no prereq.)	II	MWF	202Ad	Mr. Mayne

SOILS

No.	Title	Hour	Day	Bldg.	Instructor
A1f,w	Soils ..... (3 cred.; all agr.; no prereq.)				
	Sec. 1	I	TTh	201So	Mr. Nesom
		I, II	S	201So	Mr. Nesom
	2	IV	TTh	201So	Mr. Nesom
		III, IV	S	201So	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. Fitch
A5f	Physiology and Hygiene of Breeding ..... (2 cred.; jr., sr. agr.; no prereq.)	II	WF	103Ve	Mr. Boyd
A7f	Veterinary Studies I..... (3 cred.; jr., sr. agr.; no prereq.)	I	MWF	102Ve	Mr. Reynolds
A8w	Veterinary Studies II..... (3 cred.; jr., sr. agr.; no prereq.)	I	MWF	102Ve	Mr. Reynolds

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1928

JULY

Su	Mo	Tu	W	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	..	..	..	..
..	..	..	..	..	..	..

AUGUST

Su	Mo	Tu	W	Th	Fr	Sa
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SEPTEMBER

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OCTOBER

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DECEMBER

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1929

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MARCH

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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SCHOOL CALENDAR

1928-29

1928			
June	18-21		Third Annual Women's Camp
October	1	Monday	Registration
October	2	Tuesday	Organization of classes
October	27	Saturday	Home Coming Day
November	29	Thursday	Thanksgiving Day
December	21	Friday	First term closes: Christmas recess begins
1929			
January	7	Monday	Registration of new students
January	8	Tuesday	Second term begins; organization of classes
February	4-8	Week	Northwest School Farmers' Week
March	29	Friday	School term closes
April	1-5	Week	Junior Short Course

COMMENCEMENT WEEK

March	23	Saturday	Interclass field meet
March	24	Sunday	Baccalaureate address
March	25	Monday	Intersociety declamatory contest
March	26	Tuesday	Superintendent's reception to graduating class
March	27	Wednesday	Musical recital and class play
March	28	Thursday	Class Day exercises and commencement

FACULTY

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

AT CROOKSTON

ADMINISTRATION

Austin A. Dowell, M.S., Superintendent
Arthur H. Larson, B.S., Registrar
Fanny B. Lippitt, B.S., Director of Dining Hall
Elesa Simonson, R.N., School Nurse
Vivian Sanders, Secretary
Kate Bedard, Accountant

AGRICULTURAL ENGINEERING

Arnold M. Foker, Carpentry and Farm Engineering
Howard C. Rutt, Farm Motors and Mechanics
Severin Rishovd, Assistant in Farm Motors and Mechanics

AGRONOMY

Ray S. Dunham, B.S., Farm Crops and Soils
Elmer R. Clark, B.S.A., Pure Seed Work and Home Projects

ANIMAL HUSBANDRY

Orville M. Kiser, B.S.A., Animal and Dairy Husbandry
Delmar H. LaVoi, B.S.A., Animal Husbandry and Physical Training
Alvey M. Pilkey, Poultry

HORTICULTURE

Thomas M. McCall, B.S.A., Horticulture

HOME ECONOMICS

Fanny B. Lippitt, B.S., Foods and Nutrition
Retta Bede, B.S., Foods and Cookery
Laura Gerber, B.S., Clothing and Textiles
Elesa Simonson, R.N., Nursing

ASSOCIATED SUBJECTS

Edward W. Avery, B.S., Advanced Subjects, Debate
Helen M. Brown, B.A., Music and Vocal Training
DeEtte Cenfield Genung, B.O., English
Fae Hughbanks, Business Training
Arthur H. Larson, B.S., Academic Subjects
Henry A. Pflughoeft, B.S., Boys' and Girls' Club Work
Rose C. Polski, B.A., Piano
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 1, 1928, and classes will begin at 8 o'clock on Tuesday, October 2. The fall term closes on December 21, 1928.

The winter term will open for registration on January 7, and classes will begin at 8 o'clock on January 8, 1929. The winter term closes March 29, 1929.

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 16 and 25. 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 dressmaking, 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 1, or Monday, January 7. Dormitories will not be open before that time and the first meal in the dining hall will be served 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 of 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 nightgowns.

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 middy 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 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
For non-residents of Minnesota	10.00
Deposits as guarantee of proper treatment of school property	5.00
Health fee for 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 assembly 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 7, 1929.

JUNIOR SHORT COURSE

The eighteenth annual Junior Short Course, from April 1 to April 5, 1929, 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-day meeting at this time held under the auspices of the Northwest School serves the purpose of the original short course.

WOMEN'S CAMP

The third annual Women's Camp will be held at the Northwest School June 18-21, 1928, to provide instruction and recreation for homemakers. Instruction in the form of demonstrations will be offered in homemaking, 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 16 to 25.

FIRST YEAR
Required of All

Fall Term

Credit Hours	
5	English A
5	Livestock*
	Farm Dairying A
	Poultry B
5	Farm Crops*
	Botany A
5	Arithmetic A*
	Gymnasium and Personal Hygiene A
1	Social Training C*
5	Elective from the following:
26	
5	Blacksmithing B*
5	Farm Motors I
5	Farm Mechanics G*
5	Industrial Geography A
1	Music B
3	Typewriting I F
5	Shorthand C
4	Music A

Spring Term

Credit Hours	
5	English A
5	Livestock*
	Study of Breeds H
	Poultry B
5	Farm Crops*
	Cereal Crops A
5	Arithmetic A*
	Gymnasium and Personal Hygiene A
1-5	Summer Home Projects
5	Elective from the following:
25	
2	Spelling and Penmanship E*
5	Carpentry C*
5	Farm Motors J
5	Industrial History B
1	Music B
3	Typewriting I F
5	Shorthand C
4	Music A

Students having a State Board certificate in arithmetic need not take that subject.

SECOND YEAR
Required of All

Fall Term

Credit Hours	
5	English B
5	Livestock
	Stock Feeding E
	Stock Judging G
	Poultry J
5	Farm Crops
	Fruits and Vegetable Crops C
5	Agricultural Chemistry C
	Gymnasium
5	Elective from the following:
25	
5	Ancient History C
5	Mechanical Drawing E*
3	Field Machinery H
1	Music B
3	Typewriting II F
5	Shorthand D
3	Advanced Carpentry D
3	Beekeeping E
4	Music A

Spring Term

Credit Hours	
5	English B
5	Livestock
	Stock Feeding F
	Stock Judging G
5	Farm Crops
	Forage Crops B
2½	Farm Accounts E
2½	Forestry D
	Gymnasium
1-5	Summer Home Projects
5	Elective from the following:
25	
5	Bookkeeping A
5	Modern History C
1	Music B
1	Parliamentary Law E
3	Typewriting II F
5	Shorthand D
3	Farm Drawing F
4	Music A

* Will be offered both terms.

THIRD YEAR
Required of All

Fall Term		*Spring Term*	
Credit Hours		Credit Hours	
5	English C	5	English C
5	Livestock Herd Management C	5	Livestock Livestock Production D Poultry K
5	Farm Crops Soils Management D 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, or 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, except in shop work, where the minimum is eight students.

HOMEMAKERS' COURSE

FIRST YEAR

Required of All

Fall Term

Credit Hours	
5	English A
3	Physiology and Public Health C
4	Foods and Cookery A
3	Elementary Garment Making P
1	Drawing and Design M
1	Music B
1	Social Training I
	Physical Training C
6	Elective from the following:
24	

Spring Term

Credit Hours	
5	English A
5	Arithmetic A*
2	Public Health C
4	Foods and Cookery A
3	Garment Making P
1	Music B
	Physical Training D
1-5	Summer Home Projects
5	Elective from the following:
25	

General and Agricultural Electives

5	Industrial Geography A
5	Poultry L*
4	Music A
5	Botany*
3	Farm Dairying B*
5	Industrial History B
4	Music A

Office Training Electives

2	Spelling E / Penmanship E
5	Shorthand C
3	Typewriting I G
2	Spelling E / Penmanship E
5	Shorthand C
3	Typewriting I G

SECOND YEAR

Required of All

Fall Term

Credit Hours	
5	English B
4	Foods and Cookery B
2	Textiles R
4	Elementary Dressmaking O
2	Home Nursing E
1	Music B
	Physical Training E
1	Costume Design L
5	Electives
24	

Spring Term

Credit Hours	
5	English B
3	House Planning and Furnishing J
2	Home Nursing E
3	Dressmaking N
1	Music B
	Physical Training E
1-5	Summer Home Projects
10	Electives
24	

General and Agricultural Electives

5	Ancient History C
5	Fruit and Vegetable Crop C
4	Music A
3	Beekeeping E
5	Mechanical Drawing E*
5	Agricultural Chemistry C
2	Laundering Q
5	Modern History C
1	Parliamentary Law E
4	Music A
2½	Farm Forestry D

Office Training Electives

5	Shorthand D
3	Typewriting II F
5	Shorthand D
3	Typewriting II F
5	Bookkeeping A

* Will be offered both terms.

THIRD YEAR
Required of All

Fall Term		*Spring Term*	
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

2	Household Accounts F	2	Floriculture B
2	Nutrition H	5	Farm Management F
4	Music A	4	Music A
5	Civics D	5	Physics A
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

Fall Term		*Spring Term*	
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. Agricultural Chemistry. 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' home 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. Atten-

tion is given to building materials, estimates of costs, and specifications. Mr. Foker.

G. Farm Mechanics. Practical work in soldering, pipe fitting, babbitting, and bearing scraping; rope work, belt lacing, and harness repair. Mr. Rutt, 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. Rutt, 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. Rutt, 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. Rutt, 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, study of pedigrees, herd books, and method of registration. Problems of sanitation and disease. Mr. Kiser.

D. Livestock Production. Statistical studies of the livestock situation. The livestock market, market demands, and market classes. Study of daily livestock market reports. Mr. Kiser.

E. Stock Feeding. Prerequisite, study of breeds. 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, formation 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. Comparative judging. Discussions on the

subjects of type, market classes, and utility values of animals. 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 poultry, including turkeys, ducks, and geese. Selection and management of the laying flock. Natural and artificial incubation and brooding. 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. Botany. 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 gardens 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 composition, with particular attention to sentence structure, punctuation, and spelling. Letter writing. Drills for the purpose of eliminating errors. The reading of simple classics to create a love for literature. Silent reading is taught to train the student to read quickly and accurately and thus speed up the thought getting process and develop the habit of concentration. 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. Miss Simonson.

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. Miss Simonson.

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 machinery 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, Voice, 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, Miss Warne.

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, butter 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. 3 to 5 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 for one season. 5 credits. Mr. Clark.
11. Poultry Production. Feeding and care of the 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.
18. Plant Identification. Identification and classification of weeds. 5 credits. Mr. McCall.

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

1927-28

Regular School Course	Men	Women	Total
Advanced	21	11	32
Seniors	33	24	57
Juniors	51	16	67
Freshmen	97	26	123
Special	5	14	19
	207	91	298
Women's Camp, 1927	....	129	129
Junior Short Course, 1928	142	112	254
Cow Testers' Short Course	25	....	25
Total	374	332	706

STUDENTS

1927-28

ADVANCED

Rolf Anderson, Fisher
*Lillian Bakken, Erskine
Sophie Breiland, Hazel
Hannah Degerness, Gary
Annie Dunbar, Lancaster
*Esther Engbretson, Clearbrook
Chester Engman, Hallock
*Gladys Gunderson, Gary
Manford Halvorson, Gary
Ralph Hamrick, Angus.
Melvin Hole, Dalton
Arthur Johnson, Callaway
*Glenn KenKnight, Clearbrook
*Edward Logelin, Clearbrook
Morriel Mortensen, Pencer
*Lloyd Mylerberg, McIntosh
Randolph Ostlie, Montevideo
Loren Parkin, Euclid
*George Roisum, Bagley
*Erma Ross, Crookston
*Gertrude Schaack, Plummer
*Roy Seaberg, Audubon
Benneth Sharpe, Shelly
Glenn Smith, Bluffton
Ruth Soltis, Tabor
Lawrence Spears, Shooks
Olaf Stenborg, Clearbrook
Ivan Suchomel, Ogema
Bessie Swenson, Crookston
Ruth Thorssen, Gully
Carl Widseth, Gonvick
Russell Younggren, Northcote

SENIORS

Lester Aase, Gatzke
Wilfred Bakken, Twin Valley
Selma Beiswenger, Kratka
George Berggren, Greenbush
Marie Bernath, Pembina, N.Dak.
Esther Blair, Bagley
Elon Bryngelson, Callaway
Carrie Buck, Crookston
Laura Buck, Crookston
Bennie Burk, Brooks
Melvin Burk, Brooks
Theodore Carlson, Hallock
Harry Confer, Angus
Isabelle Dobias, Angus
Paul Dobias, Angus
Elida Erickson, Clearbrook
Irvin Flynn, Leonard
Ruth Hamre, Gary
Ethel Harris, Crookston
Henry Heathman, Shevlin
Arnold Hendricks, Fertile
Carl Hogenson, Winger
Sophie Hoper, Stephen
Palma Hornseth, Thief River Falls
Helen Hovland, Crookston
Gordon Hunt, Thief River Falls
Rudie Johnstad, Beltrami
Louis Larson, Hazel
Manley Larson, Twin Valley
George Lee, Hendrum
Glenn Lindquist, Wylie
Esther Lundin, Stephen
Edythe Martinson, Kennedy
Vickie Maruska, Angus
Julia Miller, Goodridge
Alta Morrill, Brown Valley
Erwin Nelson, Grygla
Clara Ness, Wanke
Ernest Newhouse, Crookston
Harold Norseth, Wanke
Telmer Olson, Waubun
Anna Osmundson, East Grand Forks

* Graduates also of the three-year course.

Viola Parduhn, Cedar Bend
Lawrence Philipp, Germantown
Harold Roadfeldt, Salol
Martin Rostvold, Grygla
Arthur Sandal, Syre
Irene Schell, Pencer
Harriet Skjerva, Hawley
Lowell Spokely, Nielsville
Clayton Stordahl, Gatzke
Adele Strom, Gary
August Thorkelson, Gatzke
Chester Torgerson, Fergus Falls
Edwin Trandem, Mentor
Esther Veker, Fertile
Elmer Wardeberg, McIntosh

JUNIORS

Hilma Ahlm, Argyle
Orville Anderson, Hallock
Evelyn Bain, Baudette
Oscar Bestland, East Grand Forks
Richard Brown, Warroad
Williamine Cenfield, Clinton
Meldor Christianson, Fertile
Harold Cordes, Henning
John Dexheimer, Gary
Iver Eklund, Gilbert
Earl Ellinger, Crookston
Gordon Ellinger, Crookston
Lawrence Elton, Hawley
Henning Erickson, Twin Valley
Harvey Evenson, Climax
Estelle Filipi, Angus
Mabel Fletcher, Bagley
Stanton Gandrud, Detroit Lakes
Esther Gibbons, Crookston
Iris Gibbons, Crookston
Rudy Gorden, Badger
Jetle Gullekson, Beltrami
Florence Hanson, Mentor
Sanna Hanson, Wanke
Burdeen Hoiland, Halstad
Mervin Hough, Bagley
Clarence Howard, Goodridge
Agnes Johnson, Fisher
Elmer Johnson, Erskine
Harvey Johnson, Rollag
Mary Johnson, East Grand Forks
Olga Johnson, Plummer
Wilfred Knutson, Clearbrook
Winton Knutson, Thief River Falls
Julian Kolden, Erskine
Alma Krogstad, Fertile
Medore LaChance, Red Lake Falls
Fordyce Larson, Ulen
Robert Larson, Crookston
Max Leiser, Fertile
Norman Lewis, Warroad
William Lohn, Winger
Kenneth McNown, Barnesville
Clay Mellor, Brooks
Lauritz Mikkelson, Hawley
Elmer Mortensen, Pencer
Alice Naplin, Wylie
Oscar Norbom, Clearbrook
Martin Odland, Wadena
Lawrence Omundson, Thief River Falls
Abraham Paquin, Oklee
Eva Parduhn, Cedar Bend
Arthur Peterson, East Grand Forks
Stanley Radniecki, Wanke
Robert Reed, Esplee
Kenneth Rice, Bronson
Lowell Ryden, Hallock
Alvin Schell, Pencer
Raymond Schlauderaff, Detroit Lakes
Perry Sevald, Winger
Hazel Stephenson, Gary
Juel Stephenson, Pelican Rapids
Emmet Torkelson, Crookston
Howard Ward, Hallock
Lloyd Weaver, Williams
Lynn Williams, Gatzke
Chester Yergens, McIntosh

FRESHMEN

Freeman Allen, Thief River Falls
Theodore Anden, Fergus Falls
Ellen Anderson, Stephen
Ivan Anderson, Greenbush
Harold Banks, East Grand Forks
Joe Barta, Hawley
Harold Bendix, Henning
Alice Berg, Erskine
Alvin Berg, Crookston
Conrad Berg, Twin Valley
Willard Bitzer, Graceton
Gladys Bradley, Erskine
Loren Braton, Barnesville
Vernon Bryngelson, Callaway
Bud Buus, Crookston
Thomas Cain, Ponemah
Clarence Carlson, Stephen
Harold Carroll, Dugdale
Ralph Cartwright, Shevlin
Johanna Caudle, Crookston
Otelia Coltom, Strathcona
Willard Coss, Hiwood
Marie Dablow, Thief River Falls
Melvin Dale, Fertile
Alvin Degerness, Gary
Blanche DePochee, Pelican Rapids

Harold Dokken, Lockhart
Crystle Edgar, Bagley
Clarence Eidenschink, Detroit Lakes
Chester Enger, Halstad
Alice Erickson, Pencer
Anna Erickson, Wannaska
Lambert Erickson, Goodridge
Raymond Erickson, Kennedy
Orville Flikke, Shelly
Kenneth Flom, Twin Valley
Grantley Gabrielson, Duluth
Theodore Gervais, Crookston
Erwin Gilbertson, Pelican Rapids
Arnold Gredvig, Fertile
Arthur Hansel, Dalton
Arnold Hansen, Thief River Falls
Esther Hanson, Hawley
Herschel Harris, Crookston
Clifford Hendrickson, Gary
Ernest Henstorf, Menahga
Fabian Hermann, Georgetown
McLean Hetland, Halstad
Osborn Hoiland, Halstad
Arthur Holm, Winger
Harvey Hovland, Crookston
John Hovorka, Strathcona
Earl Johnson, Middle River
Halbert Johnson, Underwood
Alice Josephson, Wanke
Harmen Juelson, Fertile
Verner Karlin, Hawley
Mearl Keeler, Warroad
Orris Knutson, Ulen
Cora Koppang, Climax
Evinda Koppang, Climax
Emma Krogstad, Fertile
John La Bonte, Gentilly
Leonard Laurent, Gentilly
Daniel Letnes, Crookston
Isabelle Letnes, Crookston
Clifford Lindquist, Wylie
Leo Maattala, Oklee
Vaughn Martin, Grand Forks, N. Dak.
Einar Martinson, Esplee
Harold Miller, Roseau
Helga Moe, East Grand Forks
Harold Moen, Halma
Joseph Mortenson, Underwood
Clinton Nelson, Glentana, Mont.
Eugene Nelson, Glentana, Mont.
Harold Nelson, Hawley
John Nelson, Winger
Boyd Ness, Wanke
Herbert Nisbet, East Grand Forks
Bjarne Norness, Winger
Roy Nyberg, Kennedy
Eivind Ode, Westbury
Gaylord Odegaard, Detroit Lakes
Clifford Olson, Halstad
Wallace Olson, Halstad
Raymond Omberg, Hawley
Arthur Omdahl, Halstad
Roald Opdahl, Twin Valley
Archie Overgaard, Dalton
Clarence Pallas, Barnesville
Melba Parduhn, Cedar Bend
Effie Pederson, Clitheral
Clarence Peterson, Hawley
Ernest Peterson, Georgetown
Evert Peterson, Brooks
Lawrence Peterson, Gary
George Pishney, Silver Lake
Stanley Quade, Moorhead
Alfred Rasmussen, Crookston
Ralph Robidoux, Brooks
Annette Rots, Clitheral
Francis Ryan, Haug
James Rynning, Kennedy
Odean Sandland, Clearbrook
Justine Sannes, Thief River Falls
Aslaug Satre, Grygla
Neal Scott, Lengby
Agnes Sevald, Winger
Marvin Simmons, Crookston
Wesley Sorn, Hallock
Lillian Stepp, Williams
William Strickler, Euclid
Arthur Sundrud, Fosston
Melvin Sundrud, Fosston
Earl Swenson, Fosston
Lester Tangjerd, Bagley
Marie Tastad, Gary
Orrin Torgerson, Fosston
Carl Vik, Halma
Selma Waldal, Plummer
Marvin Wardner, Fisher
Arthur Widseth, Gonvick

SPECIAL

Evelyn Beaudry, Red Lake Falls
Zoe Brouillard, Crookston
Viola Buringrud, Thief River Falls
Leonard Burtness, Ulen
Hannah Dowell, Crookston
Margaret Dowell, Crookston
Margaret Driscoll, Crookston
Dorothy Foker, Crookston
Lulu Jasa, Donaldson
Joy Kiser, Crookston
Donald McCall, Crookston
Robert McCall, Crookston
Barbara Miller, Crookston
Claire Miller, Crookston
Adeline Oveson, Crookston
Joseph Skatvold, Twin Valley
Kristian Stokke, Crookston
Cleo Trulson, Crookston
Ethel Wentzel, Crookston

The Bulletin *of the* University *of* Minnesota

West Central School and Station
Morris, Minnesota

Announcement for the Year
1928 - 1929

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SCHOOL CALENDAR

1928-29

1928			
October	1	Monday	First term opens; registration
October	2	Tuesday	Organization of classes
November	3	Saturday	Visitors' Day
November	10	Saturday	Field Day
November	29	Thursday	Thanksgiving Day; a holiday
December	22	Saturday	First term closes; Christmas vacation begins
1929			
January	7	Monday	Christmas vacation ends; second term opens; registration
January	8	Tuesday	Organization of classes
February	12	Monday	Lincoln's Birthday (special exercises)
February	22	Wednesday	Washington's Birthday (special exercises)
March	22	Friday	Annual Music Pupils' Recital
March	24	Sunday	Baccalaureate Service
March	25	Monday	Annual Concert Recital
March	26	Tuesday	Senior Class Play
March	28	Thursday	Junior-Senior Alumni Banquet
March	29	Friday	Commencement Exercises
April	1	Monday	Boys' and Girls' Club Week opens
April	4	Thursday	Boys' and Girls' Club Week closes
June	11	Tuesday	Short Course for Farm Women opens
June	14	Thursday	Short Course for Farm Women closes

FACULTY

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

AT MORRIS

ADMINISTRATION

Paul E. Miller, M.Agr., Superintendent
Edwin J. Volden, Registrar
Winifred Tyner, B.A., Librarian
Gladys E. Hinson, B.S., Director of Dining Hall
Alma H. Peterson, R.N., School Nurse
Margaret Stamness, Accountant
Hazel A. Melsberg, Secretary

AGRICULTURAL ENGINEERING

Albert C. Heine, Physics, Farm Mechanics
Alex B. Rolfe, Forge and Welding
Ernest L. Kleckner, B.S., Automotive Mechanics and Farm Drainage
Julius Felt, Carpentry and Farm Structures

AGRONOMY

Roy O. Bridgford, B.S., Farm Crops and Soils
Allen W. Edson, B.S., Farm Management
Julius Jellum, Assistant in Agronomy

HORTICULTURE

John A. Anderson, B.S.A., Botany and Horticulture
Gust Peterson, Gardener

ANIMAL HUSBANDRY

Philip S. Jordan, B.S., Animal and Dairy Husbandry
Allen W. Edson, B.S., Poultry and Bees
Theodore Grotjohn, Herdsman

HOME ECONOMICS

Gladys E. Hinson, B.S., Foods and Cookery
Gladys E. Nordeen, B.S., Foods and Home Management
Alma H. Peterson, R.N., Nursing
Tone E. Halvorson, B.S., Dressmaking and Millinery
Bessie L. Schranek, B.S., Clothing and Applied Art

ASSOCIATED SUBJECTS

Theodore S. Long, B.A., English, Public Speaking
Nanna Jelstrup, English, Mathematics
Dorothea Reiter, B.A., English, Physical Training
Edwin J. Volden, Mathematics
Glenn I. Prickett, B.A., History
Martin J. Sorflaten, B.A., Music
————————, 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 1, and close Saturday, December 22. The winter term will open Monday, January 3, and close Friday, March 29. 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, kimono, apron, and bedroom slippers, laundry bag, gymnasium suit, and tennis 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 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. To those who are unable to make the bloomers at home, assistance will be given 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 two weeks. 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
Gymnasium fee	.25
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 extra nurses in case of serious sickness, where such are necessary, or extra costs caused by epidemics; nor does it provide for physician's calls. These must be paid for by the student securing the service.

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 deportment.

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 may 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. A 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 organizations 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 Agricolae 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 of 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

The Dorr 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 and scholarships 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 scholarships mentioned, 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, also, are 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 contestants, 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 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 page 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 1929 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, 1929.

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 18 to 27.

See page 12 for description of 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, 1 Blacksmithing II, 2 Piano, 2 Violin, 2 Chorus, 1 Orchestra, 1

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	
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	Garden and Orchard, 5 Corn and Grain Judging, 2 Mechanical Drawing, 2 Farm Drainage, 5 Stock Judging II, 1 Beef Production, 3 Elementary Beekeeping, 3	First term only
	Adv. Poultry Production, 3 Public Speaking, 3 Piano, 2 Violin, 2 Orchestra, 1 Glee Club, ½	May be taken either term
	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 Advanced Shop Practice, 1	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
	Rural Sociology, 3 Bookkeeping II, 5 Advanced Electricity, 3 Farm Marketing, 3 Animal Diseases, 3 Incubation and Brooding, 3 Commercial Law II, 5 Advanced Shop Practice, 1	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

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 Shorthand I, 5 Typewriting, 2 Chemistry I, 5 Applied Art I, 2	First term only
	Textiles, 3 Nursing III, 3 Algebra II, 5 Shorthand II, 5 Typewriting, 2 Chemistry II, 5 Horticulture, 5 Applied Art II, 2	Second 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
Required—second term	English VI, 5 Government, 5 Dressmaking IV, 3 Gymnasium, 1

*Students taking business training electives will register in the five-hour course.

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 General History I, 5 Applied Art I, 2	First term only
	Rural Sociology, 3 Chemistry II, 5 Algebra II, 5 Geometry II, 5 Horticulture, 5 Dictation II, 5 Commercial Law II, 5 Bookkeeping II, 5 Physics I, 5 General History II, 5 Applied Art II, 2	Second term only
	Beekeeping, 3 Poultry, 3 Public Speaking, 3 Glee Club, ½ Chorus, 1 Musical (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 General History I, 5
Required—second term	Plane Geometry II, 5 Elementary Algebra II, 5 English VIII, 5 General History II, 5 Botany, 5
Electives	Solid Geometry, 5 Advanced Algebra, 5 Rural Sociology, 3 Bookkeeping III, 5

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, $1.50.

Carpentry II. Continuation of Course I. Lab. 2, 2 hrs.; 2 credits; fee, $1.75.

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, $2.

Blacksmithing II. Continuation of Blacksmithing I. Lab. 2, 2 hrs.; 2 credits; fee, $3.

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. 1, 2 hrs.; 1 credit; fee, $1.50.

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. Lab. 2, 2 hrs.; 2 credits; fee, $1.

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; fee, $1.

Automotive Engineering. A study of internal combustion engines with emphasis placed on tractor, truck, and automobile engines. A careful study of carburetion, ignition, lubrication, and cooling systems. Practice is given in the repair and adjustment of all automotive equipment. Rec. 2 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, 2 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; fee, 25 cents.

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, and tempering. Rec. 3 hrs.; lab. 4 hrs.; 5 credits; fee, 50 cents.

Advanced Shop Practice. Laying out exercises, micrometer reading, working to scale, setting up lathe, adjusting chucks, lathe practice, including thread cutting, bench work supplementary to lathe work, use of reamers, etc. Lab. 2 hrs.; 1 credit.

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 deportment, 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.

Algebra III. Continuation of Course II. 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.

Solid Geometry. Planned to cover the usual course in this subject. 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 offered to all boys who live in school dormitories. The gymnasium with its facilities is kept open every afternoon and evening for the use of students. A 25-cent fee is charged all students for maintaining the gymnasium.

SOCIAL SCIENCE

General History I. A study of world history during the ancient and medieval periods to the French Revolution, and designed to show the social and political development of men and nations during these periods. Rec. 5 hrs.; credits, 5 hrs.

General History II. A continuation of Course I from the French Revolution to the present time, with special emphasis on the growth and development of nationalism and democratic and liberal reforms during this period. Rec. 5 hrs.; credits, 5 hrs.

United States History. A course intended to present a clear account of the colonial backgrounds of the United States with greater emphasis on the recent industrial, economic, and social development of our nation. Rec. 5 hrs.; 5 credits.

United States Government. A limited study of the departmental organization and function of the national, state, and local government. Rec. 5 hrs.; 5 credits.

Rural Sociology. A limited study of the backgrounds of sociology. Rural social institutions, and existing rural problems. Rec. 3 hrs.; 3 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 credits; 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 credit.

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 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: Streabbog'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 Frederic Haywood is the basis for this with selections from the following studies: Marzo, Sieber, Concone, Marchesi, Panofka, 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, Shoebruck, 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.

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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.....

Bulletin *of the* University *of* Minnesota

The Law School

Announcement for the Years 1928-1930

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Act of October 3, 1917, authorized July 12, 1918

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 62 of the 176 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

1928-29

Fall Quarter

1928			
September	20	Thursday	Payment of fees closes, except for new students
September	27-28		Registration days[1] for Law School
September	28	Friday	Payment of fees for new students closes
October	1	Monday	Fall quarter classes begin, 8:30[2] a.m.
October	20	Saturday	Homecoming Day
November	6	Tuesday	Election Day; a holiday
November	12	Monday	A holiday; (November 11, Sunday, Armistice Day)
November	29	Thursday	Thanksgiving Day; a holiday
December	6	Thursday	State Day Convocation
December	20	Thursday	Commencement Convocation
December	22	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	26	Wednesday	Payment of fees closes for all students in residence fall quarter[3]

Winter Quarter

1929			
January	7	Monday	Christmas vacation ends, winter quarter classes begin, 8:30[2] a.m.
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Charter Day Convocation
February	22	Friday	Washington's Birthday; a holiday
March	21	Thursday	Commencement Convocation
			Payment of fees closes for all students in residence winter quarter[1]
March	23	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

Spring Quarter

March	29	Friday	Good Friday; a holiday
April	1	Monday	Spring vacation ends, spring quarter classes begin, 8:30[2] a.m.

[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 44.

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

May	16	Thursday	Cap and Gown Day Convocation
May	30	Thursday	Memorial Day; a holiday
June	12-15		Final examination period
June	15	Saturday	Spring quarter closes, 5:20 p.m.
June	16	Sunday	Baccalaureate service
June	17	Monday	Fifty-seventh annual commencement

Summer Quarter

June	18-19		Registration, first term
June	20	Thursday	Classes begin, 8:00 a.m.
July	4	Thursday	Independence Day; a holiday
July	27	Saturday	Registration and payment of fees for second term closes. First term closes
July	29	Monday	Second term classes begin
August	31	Saturday	Second term closes

FACULTY

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Everett Fraser, B.A., LL.B., Dean of the Law School and Professor of Law
Wilbur H. Cherry, B.A., LL.B., Professor of Law
Ralph H. Dwan, B.A., LL.B., S.J.D., Assistant Professor of Law
Oliver P. Field, M.A., LL.B., S.J.D., Associate Professor of Political Science
Henry J. Fletcher, LL.M., Professor of Law
Harvey S. Hoshour, B.A., LL.B., Professor of Law
Henry L. McClintock, Ph.B., LL.B., S.J.D., Professor of Law
James Paige, M.A., LL.M., Professor of Law
Harold S. Quigley, Ph.D., Professor of Political Science
Henry Rottschaefer, B.A., J.D., S.J.D., Professor of Law
John F. Bonner, LL.B., Instructor in Practice
David E. Bronson, B.A., LL.B., Instructor in Practice
Paul S. Carroll, B.A., LL.B., Instructor in Practice
Samuel H. Maslon, B.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
Hugh V. Mercer, LL.M., D.C.L., Minneapolis
George W. Strong, LL.B., Minneapolis
Arthur C. Pulling, Law Librarian

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.

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.

LAW BUILDING

The Law School will occupy a new building in 1928-29. It is situated on the east bank of the Mississippi near the center of the campus. It contains four classrooms, a reading room 140 by 50 feet capable of seating 260 students, stackroom for 100,000 volumes, offices of instructors, Law Review room, and rooms for men and women students. The building is fully equipped and admirably suited for the work of a modern law school.

LIBRARIES

The library of the Law School contains 46,000 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. The State Law Library, located at the Capitol in St. Paul, is also accessible to students in the Law School.

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.

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 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.

ORDER OF THE COIF

The school has a chapter of the Order of the Coif, a national honorary society of law students. Election to the society is made by the faculty at the close of the senior year, from the ten per cent of the graduating class highest in scholarship.

SCHOLARSHIPS AND AIDS

Scholarships of $150 each are offered by the Law Alumni Association, the *Minnesota Law Review*, and the faculty of the Law School, to the students in the senior class for meritorious work in the course and on the *Minnesota Law Review*. Several readerships of $120 each are also available to high rank students of the senior class. Loan funds available to law students are listed in the bulletin of general information.

SUMMER SESSION

A program of law studies for both beginning and advanced students is offered during the Summer Session. The session is divided into two terms of six and five weeks. Beginning students must attend both terms to receive credit, but advanced students can complete a program in either term. Credits may be earned towards a degree, and the work is so arranged that a student may complete a year of work by attending three successive summer sessions. The work offered in summer is the same as that given in the same subjects in the regular session. Instruction is given by members of the law faculty and distinguished teachers from other law schools. The Summer Session of 1929 will begin June 18 and end August 31. The courses will be announced in a separate bulletin which will be sent on application.

ADMISSION

Candidates for admission to the Law School must have completed at least two years of work in the College of Science, Literature, and the Arts of the University of Minnesota, or some other accredited college or uni-

versity. The minimum requirement is 90 quarter (60 semester) credits. The candidate must also have made an average of one honor point for each credit in all his college work. 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.

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
2. Rhetoric, English A-B-C
3. Natural science, 10 credits
4. Political Science 1
5. Philosophy 2, and 50-51
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.

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 an average of one honor point for each credit in all his college work, 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. The first two years of this course may be taken in another accredited college, but the third year must be taken in the College of Science, Literature, and the Arts of this University. Several Minnesota colleges permit students who have completed three years of work to transfer to this Law School and accept the first year of law in completion of their requirements for their bachelor of arts 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 36 credits (one year's work), as the law faculty may designate.

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 Arts[1] 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 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.

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.

REGISTRATION

New students will be admitted only at the opening of the school year,[2] or of the Summer Session. All students should register on or before the registration period stated in the university calendar. 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 10.)

[1]These requirements are stated in full in the current bulletin of the College of Science, Literature, and the Arts.

[2] See general information bulletin, page 44, for the provisions as to penalty for late registration.

FEES

Quarterly resident tuition fees	$40.00
Quarterly non-resident tuition fees	50.00
Credit hour fee (resident)	3.75
Credit hour fee (non-resident)	4.75
Quarterly incidental fee	6.00
Deposit fee (first quarter only)	5.00
Special fees	
Examination for removal of conditions	1.00
Special examination	5.00
Graduation fee	10.00
Large diploma fee	5.00

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.

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 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 Administration. 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; discharge of contracts. Williston, *Cases on Contracts* (Second ed.) Three hours. Mr. Hoshour.

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. Genuine principles underlying law of civil liability for wrongful conduct; specific wrongs of deceit, defamation, malicious prosecution, interference with contracts and trade, etc. Bohlen, *Cases on Torts.* 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. Casebook to be announced. Two hours. Mr. Maslon.

Agency. Principal and agent, master and servant—their rights and obligations, mutually and as to third persons. Mechem, *Cases on Agency* (Second 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. 1928-29, Cook, *Cases on Equity,* Vols. I and II; 1929-30, 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* (Second ed.). Two hours. Mr. Hoshour.

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. Britton, *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* (Second 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. Bonner, Mr. Bronson, Mr. Carroll, 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* (Second 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* (Second 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. Mr. Quigley.

(See announcement of Department of Political Science.)

Administration Law. Mr. Field.

(See announcement of Department of Political Science.)

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* (Third ed.). Two hours, half year. Mr. Hoshour.

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, half year. Mr. Fletcher.

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. Tooke's *Cases on Municipal Corporations*. Two hours, half year. Mr. Dwan.

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. Robinson, *Cases on Public Utilities*. Two hours, half year. Mr. Rottschaefer.

Taxation. This course deals only with the legal questions arising in connection with the assessment of property and the levying and collection of taxes. Rottschaefer, *Cases on Taxation*. Two hours, 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, half year. Mr. Dwan.

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, 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. Mr. Hoshour.

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; summer 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. McCurdy, *Cases on the Law of Persons and Domestic Relations*. Two hours, half year. Mr. Paige.

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, 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.[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.

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

[1] Must be legally eligible for enrolment in R.O.T.C. Consult P.M.S.&T.

No	Title	Hour	Day	Bldg.	Instructor
53s	First Year Adv. Course.....	VII, VIII, IX	T or W	A	Ar
		IV	TS	A	Ar
54f-55w	Second 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
56s	Second Year Adv. Course.....	VII, VIII, IX	T or W	A	Ar
		IV	TS	A	Ar

ATTENDANCE FOR 1927-28

Third year class.....	93
Second year class.....	81
First year class.....	117
Total	291

The Bulletin *of the* University *of* Minnesota

The Medical School

Announcement for the Years 1927-1929

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1927

JULY

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	..	..	..	..	..	..

AUGUST

Su	Mo	Tu	W	Th	Fr	Sa
..	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
..	..	..	..	..	..	..

SEPTEMBER

Su	Mo	Tu	W	Th	Fr	Sa
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	..
..	..	..	..	..	..	..

OCTOBER

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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.

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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 unclassed 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.

CORRECTION IN FEES

Quarterly resident tuition fee - $ 75
Quarterly non-resident tuition fee 100
Quarterly incidental fee - - 6
Credit hour fees increased proportionally
Other fees as printed

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.

CORRECTION IN FEES
Quarterly resident tuition fee - $ 75
Quarterly non-resident tuition fee 100
Quarterly incidental fee - - 6
Credit hour fees increased proportionally
Other fees as printed

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 interneship 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.

APPROXIMATE ARRANGEMENT OF JUNIOR AND SENIOR STUDIES—Figures indicate hours per week.

	Summer	Fall				Winter				Spring				Summer			Fall			Winter			Spring	
	A	A	B	C	D	A	B	C	D	A	B	C	D	A	B	D	A	B	C	B	C	D	C	D
Physiol. 105 (Roentgen Rays)		1	1	1	1																			
Pharm. 105-106 (Pharmacology and Therapeutics)	2	2	2	2	2		2	2	2															
Pharm. 108 (Prescription Writing)	1		1	1	1																			
P. M. and P. H. 100 (Hygiene)		3	3	3	3																			
P. M. and P. H. 101 (Field Work)																2	2			2			2	
Path. 109 (Clinical Pathological Conference)														1		1	1	1	1	1			1	1
Med. 22 (Dispensary Division Clinics)	2	2	2	2	2	2	2	2	2		2	2	2											
Med. 23, 24 (Principles and Practice of Medicine)	3	3	3	3	3		3	3	3															
Med. 25 (Physical Diagnosis and Case Taking)	6		6					6					6											
Med. 26 (Clinical Chemistry and Microscopy)	6										6	6	6											
Med. 29 (Junior Class Clinic)	1	1	1	1	1	1	1	1	1		1	1	1											
Med. 30 (Senior Class Clinic)										2				2	2	2	2	2	2	2	2	2	2	2
Med. 31, 32 (Mouth Infections and Med. Jurisprudence)										2	2	2	2											
Med. 40 (Neurology and Neurologic Diagnosis)						3	3	3	3															
Med. 41 (Psychiatry)																	2	2					2	2
Med. 42 (Section Clinics in Neurology and Psychiatry)	1			1					1		1													
Med. 46 (Dermatology and Syphilis)						3	3	3	3															
Surg. 21 (Principles of Surgery)	2		2	2	2																			
Surg. 22 (General Surgery)		2	2	2	2																			
Surg. 23-24 (Regional Surgery)						2	2	2	2	2	2	2	2											
Surg. 25 (Fractures and Dislocations)						2														2	2	2		
Surg. 26 (Diagnostic Clinic)		1	1	1	1	1	1	1	1															
Surg. 40 (Phalen. Orthopedic Surgery)		2			2		2					2												
Surg. 42 (Orthopedic Surgery)																	1	1					1	1
Surg. 46 (Genito-Urinary Diseases)						1½														1½	1½	1½		
Hosp. 79 (Roentgenology)														1	1						1	1		
Obst. 20, 21 (Obstetrics)	3	3	3	3	3		3	3	3															
Obst. 22 (Operative Obstetrics)														1	1								1	1
Obst. 23 (Gynecology)	1		1	1	1																			
Obst. 24 (Gynecology)						2	2	2	2															
Obst. 25 (Obstetrics and Gynecology)														2	2		2	2			2	2	2	2
Ped. 21, 22 (Diseases of Children)						2	2	2	2	3	3	3	3											
Ped. 24 (Clinics in Contagious Diseases)	1			1					1		1													
Ped. 29 (Pediatric Clinic)										1½					1½				1½			1½		
Ped. 120 (Child Guidance Clinic)																	1½	1½					1½	1½
Oph. and Otol. 20, 21, 22 (Ophthalmology, Otology, etc.)						2	2	2	2	2	2	2	2											
Med. 33 (Clinical Clerkship)														22				22			22			22
Surg. 28 (Clinical Clerkship)																18	18			18			18	
Obst. 26 { Clinical Clerkship }										12					12				12			12		
Ped. 27 { Clinical Clerkship }																								
Dispensary, average										18				8	18	12	12	8	18	12	8	18	12	8
Electives, average required	6	6	6	6	6	6	6	6	6		6	6	6											
Total, average	30	30				30				30				35			35			35			35	

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 interneship in a hospital approved by the Interneship 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 postnatal 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 alcohl, 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 Sanitorium. Sixth year. 275 hours. Dr. Berglund, Dr. Ulrich, and staff.

33xsu,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. Externeship 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.

27xf,w,s,su. Part of 27, at Minneapolis General Hospital. Dr. Huenekens, Dr. Moriarty, and others.

28f,w,s,su. Infant Welfare Clinic. Required of sections of one division of senior class each quarter. 6 hours. 19 Millard Hall. Dr. Lippman.

29f,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*

51f,w,s,su. Clinic in Pediatrics. Conducted at the Minneapolis General Hospital. Fifth year. 17 hours. Dr. Huenekens, Dr. Anderson, Dr. Lippman.

52f,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. Prerequisite: 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. Bjorndahl, Dr. O. Bjorndahl, 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 1. 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, vitamines, 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.

Bulletin *of the* University *of* Minnesota

The College of Dentistry

Announcement for the Year 1927-1928

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1927

JULY

Su	Mo	Tu	W	Th	Fr	Sa
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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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1928

JANUARY

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FEBRUARY

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MARCH

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MAY

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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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 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, 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

FACULTY

ADMINISTRATION

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, Professor of Prosthetic Dentistry and Orthodontia, and Chairman of the Department of Dentistry

ANATOMY

Clarence M. Jackson, M.S., M.D., LL.D., Professor of Anatomy
Thomas G. Lee, B.S., M.D., Professor of Comparative Anatomy
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

BACTERIOLOGY AND IMMUNOLOGY

Winford P. Larson, M.D., Professor of Bacteriology and Immunology and Director of the Department of Bacteriology and Immunology
Robert G. Green, M.A., M.D., Associate Professor of Bacteriology and Immunology
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

William F. Lasby, B.A., D.D.S., Acting Dean of the College of Dentistry, Professor of Prosthetic Dentistry and Orthodontia, and Chairman of the Department of Dentistry
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
Archibald B. Butter, D.D.S., Assistant Professor of Operative Dentistry
Oscar Cooperman, D.D.S., Associate Professor of Prosthetic Dentistry and Oral Anatomy
Norman J. Cox, B.S., D.M.D., Associate Professor of Operative Dentistry
George M. Damon, D.D.S., Professor of Prosthetic Dentistry and Oral Anatomy and Chairman of the Division of Oral Anatomy
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
Jay M. Freeburg, D.D.S., Assistant Professor of Operative Dentistry
Henry S. Godfrey, D.M.D., Professor of Operative Dentistry

Robert O. Green, D.D.S., Professor of Operative Dentistry
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 and Prosthetic Dentistry
Raymond R. Henry, D.D.S., Assistant Professor of Operative Dentistry
Clare E. Hermann, D.D.S., Assistant Professor of Oral Surgery
Roy M. Jernall, D.D.S., Assistant Professor of Prosthetic Dentistry
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
Harry C. Lawton, D.D.S., Associate Professor of Prosthetic Dentistry and Orthodontia
Joseph M. Little, D.D.S., Associate Professor of Operative Dentistry
Everett E. MacGibbon, D.D.S., Associate Professor of Oral Surgery
Herman A. Maves, D.D.S., Professor of Oral Surgery
Richard S. Maybury, D.D.S., Associate Professor of Operative Dentistry
George A. Montelius, D.D.S., Assistant Professor of Oral Diagnosis
Earl A. Nelson, D.D.S., Assistant Professor of Crown and Bridge Work
Earle W. Nelson, D.D.S., Assistant Professor of Oral Surgery
Herbert C. Nelson, D.D.S., Associate Professor of Crown and Bridge Work
Carl F. Otto, D.D.S., Associate Professor of Crown and Bridge Work
Alfred A. Pagenkopf, D.D.S., Professor of Crown and Bridge Work
Paul S. Parker, D.D.S., Assistant Professor of Operative Dentistry
Mark O. Pattridge, D.D.S., Associate Professor of Operative Dentistry
George W. Reynolds, D.D.S., Professor of Crown and Bridge Work
William A. Roll, D.D.S., Associate Professor of Crown and Bridge Work
Charles E. Rudolph, D.D.S., Professor of Prosthetic Dentistry, Oral Anatomy, and Orthodontia
Joseph F. Shellman, D.D.S., Professor of Operative Dentistry
Lewis W. Thom, D.D.S., Assistant Professor of Operative Dentistry
Edward T. Tinker, D.D.S., Professorial Lecturer of Crown and Bridge Work
William D. Vehe, D.D.S., Associate Professor of Crown and Bridge Work and Operative Dentistry
Harold F. Wahlquist, B.S., D.D.S., M.D., Assistant Professor of Oral Diagnosis and Oral Hygiene and Pathology
Carl W. Waldron, M.D., D.D.S., L.D.S., F.A.C.S., Professor of Oral Hygiene and Pathology and Oral Surgery and Chairman of the Division of Oral Hygiene and Pathology
James M. Walls, D.M.D., Professor of Operative Dentistry and Chairman of the Division of Operative Dentistry
Oscar A. Weiss, D.M.D., Professor of Prosthetic Dentistry and Orthodontia 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 Prosthetic Dentistry
F. Denton White, D.D.S., Professorial Lecturer of Oral Hygiene and Pathology
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 Radusch, 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. Wangensteen, 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 (unclassed 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
	14½ =	346½	17½ =	390½	14 =	341	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
	18 =	374	18 =	385	17 =	374	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
	17 =	429	17 =	429	17 =	429	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
	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
	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
	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 sophomores[1] 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 sophomores[1] 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.

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. Radusch.

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. Radusch.

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. Fahr, 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. Radusch.

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 sophomores[1] 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 sophomores[1] 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 juniors[1] and seniors.[2] Dr. Wangensteen, 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 Years
1928-1930

Vol. XXXI No. 35 June 7 1928

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Act of October 3, 1917, authorized July 12, 1918

1928

JULY

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AUGUST

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1929

JANUARY

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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UNIVERSITY CALENDAR
1928-29

Fall Quarter

1928			
September	20	Thursday	Payment of fees closes, except for new students
September	21-24		Entrance examinations (for removal of entrance deficiencies)
			Registration of all new students entering the freshman class
September	24-28		Examinations for removal of conditions
			Physical examinations
			Registration period,[1] Colleges of Science, Literature, and the Arts, and Education
September	24-29		Freshman week
September	27-28		Registration days[1] for all colleges not included above
September	28	Friday	Payment of fees for new students closes
October	1	Monday	Fall quarter classes begin, 8:30[2] a.m.
			Fall semester extension classes[3] begin
October	18	Thursday	Senate meeting, 4:30 p.m.
October	20	Saturday	Homecoming Day
November	6	Tuesday	Election Day; a holiday
November	12	Monday	A holiday; (November 11, Sunday, Armistice Day)
November	29	Thursday	Thanksgiving Day; a holiday
December	6	Thursday	State Day Convocation
December	19-22		Final examination period
December	20	Thursday	Commencement Convocation
			Senate meeting, 4:30 p.m.
December	22	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	26	Wednesday	Payment of fees closes for all students in residence fall quarter[4]

Winter Quarter

1929			
January	2-4		Entrance examinations
January	4-5		Registration days for new students in College of Science, Literature, and Arts

[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 44.

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	5	Saturday	Registration day for new students in all other colleges, 8:30 a.m.-3:00 p.m.
January	7	Monday	Christmas vacation ends, winter quarter classes begin, 8:30[2] a.m.
February	2	Saturday	First semester extension classes close
February	4	Monday	Second semester extension classes begin
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	20-23		Final examination period
March	22	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter[1]
March	23	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

Spring Quarter

March	25-27		Entrance examinations
March	29	Friday	Good Friday; a holiday
March	30	Saturday	Registration day for new students in all colleges, 8:30 a.m.-3:00 p.m.
April	1	Monday	Spring vacation ends, spring quarter classes begin, 8:30[2] a.m.
May	16	Thursday	Cap and Gown Day Convocation Senate meeting, 4:30 p.m.
May	30	Wednesday	Memorial Day; a holiday
June	1	Saturday	Second semester extension classes close
June	12-15		Final examination period
June	15	Saturday	Spring quarter closes, 5:20 p.m.
June	16	Sunday	Baccalaureate service
June	17	Monday	Fifty-seventh annual commencement

Summer Quarter

June	18-19		Registration, first term
June	20	Thursday	Classes begin, 8:00 a.m.
July	4	Thursday	Independence Day; a holiday
July	27	Saturday	Registration and payment of fees for second term closes
July	29	Monday	Second term classes begin
August	31	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 44.

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.

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.S., 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 Department 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 and Prosthesis

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 arrangement of the course is worked out in co-operation with the head.

Frank M. Rarig, M.A., Professor of Public Speaking
William A. Riley, Ph.D., Professor of Entomology and Economic Zoology and Head of the Department of Zoology
Adolph R. Ringoen, Ph.D., Assistant Professor of Zoology
Russell A. Stevenson, Ph.D., Dean of the School of Business Administration
Joseph M. Thomas, Ph.D., Professor of English and Chairman of the Department of English
Harold F. Wahlquist, B.S., D.D.S., M.D., 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
Charles Peterka, D.D.S., Instructor in Prosthetic Dentistry
Dorothy Radusch, D.D.S., Instructor in Oral Hygiene and Pathology
Charles E. Skinner, Ph.D., Instructor in Bacteriology
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 1928-29 will begin October 1, 1928. Registration days are September 27 and 28. 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, 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 and applicant must present the minimum requirements of a major and two minors. (See the general information bulletin for a complete statement of admission requirements.)

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.

FEES

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	6.00
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 $7.

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 in the Home."

COURSE OF STUDY—YEARS 1928-30

FIRST YEAR

Course Number	Subject	Department	Fall Quarter Hours	Fall Quarter Credits	Winter Quarter Hours	Winter Quarter Credits	Spring Quarter Hours	Spring Quarter Credits	Total Hours	Total Credits	Prerequisites	Instructor
4f-5w-6s	Freshman Composition	English	33	3	33	3	33	3	99	9	None	Ar. by Mr. Thomas
5f-6w	General Zoology	Zoology	77	4	77	4			154	8	None	Mr. Ringoen
11,s	Elementary Physiology and Physiologic Chemistry	Physiology	99	7					99	7	None	Dr. Greisheimer
1f-2w-3s	Elem. Phys. Training	Physical Ed.	33	0	33	0	33	0	99	0	None	Ar. by Dr. Norris
4f	Preliminary Hygiene	Physical Ed.	11	0					11	0	None	Dr. Norris
8w-9s	Oral Anatomy	Dentistry	22	1	44	2	44	2	110	5	None	Dr. Harker
21w-22s	Dental Prophylaxis	Dentistry			66	2	33	1	99	3	None	Miss Ueland
41w-42s	Public Speaking	Speech			33	3	33	3	66	6	Comp. 4	Ar. by Mr. Rarig
3s	Elementary Anatomy	Anatomy					44	3	44	3	None	Dr. Fisher
1s	Elementary Bacteriology	Bacteriology					66	4	66	4	None	Dr. Skinner
		Total	275	15	286	14	286	14	847	45		

SECOND YEAR

Course Number	Subject	Department	Fall Quarter Hours	Fall Quarter Credits	Winter Quarter Hours	Winter Quarter Credits	Spring Quarter Hours	Spring Quarter Credits	Total Hours	Total Credits	Prerequisites	Instructor
23f-24w-25s	Dental Prophylaxis	Dentistry	66	2	66	2	66	2	198	6	Proph. 21-22	Miss Ueland
1f-2w	General Psychology	Psychology	33	3	33	3			66	6	None	Ar. by Mr. Elliott
10f-11w	Ed. School Work	Dentistry	44	2	44	2			88	4	None	Dr. White
31f	Oral Hygiene	Dentistry	22	2					22	2	Physiol. 1 & Bact. 1	Dr. Wahlquist
39f	General Pathology	Dentistry	11	1					11	1	Gen. Path., Physiol. & Bact.	Dr. Wahlquist
6f	Prosthetic Dentistry	Dentistry	44	2					44	2	None	Dr. Harker
44f	Foods, Nutrition, & Health	Dentistry	11	1					11	1	None	Miss Ueland
45f	Principles of and Clinical Dentistry	Dentistry	55	2					55	2	None	Ar. by Miss Ueland
40w	Oral Pathology	Dentistry			22	2			22	2	Zoology, Physiol. and Bact.	Dr. Radusch
29w	Dental Laboratory	Dentistry			33	1			33	1	Oral Anat. 8-9	Dr. Peterka
1s	Introduction to Sociology	Sociology					55	5	55	5	None	Ar. by Mr. Chapin
43s	Thesis and Seminar	Dentistry					22	2	22	2	None	Ar. by Dr. Lasby
52s	Health Care of the Family	Prev. Medicine					55	3	55	3	Physiol. 1 & Bact. 1	Miss Fisher
95Nw	Office Practice	Business			11	1			11	1	None	Ar. by Mr. Stevenson
	Electives					4		3		7		
		Total	286	15	209	15	198	15	693	45		

DESCRIPTION OF COURSES

ANATOMY

3s. 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. Dr. Skinner.

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. Arranged by Mr. Stevenson.

DENTISTRY

ORAL ANATOMY

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. Seven hours a week for the first quarter and four hours a week for the second quarter. 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. Three hours a week for one quarter. Dr. Peterka.

ORAL HYGIENE AND PATHOLOGY

39f. General Pathology. A lecture course on the general pathological conditions. One hour a week for one quarter. Dr. Wahlquist.

40w. Oral Pathology. A course on special pathology of teeth and oral tissues, including systemic manifestations of oral diseases. Two hours a week for one quarter. Dr. Radusch.

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, followed by practice on actual patients

in the dental infirmary. Six hours a week in the winter quarter and three hours a week in the spring quarter. Miss Ueland.

23f-24w-25s. Dental Prophylaxis. A continuation of Prophylaxis 21-22. The teaching of oral hygiene is emphasized. Six hours a week for three quarters. Miss Ueland.

10f-11w. Educational School Work. A recitation course in the preparation and delivery of talks on oral hygiene for various groups and occasions followed by demonstrations and practical work in teaching oral hygiene in the public schools. Four hours a week for two quarters. Dr. White.

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.

44f. 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.

PROSTHETICS

6f. 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 one quarter—one lecture hour and three laboratory hours per week. Dr. Harker.

THESIS AND SEMINAR, MISCELLANEOUS LECTURES, ETC.

43s. A thesis, seminar, and lecture course in the theory and practice of medicine and dentistry, applied economics, jurisprudence, psychology, and ethics. Two hours a week for one quarter. Arranged by Dr. Lasby.

45f. Principles of and Clinical Dentistry. Lectures, demonstrations, and practical experience in surgical assisting, dental assisting, dental roentgenology, general anesthesia, operative dentistry, crown and bridge work, dental prosthesis, and orthodontia. Six hours a week for one quarter. Arranged by Miss Ueland.

ENGLISH

4f-5w-6s. Freshman Composition. The study of the fundamental principles of composition and training in the art of writing. Three hours a week for three quarters. Arranged by Mr. Thomas.

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.

SPEECH

41w-42s. 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 two quarters. Arranged by Mr. Rarig and staff.

ZOOLOGY

5f-6w. General Zoology. This course is designed to acquaint the student with the fundamental principles of general zoology. It deals especially with the structure, physiology, embryology, classification, and evolution of animals. Textbook, lectures, quizzes, and laboratory. Seven hours a week for two quarters. Mr. Ringoen.

The Bulletin *of the* University *of* Minnesota

The School of Mines and Metallurgy Announcement for the Years 1928-1930

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1928

JULY

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1929

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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UNIVERSITY CALENDAR

1928-29

Fall Quarter

1928			
September	20	Thursday	Payment of fees closes, except for new students
September	21-24		Entrance examinations (for removal of entrance deficiencies)
			Registration of all new students entering the freshman class
September	24	Monday	Seniors, School of Mines and Metallurgy report for completion of field work
September	24-28		Examinations for removal of conditions
			Physical examinations
			Registration period,[1] Colleges of Science, Literature, and the Arts, and Education
September	24-29		Freshman Week
September	26	Wednesday	Juniors, School of Mines and Metallurgy report for completion of field work
September	27-28		Registration days[1] for all colleges not included above
September	28	Friday	Payment of fees for new students closes
October	1	Monday	Fall quarter classes begin, 8:30[2] a.m.
			First semester extension classes[3] begin
October	18	Thursday	Senate meeting, 4:30 p.m.
October	20	Saturday	Homecoming Day
November	6	Tuesday	Election Day; a holiday
November	12	Monday	A holiday; (November 11, Sunday, Armistice Day)
November	29	Thursday	Thanksgiving Day; a holiday
December	6	Thursday	State Day Convocation
December	19-22		Final examination period
December	20	Thursday	Commencement Convocation
			Senate meeting, 4:30 p.m.
December	22	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	26	Wednesday	Payment of fees closes for all students in residence fall quarter[4]

[1] Registration subsequent to the date specified will necessitate the approval of the college concerned. 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 8:15 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.

1929			*Winter Quarter*
January	2-4		Entrance examinations
January	4-5		Registration days for new students in College of Science, Literature, and Arts
January	5	Saturday	Registration day for new students in all other colleges, 8:30 a.m.-3:00 p.m.
January	7	Monday	Christmas vacation ends, winter quarter classes begin, 8:30[1] a.m.
February	2	Saturday	First semester extension classes close
February	4	Monday	Second semester extension classes begin
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	20-23		Final examination period
March	21	Thursday	Commencement Convocation Payment of fees closes for all students in residence winter quarter[2]
March	23	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.
			Spring Quarter
March	25-27		Entrance examinations
March	29	Friday	Good Friday; a holiday
March	30	Saturday	Registration day for new students in all colleges, 8:30 a.m.-3:00 p.m.
April	1	Monday	Spring vacation ends, spring quarter classes begin, 8:30[1] a.m.
May	16	Thursday	Cap and Gown Day Convocation Senate meeting, 4:30 p.m.
May	30	Thursday	Memorial Day; a holiday
June	1	Saturday	Second semester extension classes close
June	12-15		Final examination period
June	15	Saturday	Spring quarter closes, 5:20 p.m.
June	16	Sunday	Baccalaureate service
June	17	Monday	Fifty-seventh annual commencement
			Summer Quarter
June	18-19		Registration, first term
June	20	Thursday	Classes begin, 8:00 a.m.
July	4	Thursday	Independence Day; a holiday
July	27	Saturday	Registration and payment of fees for second term closes. First term closes
July	29	Monday	Second term classes begin
August	31	Saturday	Second term closes

[1] First hour classes begin at 8:15 at University Farm.

[2] Registration subsequent to the date specified will necessitate the approval of the college concerned. 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.

FACULTY

CHEMISTRY

Professor M. Cannon Sneed, Ph.D.; Associate Professor I. William Geiger, Ph.D.; Assistant Professor Norville C. Pervier, Ph.D.; Instructor Gladstone B. Heisig, M.S., M.A.

DRAWING AND DESCRIPTIVE GEOMETRY

Professor William H. Kirchner, B.S.; Assistant Professors Leon Archibald, B.Sc., Henry C. T. Eggers, E.E., Alex S. Levens, M.S. (C.E.), Howard D. Myers, B.S. in C.E..

ELECTRICAL ENGINEERING

Professor 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.; Assistant Professor Charles Boehnlein, B.S., M.E.

Mechanical Engineering

Professors Frank B. Rowley, B.S., M.E., Charles F. Shoop, B.S.; Instructor Jarl E. Larson, B.S.

GEOLOGY AND MINERALOGY

Professors William H. Emmons, Ph.D., Frank F. Grout, Ph.D., Clinton R. Stauffer, Ph.D.; Assistant Professors Ira S. Allison, Ph.D., John W. Gruner, Ph.D., George M. Schwartz, Ph.D., George A. Thiel, Ph.D.; Instructor George McL. Brownell, M.Sc.

GERMAN

Professor Carl Schlenker, B.A.; Assistant Professors James Davies, Ph.D., George Lussky, Ph.D.

METALLURGY

Professors William R. Appleby, M.A., Peter Christianson, B.S., E.M., Oscar E. Harder, Ph.D., Levi B. Pease, M.S.; Assistant Professor Ralph L. Dowdell, Met.E., Ph.D.; Instructors R. W. Allard, Met.E., Arthur C. Forsyth, Met.E., Henry S. Jerabek, B.S.

MILITARY SCIENCE AND TACTICS

Professor Bernard Lentz, Major, Infantry; Assistant Professors Ray C. Hill, Major, Infantry, Frederick S. Matthews, Captain, Infantry, Don F. Pratt, Captain, Infantry, Porter P. Wiggins, Captain, Infantry, Julian H. Gist, Captain, Infantry; Murray T. Davenport, Captain, Infantry; William G. Walker, Captain, Infantry; Instructors Alfred Brandt, Master Sergeant, Infantry; John Coop, Sergeant, Infantry.

MINE PLANT AND MECHANICS

Professor Elting H. Comstock, M.S.; Assistant Professors Louis S. Heilig, E.M., James C. Sanderson, Ph.D.

MINING

Professor Walter H. Parker, 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.; Ruth S. Phelps, Ph.D.; Colbert Searles, Ph.D.; Associate Professors Francis B. Barton, Docteur de l'Université de Paris; Edward H. Sirich, Ph.D.

GENERAL INFORMATION

The School of Mines and Metallurgy 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 and Metallurgy have, therefore, all the advantages afforded by a large university combined with ample opportunity for field observation and experience.

The School of Mines and Metallurgy 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 and Metallurgy there are four regular courses of study, viz., Mining Engineering, Mining Engineering specializing in Geology, Mining Engineering specializing in Petroleum, and Metallurgy, leading to the degree of engineer of mines (E.M.), engineer of mines in geology (E. M. [Geology]), engineer of mines in petroleum (E.M. [Petroleum]), and metallurgical engineer (Met.E.) respectively.

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 and Metallurgy 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. Co-operation 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 and Metallurgy 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 and Metallurgy, charges prepaid. Shipping tags will be furnished upon request.

Address all communications to William R. Appleby, Director, Minnesota School of Mines and Metallurgy Experiment Station, the University of Minnesota, Minneapolis, Minnesota.

ADMISSION

The courses leading to the degrees of engineer of mines, engineer of mines (in geology), engineer of mines (in petroleum), 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.

UNCLASSED STUDENTS

No unclassed students will be admitted to the School of Mines and Metallurgy.

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 and Metallurgy.

FEES

Tuition fee (per quarter)	
Residents of Minnesota	$30.00
Non-residents	40.00
Incidental fee (per quarter)	6.40
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); the investigation of an oil field problem, for candidates for the degree of engineer of mines (in petroleum); and the investigation of a metallurgical or metallographic problem, for candidates for the degree of metallurgical engineer.

As much latitude as possible will be allowed the student in the choice of his problem. He must select a suitable problem 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 opportunity therefor.

Prior to October 25 each student is required to submit to the department concerned an outline embodying the principal features of the problem. Unless this outline is submitted when due and is accepted by the department, registration for the first semester, senior year, may be cancelled.

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 15 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.

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.

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	Eng. Drawing	..	10	.....
Geology	1f	General Geology	3	1	.....
a. Mathematics	2f	Algebra	6	..	.....
b. Mathematics	1f	Alg. and Solid Geom.	6	..	.....
Military Science	1	Basic Course, R.O.T.C.	3	..	.....

Second Quarter

Chemistry	15w	General Inorganic	3	6	Chem. 14f
Drawing	12w	Eng. Drawing	..	4	Draw. 11f
Geology	23w	Elements of Mineralogy	3	4	Geol. 1f
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
Military Science	1	Basic Course, R.O.T.C.	3	..	.....

Third Quarter

Chemistry	16s	Qualitative Analysis	3	6	Chem. 15w
Drawing	13s	Eng. Drawing	..	8	Draw. 12w
Geology	24s	Elements of Mineralogy	3	4	Geol. 23w
Mathematics	5s	Analytical Geometry	6	..	Math. 4w
b. Mathematics	3s	Algebra	4	..	Math. 1f
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.

SOPHOMORE YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Drawing	14f	Descriptive Geometry	3	..	Draw. 13s, Math. 5s
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	15w	Drafting	..	4	With Draw. 14w
Geology	2w	Historical	3	8	Geol. 1f
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. Eng. 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	84s	Field Methods	..	4	Geol. 2w, 105f
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. Eng. 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	85	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. Eng., M.E.	35f	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. Eng., 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 Eng.	105w	Mine Mapping	..	6	Min. Eng. 4s

Third Quarter

Mechanics	111s	Mechanics	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 and Mine Rescue	1 week		.....
Mining	134s	Mining Methods	5	..	Min. 132w
Mining Eng.	107s	Mine Mapping	..	6	Min. Eng. 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 Eng.	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
Mecnanics	118f	Eng. 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. Eng., M.E.	147w	Advanced Lab.	..	4	Exp. Eng. 35f
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 Administration	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	143s	Mine Administration	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 on Monday of Freshman Week for a period of three weeks. 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.

At the close of the field work 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 by this time. 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; solving three-point problem by use of a plane table; 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	..	.....

Second Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Geology	124w	Struct. & Metamorphic	3	..	Geol. 73f, 105f
Geology	132w	Advanced Petrology	3	3	Geol. 2s, 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 Eng.	105w	Mine Mapping	..	6	Min. Eng. 4s
Elective	....	.....	3	..	.....

Third Quarter

Geology	125s	Struct. & Metamorphic	6	..	Geol. 73f, 105f
Geology	133s	Advanced Petrology	3	3	Geol. 2s, 106w
Geology	145s	Geologic Maps	..	12	Geol. 73f
Geology	153s	Advanced General	3	..	Geol. 73f
Mechanics	111s	Mechanics	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. 2s
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. 2s
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. 2s
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 on Wednesday of Freshman Week. 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 the Monday following.

Courses Leading to the Degree of Engineer of Mines in Petroleum

JUNIOR YEAR

First Quarter

Dept.	No.	Title	Lect.	Lab.	Prereq.
Exp. Eng.	35f	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. Eng.	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. Eng.	105w	Mine Mapping	..	3	M.E. 4s
Pet. Eng.	132w	Oil Field Development	5	..	Pet. Eng. 131f

Third Quarter

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	5	..	Mech. 110w
Mechanics	114s	Mine Plant	6	..	Mech. 113w
Pet. Eng.	151s	Petroleum Refining	5	..	.....
Pet. Eng.	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. Eng.	141f	Administration	5	..	Min. 134s
Pet. Eng.	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. Eng.	142w	Production Technology	5	..	Pet. Eng. 141f
Pet. Eng.	145w	Thesis	..	6	Pet. Eng. 144f

Third Quarter

Geology	93s	Paleontology	3	..	Geol. 2s
Geology	103s	Micropaleontology	..	6	Geol. 102w
Geology	145s	Geologic Maps	..	12	Geol. 73f
Pet. Eng.	143s	Production Technology	5	..	Pet. Eng. 142w
Pet. Eng.	146s	Thesis	..	12	Pet. Eng. 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 on Monday of Freshman Week for a period of three weeks. 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.

At the close of the field work 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 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 by this time. 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.

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 Eng.	106w	Mine Mapping	..	3	Min. Eng. 4s

Third Quarter

Mechanics	111s	Mechanics	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 and Mine Rescue, 1 week	..	..	.....
Mining Eng.	107s	Mine Mapping	..	3	Min. Eng. 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 Eng.	41f	Electric Power	2	3	Phys. 43s or Mech. 53s
Mechanics	117f	Water Power	5	2	Mech. 111s
Metallurgy	119f	Ore Testing	2	..	Met. 108s
Metallurgy	120f	Ore Testing Lab.	..	8	Met. 108s
Metallurgy	124f	Thesis	..	8	.....
*Electives	....	.....	6	..	.....

Second Quarter

Metallurgy	117w	Advanced Metallurgy	4	6	Met. 108s
Metallurgy	121w	Special Problems	..	4	Met. 119f
Metallurgy	125w	Thesis	..	18	Met. 124f
*Electives	....	.....	6	..	.....

Third Quarter

Metallurgy	118s	Advanced Metallurgy	4	6	Met. 117w
Metallurgy	122s	Special Problems	..	8	Met. 121w
Metallurgy	126s	Thesis	..	18	Met. 125w
*Electives	....	.....	6	..	.....

* It is recommended that electives be taken from the following courses: Met. 123f, Electrometallurgy; Met. 130f, 131w, 132s, Special Problems; Met. 163f, 164w, 165s, Advanced Metallography; Mech. 118f, 119w, 121s, Engineering Construction.

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 course 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 and Metallurgy Experiment Station laboratory are available for working out practical problems. The Mines and Metallurgy 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 maganiferous 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 and Metallurgy 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 on Monday of Freshman Week for a period of three weeks. 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.

At the close of the field work 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 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 by this time. 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.

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.

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

9. 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.
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.

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

35. 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.

147. 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. Elements of Mineralogy. 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.

84. Field Methods. General methods of field work necessary for Course 85.

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 1928, 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.

9. Introductory Metallurgy. General principles of furnace practice.

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.
130-131-132. Special Problems in Metallurgy. Seminar work on metallurgical problems. Credits and hours to be arranged.
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, micro-

scopic 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.

204-205-206. Special Problems in Advanced Metallurgy. Intended primarily for research work. Credits and hours to be arranged.

210-211-212. Thesis courses for graduate students. Intended primarily for research work. Credits and hours to be arranged.

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, mechanical 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 ore bins, headframes, etc.

119. Engineering Construction. Design of structures for mining and metallurgical plant.

120. Mine Plant Design. A study of power possibilities, costs, etc., and design of a power plant, surface equipment, and structures for a mine.

121. Metallurgical Plant Design. A study of power possibilities, costs, etc., and design of a power plant, and structures for a metallurgical plant.

MINING

21. Introductory Mining. Introductory mining course, preparatory to sophomore field trip.

130. First Aid and Mine Rescue. Course in first aid to the injured and mine rescue given by the staff of the United States Bureau of Mines car.

131. Exploration. Location of mineral lands, prospecting, exploration, boring, 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 for metallurgists.

141. Mine Administration. Mine examination and mining reports. Amortization. Mining corporations, capitalization, stocks and bonds. Contracts and specifications. Placer, hydraulic mining, and dredging.

142. Mine Administration. Coal mining and coal preparation. Mine gases. Accident prevention. State mining codes. Mining law and court interpretations. Compensation laws.

143. Mine Administration. Continuation of Course 142.

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, plane table surveying, 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.

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1927

JULY

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1928

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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 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, 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 unclassed 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

First Quarter	*Second Quarter*	*Third Quarter*
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.

Second Year—Combined

First Quarter	*Second Quarter*	*Third Quarter*
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

First Quarter	*Second Quarter*	*Third Quarter*
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:

First Quarter	*Second Quarter*	*Third Quarter*
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

First Quarter	*Second Quarter*	*Third Quarter*
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. Smyithe, 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. Smyithe, 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 Rugnar 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. (¾ 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. (6½ 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. (4½ 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. (4½ 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. (7½ 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. (4½ 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, glucocides, 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; nonmetallic 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, Phm.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 1928-1930

Vol. XXXI No. 48 August 2 1928

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Part I of this bulletin is published every two years. Additions and changes for the second year of the biennium will be published in Part II which is issued annually.

THE SCHOOL OF CHEMISTRY

FACULTY AND STAFF

ADMINISTRATION

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Ora Miner Leland, B.S., C.E., Dean of the School of Chemistry and the College of Engineering and Architecture
Samuel Colville Lind, Ph.D., Professor of Chemistry and Director of the School of Chemistry

INORGANIC CHEMISTRY

M. Cannon Sneed, Ph.D., Professor of Inorganic Chemistry and Chief of the Division
Hervey H. Barber, Ph.D., Assistant Professor of Inorganic Chemistry and Superintendent of Supply and Equipment
Lillian Cohen, Ph.D., Associate Professor of Inorganic Chemistry
Raymond E. Kirk, Ph.D., Associate Professor of Inorganic Chemistry
Norville C. Pervier, Ph.D., Assistant Professor of Inorganic Chemistry
Lloyd H. Reyerson, Ph.D., Associate Professor of Inorganic Chemistry
Henry N. Stephens, Ph.D., Assistant Professor of Inorganic Chemistry
Gladstone B. Heisig, M.S., M.A., Instructor in Inorganic Chemistry
J. Lewis Maynard, B.A., Instructor in Inorganic Chemistry
Richard Black, B.A., Assistant in Inorganic Chemistry
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Angus E. Cameron, B.A., Assistant in Inorganic Chemistry
Albert L. Chaney, M.S., Assistant in Inorganic Chemistry
L. Wallace Cornell, B.S., Assistant in Inorganic Chemistry
Alice D. Duschak, M.A., Assistant in Inorganic Chemistry
Hertha R. Freche, B.A., Assistant in Inorganic Chemistry
Keren E. Gilmore, M.A., Assistant in Inorganic Chemistry
Donovan E. Kvalnes, B.A., Assistant in Inorganic Chemistry
Maurice G. Larian, M.S., Assistant in Inorganic Chemistry
Byron E. Lauer, B.S., Assistant in Inorganic Chemistry
Barnard M. Marks, B.S., Ch.E., Assistant in Organic Chemistry
Earl F. Ogg, M.A., Assistant in Inorganic Chemistry
Charles Rosenblum, B.S., Assistant in Inorganic Chemistry
Florence N. Schott, M.S., Assistant in Inorganic Chemistry
Grant W. Smith, B.A., Assistant in Inorganic Chemistry
Editha Underhill, M.S., Assistant in Inorganic Chemistry
Edward M. Van Duzee, B.Ch.E., Assistant in Inorganic Chemistry

ANALYTICAL CHEMISTRY

Isaak M. Kolthoff, Ph.D., Professor of Analytical Chemistry and Chief of the Division
Charles F. Sidener, B.S., Professor of Analytical Chemistry, Emeritus

I. William Geiger, Ph.D., Associate Professor of Analytical Chemistry
Landon A. Sarver, Ph.D., Assistant Professor of Analytical Chemistry
Tohru Kameda, B.S., Assistant in Analytical Chemistry
Ernest B. Sandell, B.S., Assistant in Analytical Chemistry

ORGANIC CHEMISTRY

William H. Hunter, Ph.D., Professor of Organic Chemistry and Chief of the Division
George B. Frankforter, Ph.D., Professor of Industrial Organic Chemistry, Emeritus
Walter M. Lauer, Ph.D., Assistant Professor of Organic Chemistry
Lee I. Smith, Ph.D., Associate Professor of Organic Chemistry
Gordon D. Byrkit, M.S., Assistant in Organic Chemistry
Walter N. Day, B.S., Assistant in Organic Chemistry
William F. Filbert, B.S., Assistant in Organic Chemistry
Elmore H. Northey, B.A., Assistant in Organic Chemistry
Robert V. Yohe, B.A., Assistant in Organic Chemistry

PHYSICAL CHEMISTRY

Frank H. MacDougall, Ph.D., Professor of Physical Chemistry
Robert S. Livingston, Ph.D., Assistant Professor of Physical Chemistry
Nelson W. Taylor, Ph.D., Assistant Professor of Physical Chemistry
Chester R. Brothers, M.A., Assistant in Physical Chemistry
Frank H. Stodola, B.S., Assistant in Physical Chemistry
Edward C. Truesdale, M.A., Assistant in Physical Chemistry

TECHNOLOGICAL CHEMISTRY

Everhart P. Harding, Ph.D., Associate Professor of Technological Chemistry
Arthur E. Stoppel, Ph.D., Assistant Professor of Technological Chemistry
Ralph E. Brewer, Ph.D., Instructor in Technological Chemistry

CHEMICAL ENGINEERING

Charles A. Mann, Ph.D., Professor of Chemical Engineering and Chief of the Division
George H. Montillon, Ph.D., Associate Professor of Chemical Engineering
Ralph E. Montonna, Ph.D., Assistant Professor of Chemical Engineering
Burrell F. Ruth, M.S., Instructor in Chemical Engineering

Harold A. Bunger, B.S., Shevlin Fellow
Kenneth A. Kobe, M.S., duPont Fellow

DRAWING AND DESCRIPTIVE GEOMETRY

William H. Kirchner, B.S., Professor of Drawing and Descriptive Geometry and Head of the Department
Leon Archibald, B.Sc., Assistant Professor of Drawing and Descriptive Geometry
Robert W. French, B.S.(C.E.), Associate Professor of Drawing and Descriptive Geometry

Alex S. Levens, M.S.(C.E.), Assistant Professor of Drawing and Descriptive Geometry
Robert F. Schuck, B.S.(E.E.), Assistant Professor of Drawing and Descriptive Geometry
William S. Williams, B.S.(E.E.), Assistant Professor of Drawing and Descriptive Geometry

ECONOMICS

Alvin H. Hansen, Ph.D., Professor of Economics
Ernest A. Heilman, Ph.D., Associate Professor of Accounting
Bruce H. Mudgett, Ph.D., Professor of Economics
Harry J. Ostlund, B.A., Assistant Professor of Accounting
John J. Reighard, M.A., C.P.A., Assistant Professor of Accounting
William H. Stead, Assistant Professor of Economics
J. Warren Stehman, Ph.D., Associate Professor of Economics
Roland S. Vaile, M.A., Professor of Economics
Jeremiah S. Young, Ph.D., Professor of Political Science
Wayne E. Butterbaugh, M.S., Lecturer in Economics
Jay L. O'Hara, Ph.D., Lecturer in Economics

ELECTRICAL ENGINEERING

John M. Bryant, E.E., M.S., Professor of Electrical Engineering and Head of the Department
William T. Ryan, E.E., Professor of Electrical Engineering
Franklin W. Springer, E.E., Professor of Electrical Engineering
Elmer W. Johnson, E.E., M.E., Assistant Professor of Electric Power Engineering

ENGLISH

Cecil A. Moore, Ph.D., Professor of English and Chairman of the Department of English
John J. Creamer, B.A., LL.B., Instructor in English

GEOLOGY AND MINERALOGY

William H. Emmons, Ph.D., Professor of Geology and Mineralogy and Head of the Department
John W. Gruner, Ph.D., Assistant Professor of Geology

GERMAN

Carl Schlenker, B.A., Professor of German and Head of the Department
James Davies, Ph.D., Assistant Professor of German
George F. Lussky, Ph.D., Assistant Professor of German
Karl Ermisch, M.A., Instructor in German
Gina O. Wangsness, B.A., Instructor in German
Bertha M. Bertsch, Teaching Assistant in German

MATHEMATICS AND MECHANICS

William E. Brooke, B.C.E., M.A., Professor of Mathematics and Mechanics and Head of the Department
Hans H. Dalaker, Ph.D., Professor of Mathematics and Mechanics

Carl A. Herrick, M.E., Associate Professor of Mathematics and Mechanics
Raymond R. Herrmann, E.E., Assistant Professor of Mathematics and Mechanics
Jacob O. Jones, M.C.E., Professor of Hydraulics
William M. McClintock, M.A., Assistant Professor of Mathematics and Mechanics
George C. Priester, B.S.(Min.E.), Ph.D., Associate Professor of Mathematics and Mechanics
Roderick W. Siler, B.S., Assistant Professor of Mathematics and Mechanics
Hugh B. Wilcox, B.S.(E.E.), M.S., Associate Professor of Mathematics and Mechanics
Leo Branovan, B.S. (E.E.), M.S., Instructor in Mathematics and Mechanics
Harry A. Doeringsfeld, C.E., Instructor in Mathematics and Mechanics
Forrest E. Miller, B.S. (Ag.E.), Instructor in Mathematics and Mechanics
Edward A. Saibel, Ph.D., Instructor in Mathematics and Mechanics
Eli J. Sax, B.S. (E.E.), Instructor in Mathematics and Mechanics

MECHANICAL ENGINEERING

John R. DuPriest, B.S.(E.E.), M.E., M.M.E., Professor of Mechanical Engineering and Head of the Department
S. Carl Shipley, B.S., M.E., Professor of Machine Construction and Superintendent of Shops
John Flodin, M.E., M.A., M.S., Assistant Professor of Machine Design
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

METALLOGRAPHY

Oscar E. Harder, Ph.D., Professor of Metallography
Ralph L. Dowdell, Ph.D., Assistant Professor of Metallography

METALLURGY

William R. Appleby, M.A., Professor of Metallurgy and Dean of the School of Mines and Metallurgy
Peter Christianson, B.S., E.M., Professor of Metallurgy
Levi B. Pease, M.S., Professor of Metallurgy

MILITARY SCIENCE AND TACTICS

Bernard Lentz, Major, Infantry, Professor of Military Science and Tactics and Head of the Department
Willis Shippam, Major, Coast Artillery Corps, Assistant Professor of Military Science and Tactics and Head of the Coast Artillery Corps Unit
Wilton B. Persons, Captain, Signal Corps, Assistant Professor of Military Science and Tactics and Head of the Signal Corps Unit
Nyal L. Adams, Captain, Coast Artillery Corps, Assistant Professor of Military Science and Tactics
John F. Cassidy, First Lieutenant, Coast Artillery Corps, Assistant Professor of Military Science and Tactics

Harry E. Strider, Master Sergeant, Signal Corps, Instructor in Military Science and Tactics

Aubrey R. Dunkum, Staff Sergeant, Coast Artillery Corps, Instructor in Military Science and Tactics

Ernest R. Mylk, Sergeant, Coast Artillery Corps, Instructor in Military Science and Tactics

PHYSICAL EDUCATION FOR MEN

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.B., Instructor in Physical Education for Men

David MacMillan, B.S., 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, M.A., Assistant Professor of Physical Education for Women

May S. Kissock, M.A., Assistant Professor of Physical Education for Women

Alice J. H. Tolg, M.D., Assistant Professor of Physical Education for Women

Agnes S. Anderson, Instructor in Physical Education for Women

Else H. Bockstruck, B.S., Instructor in Physical Education for Women

Mary S. Conger, Instructor in Physical Education for Women

Grace Denny, B.A., Instructor in Physical Education for Women

Winona E. Jones, B.S., Instructor in Physical Education for Women

Pauline Lane, B.A., Instructor in Physical Education for Women

Florence Warnock, B.S., Instructor in Physical Education for Women

PHYSICS

Henry A. Erikson, B.E.E., Ph.D., Professor of Physics and Chairman of the Department

J. William Buchta, Ph.D., Assistant Professor of Physics

Louallen F. Miller, Ph.D., Associate Professor of Physics

John T. Tate, Ph.D., Professor of Physics

[1]Joseph Valasek, Ph.D., Associate Professor of Physics

Anthony Zeleny, Ph.D., Professor of Physics

PHYSIOLOGIC CHEMISTRY

Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry

Chauncey J. V. Pettibone, Ph.D., Associate Professor of Physiologic Chemistry

[1] On sabbatical furlough, 1928-29.

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

James A. Childs, C.E., Assistant Professor of Preventive Medicine and Public Health

Harry De Witt Lees, M.D., Assistant Professor of Preventive Medicine and Public Health

William A. O'Brien, M.D., Assistant Professor of Preventive Medicine and Public Health

Harold A. Whittaker, B.A., Assistant Professor of Preventive Medicine and Public Health

Laurence H. Cady, B.S., M.D., Instructor in Preventive Medicine and Public Health

Joseph C. Hathaway, B.S., M.D., Instructor in Preventive Medicine and Public Health

GENERAL INFORMATION

The School of Chemistry occupies a large modern building 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 chemistry library is well provided with complete sets of journals and compendia of chemical literature, among which are important sets not frequently found in university libraries. Many special laboratories for private research have been provided and facilities are available for graduate work leading to the higher degrees.

Courses and degrees.—The 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 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 government bureaus, and in the chemical industries, as teachers, analysts, or research assistants.

The course in Chemical Engineering leads to the degree of bachelor of chemical engineering at the end of four years, and to the Master's degree in chemical engineering at the end of the fifth year, which is taken in the Graduate School. It aims to give the student a broad foundation in chemistry, engineering, and allied sciences and professional preparation in chemical engineering. The professional degree of chemical engineer will be conferred upon those who have received the degree of bachelor of chemical engineering, or its equivalent, when they have completed an additional year of graduate study in this field, 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.

Students are admitted on certificate or by examination. In special cases, with the approval of the dean of the School of Chemistry, persons of mature age (twenty-four years or older) and experience may be admitted as adult special students to pursue specific courses of study.

Admission by certificate.—Applicants must present twelve units of work obtained in the last three years of high school (senior high school) of which at least nine must be included in Groups A, B, C, D, and E as listed below. These nine units must include a major of three units in one group and two minors of two units each in two other groups. Subject to these requirements, the applicant must include at least two units of English and two units of mathematics. Students who do not present *higher algebra and solid geometry* for admission will be required to take these subjects in the first quarter at the University without credit. This will usually necessitate their attending Summer Session to complete the work of the freshman year. To avoid this irregularity in their courses, students are urged to obtain the required higher algebra and solid geometry in high school or the University Summer Session or Extension Division before entering this school. Students who do not present *chemistry* for admission will be required to take an additional course in inorganic chemistry, Course 6. Students who expect to enter the School of Chemistry are urged to include in their high school courses in addition to the above, Latin, two units; German, two units; physics, one unit; ancient, modern, and American history; and American government. By presenting two units of German for admission, students may replace the first year of required college German by elective work.

List of entrance subjects.—Only those subjects included in the following groups may be counted toward admission.

The term *unit* means not less than five recitations of forty minutes each per week for a school year of thirty-six weeks. In laboratory, drawing, and other manual courses, twice this amount of class time is required for one unit.

Group A	English: 1 to 3 units.
Group B	Foreign languages: Latin, Greek, German, French, Spanish, Scandinavian, 1 to 4 units each.
Group C	History and social sciences: European history, ½ to 2 units; English history and American history, ½ or 1 unit each; economics and sociology, ½ unit each; American government, commercial geography, and history of commerce, ½ or 1 unit each.
Group D	Mathematics: elementary algebra and plane geometry, 1 unit each; unified mathematics, 2 units; higher algebra, solid geometry, and trigonometry, ½ unit each.
Group E	Natural sciences: biology, physics, and chemistry, 1 unit each; botany and zoology, ½ or 1 unit each; physiology, astronomy, and geology, ½ unit each.
Group F	Vocational and miscellaneous subjects: The three units which are not required to be in Groups A, B, C, D, E, may be in work which the superintendent certifies as being of acceptable nature and as having been counted toward the applicant's graduation.

Admission by examination.—Applicants who are high school graduates or at least nineteen years of age may be admitted provisionally and subject to one year of satisfactory work, upon passing the following tests:

a. College aptitude test
b. Test of proficiency in English
c. Test in mathematics including arithmetic, algebra, and geometry.

Time of admission.—The regular time to enter the college is in September. However, students will be admitted at the beginning of the winter quarter in January; then by attending the following Summer Session it is possible to complete most of the work of the freshman year. Admission at the opening of the spring quarter is not recommended unless the student can present advanced credit from some other college.

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 27 and 28, 1928. Fees must be paid before registration can be effected. Each student will obtain a statement of his fees at the office of the registrar, Administration Building.

All students entering this 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)	6.40
Military deposit (required of all who register for military drill)	10.00
Deposit[1] (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 ten dollars ($10) 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.

[1] This deposit is made to cover such charges as may be incurred for lockers, library penalties, laboratory breakage, etc.

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.

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 the day before registration for the next quarter. The usual fee of $5 must be paid for permission to repeat any Junior Review Examination in which a failure has been received.

5. Students who transfer to the School of Chemistry from another college or another institution will be required to take and pass the Junior Review Examinations in those subjects for which they have received advanced standing, before entering courses having numbers greater than 53, with the exception of 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 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 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 17½ 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 applications before March 1 with the dean of the Graduate School. The Shevlin fellow devotes his entire time to graduate work and is not required to render any service to the University.

The 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 to $750 per annum. They are required to devote twelve hours per week to instruction and other assigned work. They thereby obtain valuable experience in laboratory teaching under competent direction. In addition to these duties, each assistant is expected to pursue graduate work toward a higher degree.

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 University Young Men's Christian Association.

Freshmen, in particular, are advised that the work of the first year in this college will require their closest attention and application if they are to succeed. They should refrain from participation in unnecessary outside activities, while bearing in mind the importance of physical as well as mental development.

Handbook for students.—Regulations and instructions for the guidance of students are issued at the time of registration in the form of a small pamphlet 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.

Societies.—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. There is also a student branch of the American Institute of Chemical Engineers.

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 11 (College Algebra). Students in Course 11 who show in the first two weeks that they are not prepared to continue in that course will be advised to transfer to Course 9, to strengthen their mathematical preparation. Course 9 will be followed by Courses 11, 12, 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, unless, owing to excellent work in Course 6, they are permitted to change to Course 9.

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. 11	College Algebra	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. 12	Trigonometry	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

Third Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
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]				

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[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.

Third Quarter[2]

Course No.	Title	Credits	Lect.	Rec.	Lab.
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 33	Optics	3	3	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. 28	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. 138	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.

Third Quarter

Course No.	Title	Credits	Lect.	Rec.	Lab.
Org. Chem. 53	Organic Chemistry	5	3	1	6
Chem. Engr. 101	Unit Processes	4	4	1	3
M.E. 139	Heat Engines	3	2	..	4
Physics 33	Optics	3	3	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 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

[1] In one of the quarters 3 credits must be elected in metallography or mineralogy. See page 19 for list.

Third Quarter

Course No.	Title	Credits
Econ. 28	Business Law	3

JUNIOR YEAR

First Quarter

Course No.	Title	Credits
Econ. 29	Principles of Accounting	3

Second Quarter

Econ. 89	Production Management	3

Third Quarter

Econ. 155	Corporation Finance	3

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; 11f,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. 1. 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, Mr. Pervier.

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. Stephens, Mr. Heisig.

6f-7w-8s. General Inorganic Chemistry. 6. Includes a study of general laws of chemistry and of non-metals and their compounds. 7. Continuation of Course 6. 8. 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, Miss Cohen, Mr. Kirk, Mr. Reyerson.

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. Miss Cohen, 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, Mr. Kirk, Mr. Maynard.

14f-15w. General Inorganic Chemistry. (Engineers, miners, and pharmacists.) 14. Includes a study of the general laws of chemistry and of the non-metals, the metals, and their compounds. 15. Continuation of Course 14. 5 cred. per qtr.; no prereq. Mr. Barber, Mr. Maynard.

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. Barber, Mr. Heisig, Mr. Maynard.

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.

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.

106f-107w-108s. Chemistry of the Rare Elements. History, occurrence, preparation, and properties of the less usual elements and their compounds. Use of the microscope and the spectroscope in following the course of the purification. 3 cred. per quarter; prereq., Anal. Chem. 1 or 2, or by permission. Mr. Kirk.

301f-302w-303s. Research in Inorganic Chemistry. Credits to be arranged. Mr. Sneed, Mr. Reyerson.

ANALYTICAL CHEMISTRY

1w-2s. Quantitative Analysis. Introductory courses covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention given to proper laboratory practice. Course 1, Gravimetric Analysis. Course 2, Volumetric Analysis. 5 cred. per qtr.; prereq.. Inorg. Chem. 13. Mr. Geiger.

7f,w,s. 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. 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. 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.

131f. Applications of Indicators in Neutralization Reactions and of p_h Determinations. 3 cred.; prereq., Anal. Chem. 1 and 2 and Physical Chemistry 103. Mr. Kolthoff.

132w-133s. Electrometric Measurements and Titrations. The application of potentiometric and conductometric methods in analytical work. 3 cred.; prereq., Anal. Chem. 1 and 2 and Physical Chemistry 103. Mr. Kolthoff.

134f,w,s. Seminar: Modern Problems in Analytical Chemistry. 1 cred.; prereq.. Anal. Chem. 1 and 2, and Physical Chemistry 103. Mr. Kolthoff.

301f-302w-303s. Research in Quantitative Analysis. Cred. ar. Mr. Kolthoff, Mr. Geiger, Mr. Sarver.

ORGANIC CHEMISTRY

1f,s-2w. Elementary Organic Chemistry. (Pre-med., pre-dent., 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.

1w-2s,f. Elementary Organic Chemistry. (Pre-med., pre-dent., 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. Smith.

51f-52w-53s. 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. Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure, reaction, mechanism, and relation of physical properties to constitution. May be accompanied by appropriate laboratory work in Organic Chemistry 137, 139. 3 cred. per qtr.; prereq., 53. Mr. Hunter.

111f. 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 Organic 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 1928-29.) Mr. Smith.

115s. The Heterocyclic Compounds. A discussion of the nomenclature, preparation, properties, and uses of the typical heterocyclic systems. May be accompanied by appropriate laboratory work in Organic Chemistry 139. 3 cred.; prereq., 53. (Not offered in 1929-30.) Mr. Smith.

116w. The Cycloparaffins and Their Derivatives. A study of the chemistry of the cycloparaffins and their oxygen derivatives, together with their unsaturated analogs. In the terpene series, attention is also given to related open chain compounds and to the polyterpenes, particularly rubber. 3 cred.; prereq., 53. Mr. Stephens.

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. 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. Organic Chemistry Seminar. 1 hr. per week. 1 cred. Open only to students taking research in organic chemistry. Mr. Hunter.

301f-302w-303s. Research in Organic Chemistry. Cred. ar. Mr. Hunter, Mr. Smith, Mr. Lauer.

PHYSICAL CHEMISTRY

96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.

101f-102w-103s. 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. Application of Higher Mathematics to Chemical Problems. 3 lect.; 3 cred.; prereq., integral calculus. Mr. MacDougall.

110f,w. Physical Chemistry. (Designed chiefly for medical and biological students.) 4 cred. per qtr.; prereq., Org. Chem. 2. Mr. Taylor.

116f-117w-118s. Advanced Physical Chemistry. 3 lect. and 1 rec.; lab. work for one 3-hour period may be taken if desired; 3 cred. per qtr. or 4 with lab.; prereq., 103 and calculus. Mr. Taylor.

129s. Principles of Colloidal Chemistry. 2 cred.; prereq., 101. Mr. Reyerson.

130s. Application of Colloidal Chemistry. 2 cred.; prereq., 101. (Not offered in 1928-29.) Mr. Reyerson.

131f-132w-133s. 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. 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 1928-29.) Mr. MacDougall.

204f-205w-206s. Kinetic Theory and Atomistics. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. 4 cred. per qtr.; prereq., 103 and calculus. Mr. MacDougall.

211f-212w-213s. Advanced Physical Chemistry Laboratory. To accompany or follow any of the advanced courses in physical chemistry. Cred. ar.; prereq., 103. Mr. MacDougall.

251f-252w-253s. Physical Chemistry Seminar. 1 hr. a week. For students taking advanced courses in physical chemistry. 1 cred. per qtr. Mr. MacDougall.

301f-302w-303s. 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. 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. 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. 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. Exact Gas Analysis. 1 or 2 cred.; prereq., Anal. Chem. 1, 2. Mr. Harding.

104s. 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. 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. 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. 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. Research Work in Technological Chemistry. Cred. ar. Mr. Harding.

CHEMICAL ENGINEERING

31f. Chemistry of Engineering Materials. The application of general chemistry to engineering practice. Consideration of the chemistry and properties of wood, iron and steel, alloys, fuels, water, cements, paints, bitumens, etc. Lectures and recitations. 3 cred.; prereq., Inorg. Chem. 16. For engineers. Mr. Montonna.

41s. Gas Manufacture and Distribution. Fundamental principles of manufacture of coal gas, carbureted water gas, and other industrial fuel gases, and the apparatus for manufacture and distribution. Open to sophomores in the College of Engineering 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, bat-

teries, electroplating, electric furnace construction and operation, and electrochemical products. Open to engineers. Class and laboratory work. 3 cred. Mr. Ruth.

96f-97w-98s. Senior Thesis. Open to seniors. 5 cred. per qtr.

101s. 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. 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. 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. Unit Process Problems. Problems in leaching and dissolving, countercurrent extraction, gas absorption, and distillation. Drying by air, steam, and direct heat dryers. 2 cred.; prereq., 101. Mr. Montillon.

111f-112w-113s. 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. 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. 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. Chemistry of Explosives. The history and development of modern explosives, their manufacture and uses. Lectures, required reading, and reports. 4 cred.; prereq., 132. Mr. Montonna.

134s. 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. 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. 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. Chemical Manufacture (Inorganic). Manufacture of technical products on a scale large enough to afford data for the determination of costs of manufacture. Use of semiplant scale equipment. Technical trade journals used. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.

152w,su. Chemical Manufacture (Organic). Similar to 151 but covering the organic field. Laboratory. 3 or more cred.; prereq., 101. Mr. Montonna.

153f-154w-155s-156su. Special Laboratory Problems. Laboratory investigations on equipment and the manufacture of special chemical products on a large scale. 3 or more cred.; prereq., 151, 152. 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., 132 or ar. Mr. Montonna.

176f-177w. Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electroplating, electric furnace construction and operation, and electrochemical products. Class and laboratory work. 4 cred. per qtr.; prereq., Phys. Chem. 103. Mr. Montillon.

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. Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. 1 cred. per qtr. Mr. Montillon.

301f-302w-303s. Research in Chemical Engineering. Unit processes, applied electrochemistry and electric furnace work, and chemical manufacture. Cred. 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.10f. 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. 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. 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. per qtr.; 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.

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.

161f,w. Labor Problems and Trade Unionism. 3 cred.; prereq., 8, 9. Mr. Hansen.

BUSINESS ADMINISTRATION

67f,w,s. Market Administration. 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.

71f,w,s. Traffic Management. A survey of the rail, water, and highway transportation facilities, services, rates and laws in their relation to business establishments; the executive's organization and management problems in handling freight, express, and mail shipments. 3 cred.; prereq., 8-9. Mr. Butterbaugh.

73w. Transportation Charges. The principles, construction, interpretation, and use of rail, water, and highway classifications, rates and tariffs, for the handling of freight, express, and mail shipments. The audit of transportation charges and the adjustment of rates, rules, and regulations. 3 cred.; prereq., 71. Mr. Butterbaugh.

89f,w,s. Production Management. Types of operating organizations; 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. 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.

133s. Cost Accounting Systems. A study of cost accounting as applied to specific plants and industries. Actual cost systems are studied and criticized. Each student analyzes and reports on a system in actual operation. 3 cred.; prereq., 130 or 131. Mr. Ostlund.

167w. Personnel Administration. Managerial policy for various types of organization on labor. Special attention to job analysis, employment, incentives, and regulation of employment. 3 cred.; prereq., 8-9. 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. 3 cred.; prereq., 167. Mr. Stead.

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. Ryan.

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 MINERALOGY[1]

67w. Mineralogy of Chemical Materials. Lectures on special laboratory methods of mineralogy, nature and identification of the chief commercial minerals, and the world's supply and market for the same. Laboratory work in identification and tests of the value of minerals. 3 cred.; prereq., 6 qtr. cred. of chemistry at University. Mr. Gruner.

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. Miss Wangsness, Miss Bertsch.

27f. Narrative Prose. Reading, grammar review. 3 cred.; prereq., 26 or two years preparatory German. Mr. Davies, Mr. Ermisch.

28w-29s. Advanced Chemical German. Selections from more difficult works on chemistry. 3 cred. per qtr.; prereq., 27. Mr. Davies, Mr. Ermisch.

MATHEMATICS AND MECHANICS

MATHEMATICS

9f,w,(su). Higher Algebra. (High school.) Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, comp'ex quantities, quadratic equations, numerical exercises. Without credit. Mr. Brooke.

10f,w,(su). Solid Geometry. See Course 10f under Department of Drawing and Descriptive Geometry.

11f,w,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.

[1] For other courses in the Department of Geology and Mineralogy, see bulletin of the College of Sci nce, Literature, and the Arts.

12w,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. Siler.

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, asymtotes, singular points, applications to geometry of space. 5 cred.; prereq., 13.

25f,w,s,(su). 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. Dalaker.

MECHANICS

84s. Technical Mechanics. (For chemical engineers.) Statics, resolution of forces, conditions and 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.

MATERIALS

85f. Strength of Materials with Laboratory. (Chemical engineers.) Mechanical and elastic properties of materials of construction, beams, shafts, columns, combination stresses, dynamic stresses. 4 cred.; prereq., 84.

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.

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.

28f. 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.

138w. 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.

139s. Heat Engines. Elementary study of steam turbines and gas engines; gas producers. Refrigeration. Air compressers. Includes 4 hrs. work in lab. each week. 3 cred.; prereq., 138. 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, Mr. Dowdell.

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, Mr. Dowdell.

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.

165. 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 equiv. 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 the 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, Mr. Pease.

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, Mr. Pease.

MILITARY SCIENCE AND TACTICS

REQUIRED WORK

All physically fit male students are required to take instruction in military science for three hours each week during the first two undergraduate years of their course. Previous instruction in this subject at other institutions under an officer of the regular army detailed as professor of military science and tactics exempts the student from so much of this work as the length of his prior training justifies in each case. All students taking this course are given the instruction prescribed for the Basic Course, Senior Division, R.O.T.C. 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

[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.

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.

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 (37mm. 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. Mr. 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 value of different sports. Fall: swimming. Winter: winter sports, tumbling. Spring: golf, soccer, handball. 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, Mr. L. J. Cooke. No cred.; no prereq. Mr. Iverson.

30s. Athletic Training and First Aid. Principles governing conditioning of men for various sports; diet, sleep, exercise, bathing, massage. Overtraining, its cause, diagnosis, prevention, and cure. Prevention and first aid treatment of common athletic injuries. 2 cred.; no prereq. Mr. 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 consultation 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 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

[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.

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. Miss Norris.

4f,w,s. Preliminary Hygiene. 1 lecture a week. The most essential aspect of the care of personal health. No cred.; no prereq. Required of all new students. Miss 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., 23, or registration in 23. Mr. Miller.

33f,w,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,w,s. Optics Laboratory. The laboratory part supplementing Course 33. One two-hour session in the laboratory a week. 1 cred.; prereq., 33, or registration in 33. 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., 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. Physiologic Chemistry. Metabolism of proteins, fats, carbohydrates in health and disease. 3 cred.; prereq., physics and Organic Chemistry 53. Mr. McClendon.

101xs,su. Physiologic Chemistry. Application of physical chemistry to Physiology. 3 cred.; prereq., Physiology 100x and physical chemistry. Mr. McClendon, Mr. Pettibone.

100yw-101ys. Physiologic Chemistry Laboratory. 2 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. Hathaway.

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.) Mr. Lees.

50f,w,su. Public and Personal Health. 3 cred.; prereq., Zoology 1 and 2, and Psy. 1 and 2. Mr. O'Brien.

The Bulletin *of the* University *of* Minnesota

School of Chemistry
Part II

Announcement of Program for the Year
1928-1929

Vol. XXXI No. 48 August 2 1928

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Act of October 3, 1917, authorized July 12, 1918

FRESHMAN WEEK

Every student entering any department of the University for the first time as a freshman in the fall of 1928 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 21, Saturday, September 22, or Monday, September 24, to begin the process of registration. Those coming later than 5:00 p.m. Monday, September 24, will be subject to the usual penalty for late registration. See Penalty Fees, page 44 of the bulletin of general information.

During the week September 25 to 29, 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 21, in order to avoid the inconvenience and delay incident to the congestion on the last day.

Any applicants who have not taken the psychological and English tests must report on Friday, September 21, and take these tests before they will be enrolled for Freshman Week.

1928

JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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1929

JANUARY

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MAY

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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UNIVERSITY CALENDAR
1928-29

Fall Quarter

1928			
September	20	Thursday	Payment of fees closes, except for new students
September	21-24		Entrance examinations (for removal of entrance deficiencies)
			Registration of all new students entering the freshman class
September	24-28		Examinations for removal of conditions
			Physical examinations
September	24-29		Freshman Week
September	27-28		Registration days[1] for School of Chemistry and College of Engineering and Architecture
September	28	Friday	Payment of fees for new students closes
October	1	Monday	Fall quarter classes begin, 8:30[2] a.m.
October	18	Thursday	Senate meeting, 4:30 p.m.
October	20	Saturday	Homecoming Day
November	6	Tuesday	Election Day; a holiday
November	12	Monday	A holiday; (November 11, Sunday, Armistice Day)
November	29	Thursday	Thanksgiving Day; a holiday
December	6	Thursday	State Day Convocation
December	19-22		Final examination period
December	20	Thursday	Commencement Convocation
			Senate meeting, 4:30 p.m.
December	22	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	26	Wednesday	Payment of fees closes for all students in residence fall quarter[3]

Winter Quarter

1929			
January	2-4		Entrance examinations
January	5	Saturday	Registration day for students in School of Chemistry and College of Engineering and Architecture, 8:30 a.m. to 3:00 p.m.

[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 44.

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

January	7	Monday	Christmas vacation ends, winter quarter classes begin, 8:30[1] a.m.
February	12	Tuesday	Lincoln's Birthday; a holiday
February	21	Thursday	Charter Day Convocation
			Senate meeting, 4:30 p.m.
February	22	Friday	Washington's Birthday; a holiday
March	20-23		Final examination period
March	21	Thursday	Commencement Convocation
			Payment of fees closes for all students in residence winter quarter[2]
March	23	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

Spring Quarter

March	25-27		Entrance examinations
March	29	Friday	Good Friday; a holiday
March	30	Saturday	Registration day for students in School of Chemistry and College of Engineering and Architecture, 8:30 a.m. to 3:00 p.m.
April	1	Monday	Spring vacation ends, spring quarter classes begin, 8:30[1] a.m.
May	16	Thursday	Cap and Gown Day Convocation
			Senate meeting, 4:30 p.m.
May	30	Thursday	Memorial Day; a holiday
June	12-15		Final examination period
June	15	Saturday	Spring quarter closes, 5:20 p.m.
June	16	Sunday	Baccalaureate service
June	17	Monday	Fifty-seventh annual commencement

Summer Quarter 1929

June	18-19		Registration, first term
June	20	Thursday	Classes begin, 8:00 a.m.
July	4	Thursday	Independence Day; a holiday
July	27	Saturday	Registration and payment of fees for second term closes. First term closes
July	29	Monday	Second term classes begin
August	31	Saturday	Second term closes

[1] First hour classes begin at 8:15 at University Farm.

[2] 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 44.

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.

SCHOOL OF CHEMISTRY

ADMINISTRATION

O. M. Leland, Dean.....127C and 133E
S. C. Lind, Director..... 127C
I. W. Geiger, Chairman, Advanced Standing Committee..... 127C
N. C. Pervier, Chairman, Students' Work Committee..... 127C
H. H. Barber, Superintendent, Supply and Equipment..... 226C

OFFICES OF DIVISIONS

Inorganic Chemistry 245C
Analytical Chemistry 323C
Organic Chemistry 327C
Physical Chemistry 237C
Technological Chemistry 229C
Chemical Engineering 35C

OFFICES OF OUTSIDE DEPARTMENTS

Drawing and Descriptive Geometry 208E
Economics 113B
Electrical Engineering 135EE
English 108E
Geology and Mineralogy.....108P
German 211F
Mathematics and Mechanics.....114E
Mechanical Engineering 103ME
Metallography 306M
Metallurgy 103M
Military Science and Tactics....A
Physical Education for Men....106A
Physical Education for Women 101WGm
Physics 20Ph
Physiologic Chemistry 307MH
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 Laboratories, 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, sol'd 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 33	3
				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 33 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 33	3
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 13 elective credits, 3 of which must be in metallography or mineralogy.

PROGRAM
1928-29
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	Mr. Reyerson
	Lab. (a)	VI-VII	TTh	110C	
	or (b)	VIII-IX	TTh	110C	
	Sec. 2 (Agr.) fall, winter				
	Lect.	VII	MWF	100C	Mr. Pervier
	Lab.	VIII-IX	MW	110C	
	Sec. 2 (Agr.) spring				
	Lect.	VII	MF	225C	Mr. Pervier
		IV	S	225C	
	Lab.	VIII-IX	MF	110C	
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	
	Quiz	VIII	M	100C	
	Sec. 2 (Engrs.)				
	Lect.	IV	T	225C	Mr. Heisig
		IV	S	100C	
		VI	Th	100C	
	Lab.	II-IV	M	110C	
	Quiz	VIII	M	100C	
	Sec. 3 (Engrs.)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	III-V	T	110C	
	Quiz	VIII	M	100C	
	Sec. 4 (Pre dent., pre-med.)				
	Lect.	II	TThS	325C	Mr. Stephens
	Lab. (a)	VI-VII	TTh		
	or (b)	VIII-IX	TTh	210C	
	Sec. 5 (Pre-dent., pre-med.)				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab. (a)	VI-VII	TTh	210C	
	or (b)	VIII-IX	TTh	210C	
5w	General Inorganic Chemistry.....				
	(4 cred. per qtr.; prereq., 4)				
	Sec. 1 (Engrs.)				
	Lect.	IV	T	225C	Mr. Heisig
		VI	Th	100C	
		IV	S	100C	
	Lab.	VI-VIII	F	110C	
	Quiz	VII	M	305E	
	Sec. 2 (Engrs.)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	III-V	T	110C	
	Quiz	VII	M	305E	
	Sec. 3 (Pre-dent., pre-med.)				
	Lect.	II	TThS	325C	Mr. Stephens
	Lab. (a)	VI-VII	TTh		
	or (b)	VIII-IX	TTh	210C	
	Sec. 4 (Pre-dent., pre-med.)				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab. (a)	VI-VII	TTh	210C	
	or (b)	VIII-IX	TTh	210C	

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	
9f-10w	General Inorganic Chemistry.....				
	(5 cred. per qtr.; prereq., high school chem.)				
	Sec. 1 (Agr.)				
	Lect.	VII	MWF	225C	Mr. Reyerson
	Lab.	VIII-IX	MWF	110C	
	Sec. 2 (Chem., S.L.A.)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I-III	ThS	290C	
9w-10s	General Inorganic Chemistry.....				
	(5 cred. per qtr.; prereq., high school chem.)				
	Lect. (Both secs.)	III	MWF	100C	Mr. Kirk,
	Lab. Sec. 1 (Engrs.)	V-VI	MWF	290C	Miss Cohen
	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	
11s	Qualitative Chemical Analysis.....				
	(4 cred.; prereq., 3 or 5)				
	Sec. 1				
	Lect.	II	TThS	325C	Mr. Stephens
	Lab. (a)	VI-VII	TTh	210C	
	or (b)	VIII-IX	TTh	210C	
	Sec. 2				
	Lect.	VI	MWF	100C	Mr. Stephens
	Lab. (a)	VI-VII	TTh	210C	
	or (b)	VIII-IX	TTh	210C	
12f	Qualitative Chemical Analysis.....				
	(5 cred.; prereq., 8 or 10)				
	Lect.	I	TThS	325C	Mr. Maynard
	Lab.	VI-VIII	MW	290C	
12s	Qualitative Chemical Analysis.....				
	(5 cred.; prereq., 8 or 10)				
	Lect.	II	MWF	100C	Mr. Sneed
	Lab.	I-III	ThS	290C	
13f	Qualitative Chemical Analysis.....				
	(5 cred.; prereq., 12)				
	Lect.	VI	WF	490C	Mr. Kirk
	Lab.	VII-IX	WF	290C	
		VI-VIII	M	290C	
13w	Qualitative Chemical Analysis.....				
	(5 cred.; prereq., 12)				
	Lect.	VI	WF	490C	Mr. Maynard
	Lab.	VII-IX	MWF	290C	
14f-15w	General Inorganic Chemistry.....				
	(5 cred. per qtr.; no prereq.)				
	Sec. 1 (Engrs.)				
	Lect.	II	TThS	100C	Mr. Barber
	Lab.	VI-IX	T	110C	
		VI-VII	Th	110C	
	Quiz	VIII	F	490C	

No.	Title	Hour	Day	Bldg.	Instructor
	Sec. 2 (Miners)				
	Lect.	II	TThS	100C	Mr. Barber
	Lab.	VII-IX	T	110C	
		VI-VIII	Th	110C	
	Sec. 3 (Pharm., phys. ed.)				
	Lect.	I	MWF	325C	Mr. Maynard
	Lab.	VI-VIII	TTh	290C	
16s	Qualitative Chemical Analysis..... (5 cred.; prereq., 5 or 15)				
	Sec. 1 (Engrs.)				
	Lect.	VII	MWF	100C	Mr. Heisig
	Lab.	IV-V	T	110C	
		VI-IX	Th	110C	
	Sec. 2 (Engrs.)				
	Lect.	I	TThS	100C	Mr. Heisig
	Lab.	VI-IX	M	110C	
		VI-VII	W	110C	
	Sec. 3 (Engrs. and miners)				
	Lect.	II	TThS	100C	Mr. Barber
	Lab.	VIII-IX	W	110C	
		VI-IX	F	110C	
	Sec. 4 (Pharm.)				
	Lect.	I	MWF	325C	Mr. Maynard
	Lab.	VI-VIII	TTh	290C	
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 (Inorganic) ..... (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 (Qualitative 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, Mr. Kirk
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

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	Mr. Geiger
		Lab.	VII-IX	M	310C	
			VIII-IX	W	310C	
			VI-IX	F	310C	
	Sec. 2	Rec.	VI	F	315C	Mr. Geiger
		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 35)	VI	W	315C	Mr. Geiger
		Lab.	VII-IX	MW	310C	
			VI-VII	F	310C	
	Sec. 2	Rec. (limit 35)	VI	F	315C	Mr. Geiger
		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 S	310C	
7w,s	Quantitative Analysis ..... (Same as 7f, Sec. 3)					Mr. Sarver
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	
131f	Application of Indicators in Neutralization Analysis and p_H Determination ..... (3 cred.; prereq., Anal. Chem. 1 and 2 and Physical Chem. 101, 102, 103)					
		Lect.	II	TThS	315C	Mr. Kolthoff
		Lab.	III-IV	TThS		

No.	Title	Hour	Day	Bldg.	Instructor
132w-133s	Electrometric Measurements and Titrations ..... (3 cred.; prereq., Anal. Chem. 1 and 2)				
	Lect.	II	TThS	315C	Mr. Kolthoff
	Lab.	Ar	Ar		
134f,w,s	Seminar: Modern Problems in Analytical Chemistry ..... (1 cred.; prereq., Anal. Chem. 1 and 2 and Phys. Chem. 101, 102, 103)	Ar	Ar		Mr. Kolthoff
301f-302w-303s	Research in Quantitative Analysis.. (Cred. ar.)	Ar	Ar	ArC	Mr. Geiger, Mr. Kolthoff, Mr. Sarver

ORGANIC CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f,s-2w	Elementary Organic Chemistry (Predent., pre-med., 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	
	6	VI-IX	Th	390C	
	7	VI-IX	F	390C	
1w-2f,s	Elementary Organic Chemistry (Premed., pre-dent., pharm.)..... (4 cred. per qtr.; prereq., Inorg. Chem. 11)				
	Lect. (all secs.)	IV	MWF	100C	Mr. Smith
	Lab. Conference (all secs.)	IV	T	100C	Mr. Smith
	Quiz (all secs.)	V	T	Ar	Ar
	Lab. Sec. 1	VI-IX	M	390C	
	2	VI-IX	W	390C	
	3	VI-IX	Th	390C	
	4	VI-IX	F	390C	
	5	I-IV	S	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	
101f-102w-103s	Advanced Organic Chemistry..... (3 cred. per qtr.; prereq., 53)	III	TThS	315C	Mr. Hunter
111f	Reagents in Organic Chemistry.... (3 cred.; prereq., 53)	II	MWF	325C	Mr. Smith

No.	Title	Hour	Day	Bldg.	Instructor
113s	The Aliphatic Compounds ..... (3 cred.; prereq., 53)	(Not offered in 1928-29)			
115s	The Heterocyclic Compounds..... (3 cred.; prereq., 53)	II	MWF	315C	Mr. Smith
116w	The Terpenes ..... (3 cred.; prereq., 53)	Ar	Ar	ArC	Mr. Stephens
122w	The Aromatic Compounds..... (3 cred.; prereq., 53)	Ar	Ar	ArC	Mr. Lauer
123s	Dyes ..... (3 cred.; prereq., 53)	II	TThS	111C	Mr. Lauer
137f	Advanced Organic Chemistry Laboratory Work ..... (2 to 5 cred.; prereq., 53)	Ar	Ar	ArC	Mr. Lauer
139f,w,s	Advanced Organic Chemistry Laboratory Work ..... (2 to 5 cred.; prereq., 53)	Ar	Ar	ArC	Mr. Hunter
201f-202w-203s	Organic Chemistry Seminar..... (1 cred. per qtr.; open only to students taking research in organic chem.)	Ar	Ar	ArC	Mr. Hunter
301f-302w-303s	Research in Organic Chemistry.... (Cred. ar.)	Ar	Ar	ArC	Mr. Hunter, Mr. Lauer, Mr. Smith

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 117C	Mr. Livingston
	Sec. 2 (Others) Rec.	IV	S	115C	Mr. MacDougall
	Lab.	VI-VIII	F	15C 117C	
105w	Application of Higher Mathematics to Chemical Problems ..... (3 cred.; prereq., integral calculus)	Ar	Ar	ArC	Mr. MacDougall
110f,w	Physical Chemistry ..... (4 cred.; prereq., Org. Chem. 7)				
	Lect. (Both secs.)	VI	TTh	225C	Mr. Taylor
		VI	F	325C	
	Lab. Sec. 1	I-III	MW	15C	Mr. Taylor
	2	VII-IX	TTh	117C	Mr. Taylor
116f-117w-118s	Advanced Physical Chemistry..... (3 cred. per qtr. or 4 with lab.; prereq., 103 and calculus)	Ar	Ar	ArC	Mr. Taylor
129s	Principles of Colloid Chemistry.... (2 cred.; prereq., 102)	Ar	Ar	ArC	Mr. Reyerson
130s	Applications of Colloid Chemistry.. (2 cred.; prereq., 102)	(Not offered in 1928-29)			
131f-132w-133s	Colloid Chemistry Laboratory..... (Cred. ar.; prereq., cred. or registration in 129 or 130)	Ar	Ar	ArC	Mr. Reyerson

No.	Title	Hour	Day	Bldg.	Instructor
144s	Magnetochemistry ..... (3 cred.; jr., sr.; prereq., 103)	Ar	Ar	ArC	Mr. Taylor
161f-162w-163s	Radioactivity ..... (2 cred. per qtr.; prereq., Phys. Chem. 103)	Ar	Ar	ArC	Mr. Lind
164f,w,s	Radioactivity Laboratory ..... (Must be preceded or accompanied by Radioactivity 161)	Ar	Ar	ArC	Mr. Lind
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)	(Not offered in 1928-29)			
204f-205w-206s	Kinetic Theory and Atomistics.... (4 cred. per qtr.; prereq., 103 and calculus)	II	TThS	115C	Mr. MacDougall
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. MacDougall, Mr. Taylor

TECHNOLOGICAL CHEMISTRY

No.	Title	Hour	Day	Bldg.	Instructor
1f	Power Plant Chemistry (Engrs.)... (3 cred.; prereq., Inorg. Chem. 16)				
	Lect. (Both secs.)	VI	Th	115C	Mr. Brewer
	Rec. (Both. secs.)	I	S	115C	
	Lab. Sec. 1	I-III	MF	10C	
	2	I-III	W	10C	
		II-IV	S	10C	
1w	Power Plant Chemistry (Engrs.)... (3 cred.; prereq., Inorg. Chem. 16)				
	Lect. (Both secs.)	VI	Th	115C	Mr. Brewer
	Rec. (Both. secs.)	I	S	115C	
	Lab. Sec. 1	II-IV	MF	10C	
	2	I-III	T	10C	
		II-IV	S	10C	
1s	Power Plant Chemistry (Engrs.)... (3 cred.; prereq., Inorg. Chem. 16)				
	Lect.	I	M	115C	Mr. Brewer
	Rec.	I	F	115C	
	Lab.	II-IV	MF	10C	
2w	Boiler Water (Engrs.)..... (3 cred.; prereq., 1)				
	Lect.	I	T	215C	Mr. Harding
	Lab.	VI-IX	TTh	10C	

No.	Title	Hour	Day	Bldg.	Instructor
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	
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
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.	VII-IX	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 Chemistry ..... (Cred. ar.)	Ar	Ar	ArC	Mr. Harding

CHEMICAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
31f	Chemistry of Engineering Materials (3 cred.; prereq., Inorg. Chem. 16)	IV	MWF	315C	Mr. Montonna
41s	Gas Manufacture and Distribution (3 cred.; open to soph. in College of Eng. who have completed 1 year of chemistry)	Ar	Ar	ArC	Mr. Montillon
76f-77w	Applied Electrochemistry ..... (3 cred. per qtr.; open to soph., jr., and sr. engrs.)				
	Lect.	Ar	Ar	ArC	Mr. Ruth
	Lab. Sec. 1	Ar	Ar	25C	
	2	Ar	Ar	ArC	
101s	Unit Processes ..... (4 cred.; prereq., Anal. Chem. 1, 2, Org. Chem. 52)	I	MTWThF	111C	Mr. Mann
	Lab. Sec. 1	VII-IX	M	90C	Mr. Montonna,
	2	VII-IX	W		Mr. Ruth
	3	I-III	S		

No.	Title	Hour	Day	Bldg.	Instructor
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	II-IV	M	410C	Mr. Montillon
	(2 cred. per qtr.; prereq., 131, 132)	VI-VIII	M	410C	
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
133f	Chemistry of Explosives..... (4 cred.; prereq., 132)				
	Lect.	IV	TS	215C	Mr. Montonna
		V	Th	215C	
134s	Intermediates and Dye Stuffs..... (3 cred.; lab. optional (See 160); prereq., 132 or equivalent)	Ar	Ar		
136w	Chemistry and Technology of Cellulose ..... (3 cred.; prereq., Org. Chem. 52 or equivalent)				
	Lect.	IV	TS	215C	Mr. Montonna
		V	Th	215C	
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 Laboratory ..... (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	115C	Mr. Montillon
	Lab.	VI-VIII	W or Th	25C	
179s	Advanced Applied Electrochemistry (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 students 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	MTF	443C	Mr. Schuck,
	2	VIII-IX	MTF	445C	Mr. Williams
5w	Engineering Drawing	VII-IX	MW	443C	Mr. Williams
	(2 cred.; prereq., 4)	VI-VIII	Th		
6s	Engineering Drawing and Descriptive Geometry	VIII-IX	M	101E	Mr. Williams
	(2 cred.; prereq., 5)	III-IV	T		
		VII-VIII	F		
7w	Engineering Drawing	VIII-IX	M	445C	Mr. Schuck
	(3 cred.; prereq., M.&M. 10)	VII-IX	TW	445C	
8s	Engineering Drawing and Descriptive Geometry	VII-IX	MF	445C	Mr. Schuck
	(3 cred.; prereq., 7)	I-II	T	445C	
9f,w,s	Drafting	Ar	Ar	Ar	Mr. French
	(2 to 6 cred.; prereq., 6 or 8)				
M.&M.10f	Solid Geometry				
	(No cred.; no prereq.)				
	Sec. 5	VII	MWF	7E	Mr. Archibald
		VIII	W	7E	
M.&M.10w	Solid Geometry	IX	MWF	5E	
	(No cred.; no prereq.)	VI	T		
34f,w,s	Lettering				
	(1 cred.; prereq., 4 or 7)				
	Sec. 1	IV	T	107E	Mr. Archibald
	2	II	Th	139EE	
45f,w,s-46f,w,s	Alphabets	II	TTh	206E	Mr. Kirchner,
	(2 cred. per qtr.; no prereq.)				Mr. Schuck
57f-58w-59s	Graphical Methods	I	WF	206E(f)	Mr. Levens
	(2 cred. per qtr.; prereq., 23, 27, or 29 and M.&M. 84)			7E(w,s)	

ECONOMICS

ECONOMICS

No.	Title	Hour	Day	Bldg.	Instructor
8f-9w	General Economics				
	(3 cred. per qtr.; no prereq.)				
	Sec. 1	I	MWF	107E	Mr. O'Hara
				22E (spring)	
	2	I	MWF	21E	
	3	III	MWF	135E	
	4	IV	MWF	203E	
	5	IV	MWF	335EE	
28f,s	Business Law	I	MWF	135E	Mr. Palmer
	(3 cred.; prereq., 8-9)				
29f,s	Principles of Accounting.....	I	MWF	22E	Mr. Heilman
	(3 cred.; no prereq.)				
51f-52w-53s	Business Law	See Political Science 51-52-53			
161f	Labor Problems and Trade Unionism	IV	MWF	202B	Mr. Hansen
	(3 cred.; jr., sr.; prereq., 8, 9)				
161w	Labor Problems and Trade Unionism	III	TThS	109B	Mr. Hansen
	(3 cred.; jr., sr.; prereq., 8, 9)				

BUSINESS ADMINISTRATION

No.	Title	Hour	Day	Bldg.	Instructor
67f,w,s	Market Administration ..... (3 cred.; prereq., 8, 9)	I	TThS	209B(f,w) 202B(s)	Mr. Vaile
71f,w,s	Traffic Management ..... (3 cred.; jr., sr.; prereq., 8, 9)	VI	MWF	202B	Mr. Butterbaugh
73w	Transportation Charges ..... (3 cred.; jr., sr.; prereq., 71)	VII	MWF	202B	Mr. Butterbaugh
89f,w,s	Production Management ..... (3 cred.; prereq., 8, 9)	II	MWF	202B	Mr. O'Hara
130s	Cost Accounting (General Survey) (3 cred.; prereq., 29)	I	TThS	303B	Mr. Ostlund
131f-132w*	Cost Accounting ..... (3 cred. per qtr.; prereq., 29)	II	TThS	301B	Mr. Ostlund
133s	Cost Accounting Systems..... (3 cred.; prereq., 131 or 130)	II	TThS	301B	Mr. Ostlund
167w	Personnel Administration ..... (3 cred.; prereq., 8, 9)				
	Sec. 1	I	TThS	202B	Mr. Stead
	2	II	TThS	109B	
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	Ar
		III	S	138EE	Ar
	Lab.	I-II	S	107EE	Ar

ENGLISH

No.	Title	Hour	Day	Bldg.	Instructor
4f-5w-6s	Rhetoric and Composition..... (3 cred. per qtr.; no prereq.)				
	Sec. 1	III	MWF	335EE	
	2	III	MWF	107E	Mr. Creamer
4w	Rhetoric and Composition..... (3 cred. per qtr.; no prereq.)				
	Sec. 1	VI	TThS	107E	Ar
	2	VIII	MWTh	107E	Ar
5s	Rhetoric and Composition..... (3 cred.; prereq., 4)				
	Sec. 1	I	MWF	3E	Ar
	2	V	MWF	107E	

GEOLOGY AND MINERALOGY

No.	Title	Hour	Day	Bldg.	Instructor
67w	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	

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

GERMAN

No.	Title	Hour	Day	Bldg.	Instructor
24f-25w-26s	Beginning German ..... (4 cred. per qtr.; no prereq.)	IV	MTWF	209½F	Ar
27f	Narrative Prose ..... (3 cred.; prereq., 26 or 2 yrs. prep. German)	I	MWF	108F	Ar
28w-29s	Advanced Chemical German..... (3 cred. per qtr.; prereq., 27)	II	MWF	209½F	Mr. Davis, Mr. Ermisch

MATHEMATICS AND MECHANICS

MATHEMATICS

No.	Title	Hour	Day	Bldg.	Instructor
9f	Higher Algebra ..... (No cred.; no prereq.)				
	Sec. 10	VI	MTWThF	3E	Mr. Brooke
9w	Higher Algebra ..... (See 9f)				
	Sec. 4	V	MTWFS	3E	
10f,w	(See Course 10f under Drawing and Descriptive Geometry)				
11f	College Algebra ..... (5 cred.; prereq., higher algebra)				
	Sec. 14	VI	MTWThF	21E	Ar
11w	College Algebra ..... (See 11f)				
	Sec. 11	VI	MTWF	3E	
11s	College Algebra ..... (See 11f)	IV	S	3E	
	Sec. 1	III	MTWThF	3E	
	2	VII	MWThF	3E	
		I	S	3E	
	4	IV	MTWFS	3E	
12w	Trigonometry ..... (5 cred.; prereq., M.&M. 11)				
	Sec. 11	VI	MTWF	4E	Mr. McClintock
12s	Trigonometry ..... (See 12w)	IV	S	4E	
	Sec. 11	VI	MTWThF	4E	Mr. McClintock
13f	Analytic Geometry ..... (5 cred.; prereq., 12)				
	Sec. 1	V	MTWFS	203E	Mr. Siler
	2	VI	MTWThF	215E	
	3	III	MTWThF	215E	
	5	VIII	MTWThF	215E	
13w	Analytic Geometry ..... (See 13f)				
	Sec. 1	II	MTWThF	136E	
	2	III	MWThFS	7E	
13s	Analytic Geometry ..... (See 13f)				
	Sec. 8	VI	MTWThF	104E	
24f	Differential Calculus ..... (5 cred.; prereq., 13)				
	Sec. 8	III	MWThFS	5E	
24w	Differential Calculus ..... (See 24f)				
	Sec. 6.	III	MTWThF	136E	

No.	Title	Hour	Day	Bldg.	Instructor
24s	Differential Calculus				
	(See 24f)				
	Sec. 1	I	MTThFS	21E	
	2	V	MTWFS	106E	
25f	Integral Calculus	V	MTWFS	205E	
	(5 cred.; prereq., 24)				
25w	Integral Calculus				
	(See 24f)				
	Sec. 6.	III	MTWThF	215E	Mr. Dalaker
25s	Integral Calculus				
	(See 25f)				
	Sec. 3	III	MTWThF	205E	

MECHANICS

No.	Title	Hour	Day	Bldg.	Instructor
84f	Technical Mechanics	II	MWF	36EE	
	(5 cred.; prereq., 25)	VI	TTh	36EE	
84s	Technical Mechanics	III	MWThFS	206E	
	(See 84f)				

MATERIALS

No.	Title	Hour	Day	Bldg.	Instructor
85f	Strength of Materials with Laboratory				
	(4 cred.; prereq., 84)				
	Lect.	II	MWF	206E	
	Lab.	VI-VII	M	Ex	

HYDRAULICS

No.	Title	Hour	Day	Bldg.	Instructor
86w	Hydraulics with Laboratory.....				
	(3 cred.; prereq., 84)				
	Lect.	I	MF	104E	
	Lab.	VI-VII	W	Ex	

MECHANICAL ENGINEERING

No.	Title	Hour	Day	Bldg.	Instructor
12f	Foundry				
	(2 cred.; no prereq.)				
	Lect.	I	T	116ME	Mr. Moffett
	Shop	II-IV	T	Foundry	
		VIII-IX	Th		
12w	Foundry				
	(2 cred.; no prereq.)				
	Lect.	IV	T	116ME	Mr. Moffett
	Shop	I-III	T	Foundry	
		VIII-IX	Th		
12s	Foundry				
	(2 cred.; no prereq.)				
	Lect.	VII	W	116ME	Mr. Moffett
	Shop	VIII-IX	W	Foundry	
		VII-IX	Th		
13f	Forge				
	(2 cred.; no prereq.)				
	Lect.	IV	T	116ME	Mr. Hughes
	Shop	I-III	T	Forge Shop	
		VIII-IX	Th		

No.	Title	Hour	Day	Bldg.	Instructor
13w	Forge				
	(2 cred.; no prereq.)				
	Lect.	I	T	116ME	Mr. Hughes
	Shop	II-IV	T	Forge Shop	
		VIII-IX	Th		
13s	Forge				
	(2 cred.; no prereq.)				
	Lect.	VII	Th	116ME	Mr. Hughes
	Shop	VII-IX	W	Forge Shop	
		VIII-IX	Th		
17f	Machine Shop				
	(2 cred.; no prereq.)				
	Lect.	I	T	106ME	Mr. Shipley,
	Shop	II-IV	T	Mach. Shop	Mr. Rogers
		VII-VIII	Th		
17w	Machine Shop				
	(2 cred.; no prereq.)				
	Lect.	I	T	106ME	Mr. Shipley,
	Shop	II-IV	T	Mach. Shop	Mr. Rogers
		VIII-IX	Th		
17s	Machine Shop				
	(2 cred.; no prereq.)				
	Lect.	VII	W	106ME	Mr. Shipley,
	Lab.	VIII-IX	W	Mach. Shop	Mr. Rogers
		VII-IX	Th		
28f	Machine Design				
	(3 cred.; prereq., M.&M. 26 or 84)				
	Lect.	III	S	252ME	Mr. Martenis
	Drawing	VI-IX	WF	100PPI	Mr. Flodin
138w	Heat Engines				
	(4 cred.; prereq., M.&M. 84)				
	Lect.	IV	MWF	215Ex	
	Lab.	VI-IX	F	Ex	Mr. Larson
139s	Heat Engines				
	(3 cred.; prereq., 138)				
	Lect.	VI	MW	215Ex	
	Lab.	VI-IX	F	Ex	Mr. Larson

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
163f-164w-165s	Advanced Metallography	Ar	Ar	M	Mr. Harder
	(3 cred. per qtr.; prereq., 6 cred. in metallography)				
201f-202w-203s	Advanced Metallography for Graduate Students	Ar	Ar	M	Mr. Harder
	(Cred. ar.)				

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 Metals..... (4 cred. per qtr.; prereq., 3)	I III	F TThS	108M 108M	Mr. Pease
108s	Metallurgy of Precious Metals..... (4 cred.; prereq., 107)	I III	F TThS	108M 108M	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)	VIII-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.	VII-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	T	A	
		IX	T	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	

PHYSICAL EDUCATION FOR MEN†

No.	Title	Hour	Day	Bldg.	Instructor
1f,2w,3s	Freshman Physical Education..... (No cred;* fr.; no prereq.)				
	Sec. 1	II	MW	Field House	Ar
	2	II	TTh	Field House	
	3	III	MW	Field House	
	4	III	TTh	Field House	
	5	IV	MW	Field House	
	6	VI	MW	Field House	
	7	VI	TTh	Field House	
	8	VII	MW	Field House	
	9	VII	TTh	Field House	
	10	VIII	TTh	Field House (Boxing)	
4f	Freshman Hygiene ..... (Cred.;* no prereq.)				
	Sec. 1	II	T	301F	Mr. Cooke
	2	IV	T		
	3	II	F		
4w	Freshman Hygiene ..... (Cred.;* no prereq.)				
	Sec. 1	IV	T	301F	Mr. Cooke
	2	II	F		
	3	IV	S		
4s	Freshman Hygiene ..... (Cred.;* no prereq.)				
	Sec. 1	III	M	301F	Mr. Cooke
	2	IV	T	301F	
	3	II	F	301F	
7f,8w,9s	Advanced Leaders ..... (3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	T	A	Mr. Keller
	Lab.	Ar	Ar		
10f-11w-12s	Minor Sports ..... (2 cred. per qtr.; prereq., 1, 2, and 3 or permission)				
	Lect.	IV	S	A	Ar
	Lab.	IV	MWF		
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	Ath'etic Training and First Aid.... (2 cred.; no prereq.)	I	MWF	A	Mr. Cooke

* 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 3 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.

† NOTE.—Sections limited to sixty men.

PHYSICAL EDUCATION FOR WOMEN

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w-3s*	Elementary Physical Training.....	III	MWF	3,151,153WGm	Ar
	(No cred.; no prereq.)	IV	MWF	3,151,153WGm	Ar
		VI	MWF	3,151,153WGm	Ar
		VIII	MWF	3,151,153WGm	Ar
		III	TThS	3,151,153WGm	Ar
4f	Preliminary Hygiene	I	M	201WGm	
	(No cred.: no prereq.)	II	T		
		III	W		
		IV	M		
		VI	T		
4w	Preliminary Hygiene	III	W	201WGm	
	(No cred.; no prereq.)				
4s	Preliminary Hygiene	II	T	201WGm	
	(No cred.; no prereq.)				

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.	150Ph	Mr. Erikson
	Quiz	II	Th	150Ph	
	or	IX	Th	150Ph	
3w	Elements of Mechanics and Sound..				
	(3 cred.; prereq., trig. equiv. of M.&M. 12)				
	Lect.	VIII	MWF	150Ph	Mr. Erikson
	Quiz	IX	F	150Ph	
3s	Elements of Mechanics and Sound..				
	(3 cred.; prereq., trig. equiv. of M.&M. 12)				
	Lect.	III	TThS	166Ph	Mr. Erikson
	Quiz	IX	F	150Ph	
4f	Mechanics Laboratory	VI-VII	Th	153Ph	Mr. Erikson
	(1 cred.; prereq., 3 or registration in 3)	or			
		I-II	Th	153Ph	
4w,s	Mechanics Laboratory				
	(1 cred.; prereq., 3 or registration in 3)				
	Sec. 1	VI-VII	T	153Ph	Mr. Erikson
	2	VIII-IX	T	153Ph	and assistants
	3	I-II	Th	153Ph	
	4	VIII-IX	Th	153Ph	
23f	Heat				
	(3 cred.; prereq., 3)				
	Lect.	III	TThS	166Ph	Mr. Miller
	Quiz	IX	Th	166Ph	
23w	Heat				
	(3 cred.; prereq., 3)				
	Lect.				
	Sec. 1	II	MWF	150Ph	Mr. Miller
	2	VI	MWF	150Ph	Mr. Miller
	Quiz	II	Th	150Ph	
	or	IX	Th	150Ph	

* 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.

No.	Title	Hour	Day	Bldg.	Instructor
24f	Heat Laboratory ..... (1 cred.; prereq., 4, 23, or registration in 23)				
	Sec. 1	VI-VII	M	244Ph	Mr. Miller
	2	VIII-IX	M	244Ph	and assistants
	3	VI-VII	T	244Ph	
	4	VIII-IX	T	244Ph	
24w	Heat Laboratory ..... (1 cred.; prereq., 4, 23, or registration in 23)	VI-VII	Th	244Ph	Mr. Miller
33f	Optics ..... (3 cred.; prereq., 3)				
	Lect.	I	TThS	133Ph	Mr. Buchta
	Quiz	IX	Th	133Ph	
33s	Optics ..... (See 33f)				
	Lect.	IV	MWF	133Ph	Mr. Buchta
	Quiz	VI	Th	133Ph	
34f,s	Optics Laboratory ..... (1 cred.; prereq., 33, or registration in 33)				
	Sec. 1	VI-VII	Th	236Ph	Mr. Buchta
	2	VI-VII	F	236Ph	
43w	Electricity ..... (3 cred.; prereq., 3)				
	Lect.	III	TThS	166Ph	Mr. Zeleny
	Quiz	IX	Th	166Ph	
43s	Electricity ..... (3 cred.; prereq., 3)				
	Lect.	II	MWF	166Ph	Mr. Zeleny
	Quiz	II	Th	150Ph	
	or	IX	Th	150Ph	
44w	Electricity Laboratory ..... (1 cred.; prereq., 4, 43, or registration in 43)				
	Sec. 1	VI-VII	T	231Ph	Mr. Zeleny
	2	VIII-IX	T	231Ph	and assistants
	3	VI-VII	W	231Ph	
44s	Electricity Laboratory ..... (1 cred.; prereq., 4, 43, or registration in 43)	VI-VII	Th	231Ph	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..				
	Sec. a*	I-III	TTh	310MH	Mr. McClendon
	b*	I-III	FS	310MH	Mr. Pettibone
	c	VI-VIII	TTh	310MH	Mr. Gregory

* Sections a and b are for medical students.

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	Mr. Hathaway
	2	IX	F	305E	
3f,w,s	Personal Hygiene and Elementary Sanitation ..... (2 cred.; no prereq.)	IV	TS	101B MH	Mr. Lees
50f,w,su	Public and Personal Health..... (3 cred.; prereq., Zool. 1, 2, and Psy. 1, 2)	V	MWF	101B MH	Mr. O'Brien

The Bulletin *of the* University *of* Minnesota

The College of Education

Part I

Announcement of Courses for the Years 1928-1930

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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
Alfred Brandt, Master Sergeant, Infantry, Instructor in Military Science and Tactics
Carlotta M. Brown, Instructor in Millinery
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 Zoology
Irene Clayton, B.S., Instructor in Physical Education for Women
Mary Starr Conger, Instructor in Physical Education for Women
John Coop, Sergeant, Infantry, Instructor in Military Science and Tactics
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
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
Hally J. Fisher, R.N., Instructor in Preventive Medicine and Public Health
Margaret Gable, M.A., Instructor in Rhetoric
Dorothy P. 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.A., 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
H. Orin Halvorson, B.S., Ch.E., Instructor in Bacteriology
Wheeler Hawley, M.A., Instructor in Romance Languages
Donald C. Heath, B.S. (Arch.), Instructor in Architecture
F. Lincoln D. Holmes, M.A., Instructor in Public Speaking
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
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.A., M.D., Instructor in Physiology
Agnes Kolshorn, M.A., Instructor in Home Economics
Richard L. Kozelka, M.A., Instructor in Economics
Pauline Lane, B.A., Instructor in Physical Education for Women
Faith Leonard, B.S., Instructor in Secretarial Studies
Richard Lindenhahn, Instructor in French Horn
Winslow H. Loveland, M.A., Instructor in English
Reuel I. Lund, C.P.A., M.A., Instructor in Accounting
Margaret E. Macgregor, M.A., Instructor in English
J. Lewis Maynard, B.A., Instructor in Chemistry
Robert E. Maxwell, M.A., Instructor in Economics
John H. Moffett, M.E., Instructor in Mechanical Engineering
Ethel M. Mygrant, M.S., Instructor in Botany
Elizabeth Nissen, M.A., Instructor in Romance Languages
Ada M. Olsen, Instructor in Nursing
Fern Osbeck, B.S., Instructor in Home Economics
J. Henry Owens, M.A., Instructor in Romance Languages
Helen Chelsey Peck, R.N., Instructor in Public Health Nursing
Dayton A. Rogers, Instructor in Machine Shop Practice
W. Martin Sandstrom, Ph.D., Instructor in Agricultural Biochemistry
Karl Scheurer, Instructor in Music
I. Irene Sell, M.S., Instructor in Home Economics
Miles Sery, Instructor in Tuba and Cornet
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
Clyde W. Stephens, Instructor in Piano
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
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
Robert M. Weidenhammer, Ph.D., Instructor in Economics
Isabel White, R.N., B.S., Instructor in Nursing
Henry J. Williams, Instructor in Harp
David H. Willson, Ph.D., Instructor in History
Vernon Young, Instructor in Botany
Nina L. Youngs, B.A., Instructor in Economics

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 Men
Industrial Education	Physical Education for Women
Nursing Education	Public School Music
Occupational Therapy	School Health Work

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 unclassed 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 unclassed 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.

Special fees.—All special methods and practice teaching courses carry a fee of $1 per credit hour.

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, 206 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 which shall include Ed. Psy. 55 and Ed. Psy. 60 or the equivalent. 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 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.

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 a 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 18.

Graduation with high distinction.—All graduates of this college who have attained *special excellence* in scholarship as is evidenced by an honor point ratio[1] of 2.5 or more are candidates for the degree of bachelor of science *with high distinction.* The final authority for making this award rests with the faculty.

Graduation with distinction.—All graduates of this college who have attained *excellence* in scholarship to the extent of having earned an average honor point ratio[1] of 2.0 or more are candidates for the degree of bachelor of science *with distinction.* The final authority for making this award rests with the faculty.

[1] The honor point ratio is calculated by dividing the total number of honor points earned by the total number of credits earned.

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) 1½ 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 1½ 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
Art Education
Botany
Chemistry
Clinical Psychology
Commercial Education
Educational and Vocational Guidance
Educational Psychology
Elementary Education
Elementary School Supervision
English
French
Geography
German
History
Home Economics
Industrial Education
Latin
Mathematics
Natural Science
Norwegian
Nursing Education
Nursery School or Kindergarten Education
Occupational Therapy
Physical Education for Men
Physical Education for Women
Physics
Political Science
Public School Administration
Public School Music
School Health Work
Social Studies
Spanish
Swedish
Teaching Subnormal Children
Teacher Training in Elementary Education
Zoology

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

In order to receive the Bachelor's degree and the university teacher's certificate in secondary subjects, students not completing a specialized curriculum as set forth in this bulletin will be required to pursue in addi-

tion to one academic major and one academic minor the following professional courses.

Subject	Title	Credits
Ed.Psy. 55	Educational Psychology	3
Ed.T. 15	Technique of High School Instruction	3
Ed.Ad. 65	The High School	3

In addition the student must complete a *Special Methods and Practice Teaching Course* (9 credits) in his major field and a course in Special Methods in his minor field (3 credits).

Graduates of normal schools cannot take for credit Psychology 1 or 2.

To complete the professional requirements of 26 quarter credits required for this degree and teacher's certificate the candidate will elect additional credits, under faculty advisement, from among the following subjects:

H.Ed. 1	History of Education
H.Ed. 3	Educational Sociology
H.Ed. 5	Public Education in United States
H.Ed. 101	Foundation of Modern Education
H.Ed. 102	History of Modern Secondary and Higher Education
H.Ed. 103	History of Modern Elementary Education
Ed.Ad. 113	High School Curriculum
Ed.Ad. 121	Educational Advising of Women and Girls
Ed. Ad. 124	Educational Administration
Ed.Ad. 133	Guidance in Secondary Schools
Ed.Ad. 167	Junior High School
Ed.Ad. 169	Extra-curricular Activities
Art.Ed. 89	Application of Esthetic Theory to Art Education
Ind.Ed. 105	Industrial Education
H.E.Ed. 143	Home Economics Curricula
Ed.T. 110	Educational Diagnosis in Secondary Education
Ed.T. 193	Foundations of Secondary School Methods
Ed.Psy. 134	Mental Tests
Ed.Psy. 146	Child Guidance
Ed.Psy. 157	Psychology of Child Development
Ed.Psy. 159	Psychology of Personality

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	Ella J. Rose
Industrial Education	Homer J. Smith
Physical Education for Men	L. F. Keller
Physical Education for Women	J. Anna Norris
Public School Music	Carlyle Scott, A. Pepinsky
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 teachers' 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

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 makng such substitutions or modifications as their 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[1] 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.

[1] See departmental course outlined for minor requirements.

CURRICULA IN ADMINISTRATION OR SUPERVISION

A. GENERAL JUNIOR COLLEGE CURRICULUM

For All Students Anticipating a University Certificate in Administration or Supervision

Freshman Year

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

Sophomore Year

Fall	Credits	Winter	Credits	Spring	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

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	Credits	Winter	Credits	Spring	Credits
Ed.Psy. 55, Ed.Psy.	3	Ed.T. 15, Tech. of H.S. Instruc.	3	Ed.Ad. 75, The Elementary School	3
Ed. Psy. 60, Statis. Meth.	2	Electives[3]	12	Ed.Ad. 65a, The H.S.	3
Electives[3]	10			Electives[3]	9
	15		15		15

[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.

[3] Selection under guidance from the following additional courses is recommended: Ind. Ed. 105; 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; Ed. Ad. 158, Organization for Supervision 3; H. Ed. 3, Educational Sociology; H. Ed. 103, History of Education.

Senior Year

Fall	Credits	Winter	Credits	Spring	Credits
Spec. Meth. and Pract. Teach.	3	Spec. Meth. and Pract. Teach.	3	Spec. Meth. and Pract. Teach.	3
Ed.Ad. 124, Ed. Admin.	3	Ed.Ad. 125, Ed. Admin.	3	Ed.Ad. 156, Prac. Sup.	3
Ed.Psy. 134, Men. Tests	2	Electives[1]	9	Ed.Ad. 123. H.S. Sup.	3
Ed.Ad. 150, Supervision	2			Electives[1]	6
Electives[1]	5				
	15		15		15

II. Three-Year Curriculum for High School Principals

Major Adviser: L. V. Koos

Junior Year

Fall	Credits	Winter	Credits	Spring	Credits
Ed.Psy. 55, Ed.Psy.	3	Ed. 102, Hist. of Mod. Sec. and Higher Ed.	3	Ed.T. 15, Tech. of Teach.	3
Ed.Psy. 60, El. Statis. Meth.	2	Electives[1]	12	Ed.Ad. 65a, The High School	3
Electives[1]	10			Ed.Ad. 75, The Elementary School	3
				Electives[1]	6
	15		15		15

Senior Year

Spec. Meth. and Pract. Teach.	3	Spec. Meth. and Pract. Teach.	3	Spec. Meth. and Pract. Teach.	3
Ed.Ad. 124, Ed. Admin.	3	Ind.Ed. 105, Industrial Ed.	3	Ed.Psy. 111, Ed. Meas.	3
Ed.Psy. 134, Men. Tests and Men. Diag.	2	Ed.Ad. 113, High Sch. Curriculum	3	Ed.Ad. 123, Supvr. of H. S. Instr.	3
Ed.Ad. 150, Supervision.	2	Ed.Ad. 134, Guidance	2	Electives[1]	6
Ed.Ad. 133, Guidance	2	Electives[1]	4		
Electives[1]	3				
	15		15		15

III. Three-Year Curriculum for Elementary School Supervisors

The completion of the first two years of this curriculum entitles one to a certificate for teaching in the elementary and not in the high school.

Major Adviser: Leo J. Brueckner

Required Courses

		Credits
Ed.Psy. 56	Educational Psychology	3
Ed.Psy. 60	Introduction to Statistical Methods	3
Ed.Psy. 111	Educational Measurements in the Elementary School	3
Ed.Psy. 134	Mental Tests	2
Ed.Ad. 75	The Elementary School	2
Ed.Ad. 119	Elementary School Curriculum	3
Ed.Ad. 124	Public School Administration	3
Ed.Ad. 125	Techniques in Administration	3
Ed.Ad. 150	Supervision and the Improvement of Teaching	2
Ed.Ad. 151	Uses of Tests in Improving Instruction	2
Ed.Ad. 156	Practice Supervision	3
	Elective in Supervision	2
Ed.T. 181	Technique of Elementary Instruction	3
	Total	34

[1] See page 21, footnote 3.

Ten hours of electives from courses listed below

	Course	Credits
H.Ed. 3	Educational Sociology	3
H.Ed. 103	History of Modern Elementary Education	3
Ed.T. 23	Teachers Course in Geography	3
Ed.T. 45	Teaching of Geography and History in the Elementary School	2
Ed.T. 143	Teaching of Reading in Elementary School	3
Ed. Ad. 152	Supervision—Adjustment of Schools to Individual Differences	3
Ed.Ad. 153	The Supervision of English	2
Ed.Ad. 154	The Supervision of Social Studies	2
Ed.Ad. 155	The Supervision of Arithmetic	2
Ed.Ad. 157	Practice in Supervision	3
Ed.Ad. 158	Organization for Supervision	2
Ed.Ad. 168	The Junior High School	2
	Special methods courses in elementary and junior high school teaching.	
	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, art, music or physical education	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.

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.

NOTE.—The Agricultural Education faculty recommends that students preparing to teach choose their electives from the elective courses in agricultural education or from such of the following recommended electives as will best complete a well-balanced preparation in subject-matter.

Agricultural Engineering 12, Farm Machinery
Agronomy 122, Special Crops
132, Farm Crops Plant Breeding
133, Judging and Grading Grain and Hay
Forestry 27, Farm Wood Lot and Windbreaks
Plant Pathology 9, Weeds and Seed Testing
Poultry 1 (or equivalent)
Publications and Rural Journalism 19, Publicity

JUNIOR YEAR	SENIOR YEAR
Fall Quarter	
Agr. Ed. 21f, Vocational Education, 3	Agr. Econ. 40f,s, Principles of Marketing Organization, 3 (Agr. Econ. 2)
Agron. 121f, Cereal Crops, 3 (Agron. 1, Bot. 9 cred.)	Agr. Ed. 181f, Teaching Agriculture, 5 (See Part II.)
An. Husb. 2f. Types and Breeds of Livestock, 3 (An. Husb. 1)	Agron. 102f,w, Farm Management Organization, 3 (Agron. 1, Agr. Econ. 2, Soils 4)
Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)	Dy. Husb. 6f, Judging Dairy Cattle, 1 (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, 0 or 3	
Winter Quarter	
Agron. 131f,w, Principles of Genetics, 3 (Bot. or Zool. 9 cred.)	Agr. Ed. 182w, Teaching Agriculture, 5 (See Part II.)
An. Husb. 3w, Types and Breeds of Livestock, 3 (An. Husb. 2)	Agron. 103w,s, Farm Management Operation, 3 (Agron. 102)
Ent. 3f,w, Economic Entomology, 3 (Zool. 16)	Sociol. 14f,w,s, Rural Sociology, 3
Vet. 9w, Veterinary Studies	Electives, 6
Electives, 5	

Spring Quarter

Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
Agr. Eng. 40f,s, Mechanical Training I, 3
Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1, Bot. 9 cred.)
An. Husb. 8s, Fundamentals of Breeding and Management, 5
Vet. 10s, Veterinary Studies, 3 (Vet. 9)
Agr. Ed. 42f,w,s, Supervised Teaching Experience, 3 (See Part II.)
Agr. Ed. 183s, Teaching Agriculture, 5 (See Part II.)
Electives, 9

ART EDUCATION

A FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

Major Adviser: Ruth Raymond

The following special curriculum leads to the degree B.S., with a state teacher's certificate in art education. Positions open to graduates are largely departmental in elementary schools, and in junior and senior high schools. Teachers with experience in other subjects and with talent and taste for art are especially recommended to qualify for art supervision. A minor is provided with especial reference to graduates of state teachers colleges who have taste in art and some teaching experience, that they may meet our state's need for teachers of art in combination with other elementary or high school subjects. For the statement of requirements in this art minor see below.

Students preparing for the university degree with a teacher's certificate in art may register in the Department of Art Education at the beginning of their freshman year.

Requirements

1. In Art, the following is the minimal requirement for the art major:
   18 credits in design
   18 credits in drawing
   12 credits in handicrafts[1]
   5 credits in art history and appreciation[2]
   3 credits in theory of art teaching
   9 credits in practice teaching and special methods in art.
2. In professional education courses:
   3 credits in Educational Psychology, Ed. Psy. 55 or 56.
   3 credits in Technique of High School Instruction, Ed.T. 15
   and 12 credits selected from the following courses:
   The Elementary School, Ed.Ad. 75
   Educational Sociology, H.Ed. 3
   History of Modern Elementary Education, H.Ed. 103
   Brief Course in History of Education, H.Ed. 1
   The High School, Ed.Ad. 65
   Introduction to Statistical Methods, Ed. Psy. 60
   Organization of Supervision, Ed.Ad. 181
3. A minor group: a minimum of 18 credits, chosen, in accordance with the individual student's interest and ability, from any one of the departments offering courses through the College of Education bulletin.

[1] Course 11 in Industrial Education may be chosen as a handicraft.

[2] These credits may be chosen from the following courses: Art Ed. 55, 56, 57, 70, 153, 154; Art Hist. and Int. 1, 2; H.E. 161; Gr. 42, 43, 44, 45.

4. Required supporting courses: a minimum of
   9 credits in English composition
   6 credits in English literature
   10 credits in history, if a minor of high school history has not been presented for entrance
   10 credits in a natural science, if a minor of a laboratory science has not been presented for entrance
   (Orientation will meet this requirement)
   6 credits in general psychology
   5 credits in sociology
   3 credits in textiles

5. Electives. Recommended electives: continuation of a language begun in high school (French especially recommended); speech arts, for use in teaching, and to lead to the play production courses; courses in philosophy, history, sociology, and psychology; courses for the appreciation of music, literary classics, and the stage, (attendance upon concerts, exhibitions, and plays is urged as part of an art education). A large number of the 40 electives profitably may be spent for art courses beyond the minimal requirement listed above.

Art minor:
   9 credits in design
   9 credits in drawing
   6 credits in handicrafts
   3 credits in art history and appreciation
   3 credits in special methods and practice teaching.

COMMERCIAL EDUCATION

Major Advisers, R. A. Stevenson, Ellen Davidson

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, to be approved by the adviser, is required.

Junior College

1. 9 credits in English (Composition 4-5-6).
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. 3 credits in Elements of Accounting (Econ. 20).*
8. 6 credits in Principles of Accounting (Economics 25-26).
9. 5 credits in Elements of Statistics (Economics 14).
10. 26 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	Credits	Winter	Credits	Spring	Credits
Econ. 51, Business Law.	3	Ed.Psy. 55, Educational Psychology	3	Ed.T. 15, Technique of Teaching	3
Electives	12	Econ. 52, Business Law.	3	Ed.Ad. 65, The High School	3
		Electives	9	Econ. 53, Business Law.	3
				B.A. 139, Advanced General Accounting	3
				Electives	3 to 5

Senior Year

Fall	Credits	Winter	Credits	Spring	Credits
Ed.T.80, Teachers' 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. 102, Trade Routes and Trade Centers	3
Econ. 161, Labor Problems	3	Electives	8 to 11	B.A. 86, Office Management	3
Electives	3 to 6			Econ. 85, Economics of Marketing	3
				Electives	3 to 5

Recommended Electives

	Credits
History of Education (H.Ed. 1)	5
Educational Sociology (H.Ed. 3)	3
Secretarial Training { Shorthand (Econ. 30-31, 40)	13
Secretarial Training { Typewriting (Econ. 32-33)	2
Advertising (Psychology 56 and B.A. 88)	6
Industrial History (History 80-81)	6
Personnel Management (B.A. 167)	3
Additional English Composition	6
The Modern Corporation (Economics 160)	3
Survey of Cost Accounting (B.A. 130)	3
Economics of Transportation (Economics 172)	3

*Students who have had a high school course or experience in bookkeeping may be exempt from this course and admitted to Economics 25 by passing a placement test.

EDUCATIONAL PSYCHOLOGY

UNDERGRADUATE CURRICULA IN EDUCATIONAL PSYCHOLOGY, CLINICAL PSYCHOLOGY, AND EDUCATIONAL AND VOCATIONAL GUIDANCE

Students who are planning on assuming certain specialized duties in connection with their high school teaching or who are interested in securing a basis for graduate work may elect an undergraduate major or minor in the above fields.

These curricula are intended particularly for students who may perform the duties of counselor, dean, clinical psychologist, or specialist in tests and measurements in connection with teaching duties in the high school. It is not their purpose to produce a person with highly specialized training in those fields, but to supply a basis for later professional growth as well as some immediate background for handling the problems involved in the several positions indicated. Students with a real interest in these fields are advised to procure training on the graduate level.

Three general programs have been set up. The first constitutes a major or minor in general educational psychology; the second is a major in clinical educational psychology; and the third is a major or minor in educational and vocational guidance. It is expected that students who secure a major in these curricula will also secure two teaching minors in meeting the requirements for the university teacher's certificate. If the curricula are elected as minors, it is expected that the student will secure a major in an academic subject in order to meet the requirements for the certificate.

Permission of the adviser must be secured to elect one of these curricula.

I. Undergraduate Curriculum in Educational Psychology

Major Advisers: W. S. Miller, Willard C. Olson

For a Major

	Course	Credits
Psy. 1-2	General Psychology	6
Psy. 4-5	Introductory Laboratory Psychology	4
Ed.Psy. 55	Educational Psychology	3
Ed.Psy. 60	Introduction to Statistical Methods	3
Ed.Psy. 134	Mental Tests	2
Ed.Psy. 157	Psychology of Child Development	
	or	
Ed.Psy. 158	Psychology of Adolescence	3
Ed.Psy. 159	Psychology of Personality	2
	Electives in Educational Psychology	7
	Total	30

For a Minor

Psy. 1-2	General Psychology	6
Psy. 4-5	Introductory Laboratory Psychology	4
Ed.Psy. 55	Educational Psychology	3
Ed.Psy. 60	Introduction to Statistical Methods	3
Ed.Psy. 134	Mental Tests	2
Ed.Psy. 157	Psychology of Child Development, or	
Ed.Psy. 158	Psychology of Adolescence	3
	Total	21

In addition to the above major or minor requirements students will take Ed.Ad. 65, The High School, 3 credits; Ed. 15, Technique of High School Instruction, 3 credits; and practice teaching and special methods, 9 credits.

II. Clinical Psychology

Major Adviser: John G. Rockwell

The following courses are considered basic for the training of the clinical psychologist. The student should plan on pursuing training for an advanced degree. He may secure an undergraduate major by electing a total of 45 credits from the courses listed below.

	Course	Credits
Psy. 1-2	General Psychology	6
Psy. 4-5	Introd. Lab. Psychology	4
Psy. 144-145	Abnormal Psychology	6
Soc. 1	Introduction to Sociology	5
Soc. 51	Occurrence of the Socially Inadequate	3
Soc. 52	Elementary Case Work	3
Soc. 53	Elements of Criminology	3
Soc. 60	Child Welfare	3
Soc. 90-91-92	Elementary Field Training	6
Ed.Psy. 55	Educational Psychology	3
Ed.Psy. 116 or 60	Statistical Methods	3
Ed.Psy. 134	Mental Tests	2
Ed.Psy. 143-144	Individual Mental Examination	4
Ed.Psy. 146	Child Guidance	4
Ed.Psy. 149-150-151	Psycho-Educational Clinic	6
Ed.Psy. 184	Mental Deficiency	2

In addition to the above, major students will take Ed.Ad. 65, The High School; Ed. 15, Technique of High School Instruction, 3 credits; and practice teaching and special methods, 9 credits.

III. Educational and Vocational Guidance

Major Advisers: M. E. Haggerty, Helen D. Bragdon, Grayson N. Kefauver

For a Major

	Course	Credits
Psy. 1-2	General Psychology	6
Psy. 4-5	Introd. Lab. Psychology	4
Ed.Psy. 55	Educational Psychology	3
Ed.Psy. 60	Introduction to Statistical Methods	3
Ed.Psy. 134	Mental Tests	2
Ed.Psy. 187	Practice in Personnel Work	2
Ed.Ad. 65	The High School	3
Ed.Ad. 169	Extra-curricular Activities	2
Soc. 1	Introduction to Sociology	5
Soc. 51	Occurrence of the Socially Inadequate	3
Soc. 52	Elementary Case Work	3
Soc. 90	Elementary Field Training in Case Work	2
Ed.Ad. 133	Guidance in Secondary Schools, or	
Ind.Ed. 110	Guidance in the Schools, or	
Ed.Ad. 121	Educational Advising of Women and Girls	2 or 3
	Electives	5
	Total	45 or 46

For a Minor

	Course	Credits
Psy. 1-2	General Psychology	6
Psy. 4-5	Introd. Lab. Psychology	4
Ed.Psy. 55	Educational Psychology	3
Ed.Psy. 60	Introduction to Statistical Methods	3
Ed.Psy. 134	Mental Tests	2
Soc. 1	Occurrence of the Socially Inadequate	
Soc. 51	Introduction to Sociology	5
Ed.Ad. 65	The High School	3
Ed.Ad. 133	Guidance in Secondary Schools, or	
Ind.Ed. 110	Guidance in the Schools, or	
Ed.Ad. 121	Educational Advising of Women and Girls	2 or 3
	Total	28 or 29

In addition to the above major or minor requirements students will take Ed. 15, Technique of High School Instruction, 3 credits; and practice teaching and special methods, 9 credits.

ELEMENTARY EDUCATION

PRESCRIBED CURRICULUM FOR THE UNIVERSITY CERTIFICATE FOR ELEMENTARY SCHOOL TEACHERS

Major Adviser: L. J. Brueckner

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	Credits
Ed.Psy. 56	Educational Psychology	3
Ed.Psy. 60	Educational Statistics	2
Ed.Psy. 111	Educational Measurements in the Elementary School	3
Ed.Ad. 75	The Elementary School	3
Ed.Ad. 119-120	Elementary School Curriculum	4
Ed.Ad. 124	Educational Administration	3
Ed.Ad. 150	Elementary School Supervision	3
Ed.T. 143	The Teaching of Reading in the Elementary School	2
Ed.T. 181	Technique of Elementary Instruction	3

Thirteen hours to be elected from courses listed below

Ed.Ad. 152	Supervision—The Adjustment of Schools to Individual Differences	3
Ed.Ad. 153	Supervision of English in the Elementary Schools	3
Ed.Ad. 155	Supervision of Arithmetic in the Elementary Schools	3
Ed.Ad. 167	The Junior High School	3
Ed.Soc. 3	Educational Sociology	3
Hist.Ed. 103	History of Modern Elementary Education	3
Ed.T. 23	The Teaching of Geography	3
Ed.T. 44	Children's Literature	3
Ed.T. 45	Teaching of History and Geography	2
Ed.Psy. 134	Mental Tests	2
Ed.Psy. 159	Psychology of Personality	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, art, music, physical education	36
	General electives	18
	Total credits required for certificate	90

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 five lines of specialization described below. When a student has acquired 90 credits and 90 honor points and indicates her specialization as the teachers' or the extension course she becomes also a registrant in the College of Education.

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,w,s, Child Training, 3 (Psy. 1-2)

Hist. of Ed. 1f,w,s, Brief Course in the Hist. of Ed., 5 (6 cred. in Psy.) or Hist. of Ed. 5s, Public Ed. in U. S., 3 (Psy. 1-2) or Hist. of Ed. 101f, Foundations of Modern Ed., 3 (6 cred. in Psy. and 6 cred. in Hist.) or Ed. Ad. 65f,w,s, The High School, 3 (Ed. 55)

H. E. Ed. 42f,s, Special Methods of Teaching Home Economics, 3 (H. E. 13, 83, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55)

H. E. Ed. 143f,w,s, Home Economics Curricula, 2 (H. E. Ed. 42 or parallel)

Senior Year

H. E. Ed. 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: Clothing Planning and Construction A and B, Textiles, Foods and Cookery, Food Management, Color and Design I and II, and Advanced Design.

C. Home practice in foods and cookery following Courses H. E. 80 and 83 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 REQUIREMENTS

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. 83f,w,s, Food Management, 3 (H. E. 80)
H. E. 85f,w,s, Food Marketing, 2 (Agr. Econ. 1 or parallel)
H. E. 131f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 53)
H. E. Ed. 40f,w,s, Child Training, 3 (Psy. 1-2)
Physiol. 4f.w,s, Human Physiology, 4 (Chem. 4 cred., Zool. 3 cred.)
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 1, 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 32-35.

3. *Electives.*—Enough electives should be selected to make from 15 to 17 credit hours each quarter.

Senior Year

1. *General courses.*—The following courses may be registered for any quarter that they are offered except that the proper sequence of continuation courses and prerequisites must be observed.

H. E. 34f,w, Home Management: Operation and Maintenance, Lectures, 3 (H. E. 35 parallel, 83, Agr. Econ. 1 or parallel, Prev. Med. 52)
H. E. 35f,w,s,[1] Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 83, H. E. Ed. 40, or parallel, Prev. Med. 52, home practice in foods and cookery; must parallel H. E. 34)
H. E. 170f,w,s, Nutrition of the Family, 3 (Agr. Biochem. 4, H. E. 80 or 81)
H. E. 171f,w,s, Child Nutrition, 3 (H. E. 170 or parallel, H. E. Ed. 40)

2. *Special courses* as prescribed by the curriculum of the line of specialization selected. See special requirements on pages 32-35.

3. *Electives.*—Enough electives should be selected to make, with those listed above, from 15 to 17 credit hours each quarter.

TEACHERS' CURRICULUM IN GENERAL HOME ECONOMICS

To those courses listed under Requirements for the University Teacher's Certificate in Home Economics and General Requirements add the following:

a. *Required courses.*

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3

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

H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51 home practice in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53)
or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)

b. *Elective courses.*—Five to ten credits must be elected from Group A and enough credits from Group B to make a total of sixteen credits.

Group A
Hist. 1-2 or 2-3
Pol. Sci. 1
Group B
Bot. 1
Child Wel. 60
Eng. 31-32 or 33, 73-74
H. E. 55, 57, 61, 182, 195, 154, 73 or 75 or 179 or 173
H. E. Ed. 142
Jour. 13, 41, 65, 69
Lib. Methods 1
Psy. 3, 56 or 60
Rhet. 28, 32, 33, 34
Zool. 183

TEACHERS' CURRICULUM IN HOME ECONOMICS EXTENSION

To those courses listed under Requirements for the University Teacher's Certificate in Home Economics and General Requirements add the following:

a. *Required courses.*

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home practice in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53)
or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 44w, Home Economics Extension Work, 3 (H. E. Ed. 42, 49 or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)

b. *Elective courses.*—Ten credits must be elected from the following courses:

Agr. Ed. 75
Agr. Eng. 34
Child Wel. 60
Agr. Econ. 25
H. E. 57, 61, 75, 173, 179, 182, 195
Jour. 13, 41, 65, 69
Psy. 56
Rhet. 24
Soc. 110

TEACHERS' CURRICULUM IN FOODS AND NUTRITION

To those courses listed under Requirements for the University Teacher's Certificate in Home Economics and General Requirements add the following:

a. *Required courses.*

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
H. E. 73f,s, Nutrition I, 4 (Agr. Biochem. 4, H. E. 80 or 81, Physiol. 4)
H. E. 173s, Nutrition in Disease, 3 (H. E. 170, 175)
or
H. E. 175f,w, Nutrition II, 4 (H. E. 73)
or
H. E. 75f, Dietetics Laboratory, 2 (H. E. 182 or equivalent)
and
H. E. 179w,s, Readings in Nutrition, 2 (H. E. 170)
H. E. 182f,w,s, Experimental Cookery, 3 (H. E. 80)
or
H. E. 183f,w,s, Experimental Cookery, 5 (H. E. 80)
H. E. 186f,s, Special Food Problems, 3 (H. E. 182)
or
H. E. 187f,s, Special Food Problems, 5 (H. E. 182, Agr. Biochem. 2)

b. *Elective courses.*—Fifteen additional credits must be elected from the following courses:

Agr. Biochem. 2, 106, 108
Agr. Eng. 34, 35
Chem. 110
Eng. 31-32 or 33, 73-74
French 1, 2, 3, 8, 9, 10
German 1, 2, 3, 4, 24, 25, 26, 27, 28, 29
Hist. 1-2 or 2-3
H. E. 11, 13, 17, 18, 60, 61, 63, 65, 136, 150, 163
Jour. 13, 41, 65, 69
Lib. Meth. 1
Math. 3, 4, 5, 6, 7
Phys. 3, 4, 23, 24, 43, 44
Pol. Sci. 1
Rhet. 28, 32, 33, 34

TEACHERS' CURRICULUM IN TEXTILES AND CLOTHING

To those courses listed under Requirements for the University Teacher's Certificate in Home Economics and General Requirements add the following:

a. *Required courses.*

Agr. Econ. 126s, Economics of Consumption, 3 (Agr. Econ. 1)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11, or equivalent, 51, home practice in garment making)
H. E. 17w,s, Advanced Clothing, 3 (H. E. 13, 53)
or
H. E. 18f,s, Commercial Clothing Manufacture, 3 (H. E. 13, 53)
H. E. 102f,s, Advanced Textiles, 3 (H. E. 3, Agr. Biochem. 3-4, Agr. Econ. 1 or parallel)
H. E. 115f,w, Clothing Economics, 2 (H. E. 13, Agr. Econ. 1)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)

b. *Elective courses.*—Eleven additional credits must be added from the following courses:

Agr. Biochem. 2
Bot. 8
H. E. 17 or 18, 55, 57, 107, 154, 195

TEACHERS' CURRICULUM IN RELATED ART

To those courses listed under Requirements for the University Teacher's Certificate in Home Economics and General Requirements add the following:

a. *Required courses.*

H. E. Ed. 147w, Organization and Methods for Related Art Teaching, 3 (H. E. Ed. 42 or parallel, H. E. 53, 131 or parallel) (Omit H. E. Ed. 143 as listed under requirements for university teacher's certificate)
Art Ed. 4f-5w-6s, Still Life, 3
Art Ed. 7f-8w-9s, Sketch, 3
Art. Ed. 29f-30w-31s, Sketch, Course II, 3 (Art Ed. 7, 8, 9)
H. E. 11f,w,s, Clothing Planning and Construction, A, 3
H. E. 13f,w,s, Clothing Planning and Construction, B, 3 (H. E. 3, 11 or equivalent, 51, home practice in garment making)
H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 53 or parallel)
H. E. 57s, Batik and Other Crafts, 3 (H. E. 3, 53, or parallel)
H. E. 150f,w,s, Art History and Appreciation, 3 (H. E. 51 or equivalent)
H. E. 152w, Advanced Interior Design, 3 (H. E. 53, 131, 150)
H. E. 154s, Advanced Costume Design, 3 (H. E. 13, 53, 55 recommended)

b. *Elective courses.*—Electives should be chosen following consultation with adviser.

INDUSTRIAL EDUCATION[1]

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

Major Adviser: Homer J. Smith

Freshman Year

Fall	Credits	Winter	Credits	Spring	Credits
Eng. Af Fresh. Eng.	5	Eng. Bw Fresh. Eng.	5	Eng. Cs Fresh. Eng.	5
Ind. 40f, Analysis	2	Ind. 42w, Course Organization (prereq., 40f)	2	Ind. 25s, Lit. of Ind. Ed.	2
Ind. 20f, Ind. Hist.	2	Shopwork	3	Shopwork	2
Shopwork	4	Drawing	3	Drawing	3
Drawing	2	Electives	2	Electives	3

Sophomore Year

Fall	Credits	Winter	Credits	Spring	Credits
Econ. 6f, Prin. of Econ.	5	Econ. 7w, 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. (prereq., 6 cred. in psy.)	3
Ind. 60f, Soc. Agencies in Ed.	2	Ind. 61w, Soc. Sig. of Voc. Ed. (prereq., 60)	2	Drawing	2
Shopwork	3	Shopwork	3	Electives	5
Electives	2	Electives	2		

[1] Part II of the College of Education bulletin lists some courses of this department which are not parts of this curriculum. Examples, Ind. 10 and Ind. 105.

Junior Year

Fall	Credits	Winter	Credits	Spring	Credits
Ind. 80f, Gen. Ind. Tr. (prereq., 10 cred. in ed.)	2	Ed. 3w, Ed. Soc. (prereq., Soc. 1)	3	Ind. 14s, Methods in Drawing (10 cred. in draw)	2
124f, Ed. Admin. (prereq. 10 cred. in ed.)	3	Ind. 70w, Methods in Shop Subjects (prereq., 15)	2	Ind. 66s, Methods in Rel. Subj. (prereq., 40)	2
15f, Technique of Teaching (prereq., Ed. 55)	3	Ind. 30w, Graphic Presentation	2	Ed. 103s, Hist. of Elem. Ed.	3
Electives	7	167w, Junior High School (prereq., 10 cred. in ed. including Ed. 55)	2	168s, Junior High School	2
		Electives	6	Electives	6

Senior Year

Fall	Credits	Winter	Credits	Spring	Credits
Ind. 50f. Prac. Teach.	2	Ind. 51w, Prac. Teach.	2	Ind. 52s, Prac. Teach.	2
Ind. 170f, Admin. of Voc. Ed. (Day School)	2	Ind. 171w, Admin. of Voc. Ed. (Evening School)	2	Ind. 172s, Admin. of Voc. Ed. (Part Time Schools)	2
134f, Mental Tests (prereq., Ed. 55)	2	Ind. 110w, Guidance in the Schools (prereq., 134)	2	Psy. 130s, Voc. Psy. (6 cred. in psy.)	2
Electives	9	Electives	9	Electives	9

Required, as specified, 120 quarter credits. Advised electives, 60 quarter credits. Total 180 quarter credits.

Mathematics, science, art, and athletic coaching are appropriate elective fields. The requirement of 15 credits in shopwork and 10 in drawing (25 total) may be extended by election to a maximum of 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.

Certain required courses of the curriculum and others acceptable as electives may be taken by correspondence and by extension lecture courses.

Those desiring evaluation of credits earned in other institutions, since high school graduation, should procure signed transcripts of such credit and mail them to the Department of Industrial Education, 218 Old Library Bldg.

NATURAL SCIENCE

Advisers: H. A. Erikson, A. W. Hurd

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 desiring 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, zoology, physics. (On account of mathematics requirements, students majoring in physics may satisfy the requirement by offering but 25 hours.) In the statement 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, geology, zoology. 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

Fall	Credits	Winter	Credits	Spring	Credits
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

Fall	Credits	Winter	Credits	Spring	Credits
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

Fall	Credits	Winter	Credits	Spring	Credits
Major	5	Major	5	Technique of H. S. Inst.	3
Natural science	5	Electives	11	Electives	12
Ed. Psychology 55	3				
Electives	3				

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	Electives	8	Technique of H. S. Inst.	3
Electives	5			Electives	5

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.

FIFTH YEAR SEQUENCES

EDUCATION

No.	Title	Credits
Major:		
Ed.Psy. 190,191,192	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:
Ed.Psy. 190,191,192

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:
Org. Chem. 103-104-105

PHYSICS

No.	Title	Credits
Major:		
Phys. 101-103-105	Theoretical Physics	15
Phys. 124	Pyrometry	3
Phys. 134w	Applied Optics	3
Phys. 144f	Electrical Measurements	3
		24

Minor:
Phys. 122,132,142

ZOOLOGY

No.	Title	Credits
Major:		
Zool. 109-110	General Physiology	10
Zool. 181-182	Embryology	6
Zool. 183	Genetics and Eugenics	3
		19
	Thesis	

Minor:
Zool. 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 COURSE CURRICULUM

First Year[1]

Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
Rhet. 4 or A	3 or 5	Rhet. 5 or B	3 or 5	Rhet. 6 or C	3 or 5
Botany 1	5	Botany 2	5	Anatomy 2	3
Chem. 6, 9, or 1	5 or 4	Chem. 7, 10, or 2	5 or 4	Chem. 3 or elect.	4
Electives		Electives		Electives	
Total	15	Total	15	Total	15

Second Year[1]

Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
Zool. 1	5	Zool. 2	5	Physiol. 4	5
Psy. 1	3	Psy. 2	3	Ed. Psy.	3
Hist.	5	Hist.	5	Bact. 51	5
Rhet. 18 or 12 or Pub. Sp. 41	3	Rhet. 18 or 12 or Pub. Sp. 42	3	Hist. of Nurs.	1
				Theory of Diet	1
				Lettering	1
Total	16	Total	16	Total	16

Third and Fourth Years

Students are registered in the School of Nursing during the third and fourth years, which consist of four quarters each. They are assigned to graded services for practical work and have a schedule of lectures and recitation courses in the associated hospitals.

Fifth Year

Students are registered in the College of Education during the last three quarters. The following curriculum is outlined for the year.

Fall Quarter	Credits	Winter Quarter	Credits	Spring Quarter	Credits
Tech. of Teach.	3	Spec. Methods	5	Prac. Teach.	5
Soc. 1	5	The High School	3	Hosp. Admin.	4
Elect.[2]	8	Hosp. Prac. Teach.	2	Elect.	5
		Elect.	5		
Total	16	Total	15	Total	14

[1] Registration in the first five quarters is in the Junior College. Registration in the spring quarter of the second year is in the School of Nursing.

[2] History of Education 1 and Educational Sociology 3 are suggested electives for this course.

NURSERY SCHOOL AND KINDERGARTEN EDUCATION

Major Adviser: John E. Anderson

The following curriculum is arranged for persons who are preparing to teach or direct nursery schools and for persons who wish to enter the field of kindergarten teaching. Followed by a year of graduate work, it also offers excellent basic preparation for those wishing to enter the field of parental education. Students taking this curriculum should be able to play simple piano music.

This curriculum is offered in co-operation with the Institute of Child Welfare, an organization established in the University for the scientific study of the development of the child. Co-operating with the institute are a number of university departments: Anatomy, Education, Home Economics, Nervous and Mental Diseases, Pediatrics, Psychology, Public Health, and Sociology.

The institute maintains a nursery school and an experimental kindergarten for the observation and study of young children which will, in conjunction with the public schools, be used for observation and practice for students undertaking this curriculum.

FOUR-YEAR NURSERY SCHOOL AND KINDERGARTEN CURRICULUM

Freshman Year

Dept. No.	Title	Credits F	Credits W	Credits S	Prerequisites
Zool. 1-2	General Zoology	5	5	..	None
Comp. 4-5-6	Freshman Composition	3	3	3	None
Hist. 1-2 or Orient. 1-2	Modern World / Orientation	5	5	..	None
Pol. Sci. 1	American Government	..	..	5	None
Geog. 15	Introduction to Human Geography	..	..	5	None
Phys. Ed. 1-2-3	Elem. Phys. Training	0	0	0	None
Electives		2	2	2	
		15	15	15	

Sophomore Year

Dept. No.	Title	Credits F	Credits W	Credits S	Prerequisites
Psy. 1-2	General Psychology	3	3	..	None
Psy. 4-5	Introductory Lab. Psy.	..	..	4	Psy. 1-2
Soc. 1	Introduction to Sociology	5	..	..	None
Soc. 49	Occurrence of the Socially Inadequate	..	..	3	Soc. 1
Art. Ed. 1-2-3	Fundamental Principles of Design	3	3	3	None
Art. Ed. 7-8-9[1]	Sketch	1	1	1	None
Ind. Ed. 11	Special Class Woodwork	..	2	..	None
Speech 41-42	Fundamentals of Speech	3	3	..	Comp. 4-5-6
Phys. Ed. 17-18	Sophomore Games and Folk Dancing	0	0	..	
Phys. Ed.	One other course in Physical Education	..	..	0	
Electives		0	3	4	
		15	15	15	

[1] For Art Ed. 7-8-9, Art Ed. 4-5-6 or Art Ed. 32, 35, 38 may be substituted.

Junior Year

Dept. No.	Title	Credits F	Credits W	Credits S	Prerequisites
Ed Ad.75	The Elementary School....	..	..	3	Ed. Psy. 55 or 56 or equiv.
Phys. Ed. 43-44-45	Theory and Function of Play	½	3	½	6 qtrs. phys. ed.
Prev. Med. 50	Public and Personal Health	3	..	..	Zool. 1-2, Psy. 1-2
Soc. 52	Elementary Case Work.....	3	..	..	Soc. 49
Soc. 90-91	Elementary Field Training in Case Work.....	..	3	3	Soc. 49 and 52
T. 30	Principles of Kindergarten and Nursery School Ed....	..	3	..	6 cred. psy.
T. 31	Permanent Play Materials..	2	..	..	6 cred. psy.
T. 32	Plastic Materials	..	2	..	with T. 30
T. 33	Rhythms, Games, and Music for the Young Child..	..	..	2	T. 30
T. 34	Story Telling for Young Children	..	..	2	T. 30
T. 85-86-87	Methods and Observation...	1	1	1	6 cred. psy.
C.W. 80	Child Psychology	3	..	..	6 cred. psy.
C.W. 90	Physical Development of the Child	2	..	..	Zool. 1-2, Psy. 1-2
Electives	.....	1	3	4	
		15½	15	15½	

Senior Year

Dept. No.	Title	Credits F	Credits W	Credits S	Prerequisites
Ed. Ad. 119	Elementary School Curric...	3	..	..	Ed. Psy. 55 or equiv.
Ed. Psy. 134-135	Mental Tests and Mental Diagnosis	2	2	..	Ed. Psy. 55 or equiv.
Ed. Psy. 146-147	Child Guidance	..	2	2	15 cred. psy. and ed.
C.W. 120	Health Care of Young Child	..	..	2	C.W. 90
H.E. 70	Nutrition Survey	3	..	..	10 cred. lab. science
T. 88-89-90	Practice Teaching in Kingarten or Nursery School	3	3	3	T. 30-34, 85-87
T. 143-144	The Teaching of Reading..	2	2	..	9 cred. ed.
Electives	.....	2	6	8	
		15	15	15	

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

First Year

Fall		Winter		Spring	
English A	5	English B	5	English C	5
Zoology 1	5	Zoology 2	5	Physiologic Chem. 1	7
Prelim. Hygiene	0	Design 2	2	Design 3	2
Fund. Prin. Design 1	2	Sketch 7	1	Sketch 8	1
Basketry 37	2		13		15
	14				

Second Year

Fall		Winter		Spring	
History 1 or 7	5	History 2 or 8	5	Hospital Economics and Relationships 62	2
Psychology 1	3	Psychology 2	3	Anatomy 4	4
Sociology 1	5	Prin. of Harmony in Form and Color 21	2	Application of Design to Fabric 14	2
Principles of Harmony in Form and Color 20	2	Electives	5	Prin. of Harmony in Form and Color 22	2
	15		15	General Physics 23	5
					15

Third Year

Fall		Winter		Spring	
Technique of High School Instruction 15	3	Abnormal Psychology 144	3	Abnormal Psychology 145	3
Sociology 51	3	Sociology 52	3	Principles and Practice of Hospital S.S. 60	3
Pottery 41	2	Cardboard Construction 32	1	Theory of Occupational Therapy S.S. 63	2
Elem. Weaving and Allied Crafts 38	1	Occupational Hygiene and Disease 73 or Tuberculosis 60	2	Application of Design in Needlecraft	2
Educational Psychology 55	3	Public and Personal Health 50	3	Metal Work	2
Elective	3	Preliminary Hospital Practice S.S.66	3	Preliminary Hospital Practice Teaching S.S.67	3
	15		15		15

5 credits in drawing will be required, 3 in the third year—elective as to course.

Summer Quarter

S.S.68-69 Hospital Practice Training 12 weeks—18 credits
(Full time in an institution)

Fourth Year[1]

Fall		Winter		Spring	
Kinesiology 80	3	Child Health Ed. 80	3	Hospital Practice Training S.S.72	17
Art History and Appreciation 70	2	Mental Hygiene 61	2		
Woodwork 10	2	Bookbinding 33	2		
Elements of Preventive Medicine 53	3	Social Psychology 140	3		
Preliminary Hospital Practice Training	3	Preliminary Hospital Practice Training S.S.71	6		
Elective	3		16		
	16				

[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.

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 F	Credits W	Credits S	Prerequisite Courses
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. A,B,C	Elementary Physical Education	1	1	1	None
	Approved electives	5	5	3	
		16	16	16	

Sophomore Year

No.	Title	Credits F	Credits W	Credits S	Prerequisite Courses
Zool. 1-2	General Zoology	5	5	..	None
Psy. 1-2	General Psychology	3	3	..	None
Anat. 3	Human Anatomy	..	..	4	Zool. 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	Zool. 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 F	Credits W	Credits S	Prerequisite Courses
Physiol. 58,59	Human Physiology	..	4	4	Zool. 1 qtr., chem. 1 qtr.
Phys. Ed. 19-20-21	Gymnastics	1	1	1	Phys. Ed. A,B,C
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
Ed. Psy. 55	Educational Psychology	..	3	..	Psy. 1-2
Ed. Ad. 65	The High School	..	..	3	Ed. 55
	General electives[1]	7	5	3	
		13	15	15	

Senior Year

No.	Title	Credits F	Credits W	Credits S	Prerequisite Courses
Prev. Med. 80	Educational Hygiene	..	3	..	Prev. Med. 50 or 52 or 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	..	..	3	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, Ed. 55
	General electives[1]	7	3	5	Psy. 1-2
		15	15	15	

[1] H.Ed.1, History of Education and Ed.3, Educational Sociology are suggested electives for this curriculum.

COURSES FOR MEN MINORING IN ATHLETIC COACHING

No.	Title	Credits F	Credits W	Credits S	Prerequisite Courses
Phys. Ed. Af,Bw,Cs	Elementary Physical Education	1	1	1	
Phys. Ed. 10-11-12	Minor Sports	2	2	2	
Phys. Ed. 19-20-21	Gymnastics	1	1	1	Phys. Ed. A,B,C
Phys. Ed. 24	Technique of Gymnastic Teaching	..	..	2	Phys. Ed. A,B,C
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	

NOTE.—All candidates for teacher's certificate with minor recommendation in athletic coaching must take Physical Education 19, 20, 21, 24, 30, and 33. 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); work in this department must be taken for six consecutive quarters except by petition through this department; 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, for which registration is required, except Phys. Ed. 24f,s, $2 a quarter. Maximum fee paid by a student in physical education, $3.50 a quarter.

The special four-year professional course described below is 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, and should possess qualities of personality which will win the co-operation of others.

They 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 F	Credits W	Credits S	Prerequisite Courses
English A-B-C	Freshman English[1]	5	5	5	None
or					
Eng. 4-5-6	Freshman English[1]	3	3	3	None
Chem. 14-15	Gen. Inorg. Chemistry[2]	5	5	..	None
Farm Eng. 23[5]	General Physics[3]	..	..	5	None
Hist. 1-2	Modern World[1]	5	5	..	None
Soc. 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 and Posture Training. Danish Gymnastics, Baseball	0	0	0	None
		16 or 14	15 or 13	15 or 13	

[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] If one year of physics is presented at entrance no physics will be required.

Sophomore Year

No.	Title	Credits F	Credits W	Credits S	Prerequisite Courses
Zool. 1-2[2]	General Zoology[1]	5	5	..	None
Anat. 4s	Human Anatomy[3]	..	..	5	Zool. 1-2
Psy. 1-2[2]	General Psychology	3	3	..	None
*Prev. Med. 2w	First Aid[3]	..	1	..	Zool. 9 cred.
Bact. 51f,w,s	General Bacteriology[1]	..	..	5	Chem. 10 cred., Zool. 10 cred.
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...	½	½	..	Phys. Ed. 49-50
Phys. Ed. 56w-57s	Swim. with Technique.....	..	½	½	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	..	..	
		15½	14	14½	

Junior Year

No.	Title	Credits F	Credits W	Credits S	Prerequisite Courses
Physiol. 58-59	Human Physiology	..	4	4	Zool. 1-2, 10 cred. chemistry
Prev. Med. 2[1]	First Aid[3]	1	..	..	Zool. 10 cred.
Prev. Med. 53	Elements of Preventive Medicine	..	..	3	Psy. 1-2, Bact. 51 or equivalents
Phys. Ed. 43-44-45	Theory and Function of Play	½	3	½	Phys. Ed. 6 qtrs.
Phys. Ed. 54-55	Gym. for Junior Majors...	½	½	..	Phys. Ed. 51-52
Phys. Ed. 58-59	Advanced 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	Elementary Inter. Dancing.	1	1	1	Phys. Ed. 6 qtrs.
Phys. Ed. 75	History of Physical Ed.....	1	..	..	
Phys. Ed. 80-81	Kinesiology	3	4	..	Anat. 4, Farm Eng. 23
Phys. Ed. 82	Physical Examination	..	..	2	Phys. Ed. 80-81
Phys. Ed. 83	Technique of Teaching and Principles of Gymnastics..	..	..	4	Phys. Ed. 54-55, 80-81
	Electives[5]	8	3	..	
		16	16½	16½	

[1] For description of course see bulletin of College of Science, Literature, and the Arts.

[2] The entire course must be completed before credit is received for any quarter.

[3] For description of course, see bulletin of Medical School.

[4] Course must be taken junior year if not taken sophomore year.

[5] Eight credits must be elected from among educational subjects listed on p. 19 of this bulletin for teacher's certificate.

Senior Year

No.	Title	Credits F	Credits W	Credits S	Prerequisite Courses
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. 72-73	Senior Gymnastics	½	½	..	Phys. Ed. 54-55
Phys. Ed. 85-86	Principles of Physical Education	..	2	1	Phys. Ed. 44, 84, 91
Phys. Ed. 87	School Hygiene and Technique of Teaching Personal Hygiene	3	..	..	Physiol. 58-59 and Prev. Med. 53
Phys. Ed. 88-89-90	Orthopedic and Remedial Gymnastics	1	1	1	Phys. Ed. 82
Phys. Ed. 91	Principles of Dancing	2	..	..	Phys. Ed. 59, 67-68
Phys. Ed. 92-93-94	Practice Teaching	2	2	2	Phys. Ed. 56-57, 60-61, 63-64-65, 69-70, 83, 91
Phys. Ed. 97	Organization and Administration	..	3	..	
	Electives	5	5	5	
		14½	14½	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)
Home Economics, 70, Nutrition Survey (Freshmen or Sophomores)
Home Economics, 170, Nutrition of the Family
Home Economics, 171, Child Nutrition

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. 20w	0	Basket-Ball	All	
Phys. Ed. 21s	0	Baseball	All	
Phys. Ed. 22-23	0	Elementary Swimming	Soph.	None
Phys. Ed. 43-44-45	4	Play and Playground.....		Phys. Ed., 6 qtrs.
Phys. Ed. 51-52	1	Soph. Major Gymnastics...	Jr., sr.	Phys. Ed. 1-2-3
Phys. Ed. 54-55	1	Junior Major Gymnastics...	Jr. minors	Phys. Ed. 51-52
Phys. Ed. 64-65	2	Basket-Ball, Baseball with Technique	Sr. minors Jr., sr.	Phys. Ed. 20w-21s
Zool. 1-2	10	General Zoology	All	No prereq.
Anatomy 4s	5	Human Anatomy	Soph., jr.	Zool. 1-2
Phys. Ed. 80	3	Kinesiology	Jr., sr.	Zool. 1-2, Anat. 3
Phys. Ed. 83	4	Technique of Teaching and Principles of Gymnastics..	Sr.	Phys. Ed. 80, 54-55
Prev. Med. 50	3	Public and Personal Health.	Jr., sr.	Zool. 1-2, Psy. 1-2

PUBLIC SCHOOL MUSIC

FOUR-YEAR CURRICULUM IN THE COLLEGE OF EDUCATION

Major Advisers: Carlyle Scott, A. Pepinsky

First Year

	Credits F	W	S
Rhetoric A,B,C.....	5	5	5
Harmony 1-2-3	3	3	3
Sight Singing and Vocal Ear Training (Solfeggio)	1	1	1
Piano	2	2	2
Voice	2	2	2
Class Inst. Teaching (1 period strings; 1 period winds)..	1	1	1

Second Year

	Credits F	W	S
Gen. Psychology 1, 2.....	3	3	..
Grade School Methods and Practice Teaching (Mu. Ed. 29-30-31)	3	3	3
Analysis, Mu. Ed. 103-104-105	1	1	1
History of Music, Mu. Ed. 106-107-108	3	3	3
Piano, Voice or other instrument	2	2	2
Adv. Class Inst. Teach. (1 period strings; 1 period winds) Mu. Ed. 74-75-76..	1	1	1
Electives[1]	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.

Third Year

	Credits F	W	S
Instrumentation and Orchestration	2	2	2
High School Methods and Practice Teaching (Mu. Ed. 32-33-34)	3	3	3
Ed. Psy. 55	..	3	..
Piano, Voice or other instrument	2	2	2
Orchestra or Chorus as elective	1	1	1
Electives[1]	3	3	3
Ed. Elective[2]	3	..	3

Fourth Year

	Credits F	W	S
Orchestra Conducting (Mu. Ed. 64-65-66)	2	2	2
Piano, Voice or other instrument	2	2	2
Ensemble, Mu. Ed. 112-113-114	2	2	2
Normal Piano (elective), Mu. Ed. 86-87-88	2	2	2
Orchestra or Chorus as elective	1	1	1
Other electives[1]	2	4	4

SCHOOL HEALTH WORK

Major Adviser: H. S. Diehl

This course is designed to prepare students to take charge of health programs in school systems which do not provide specialists in the various phases of school health work. In the smaller systems such persons may teach health education and allied subjects, such as biology, in high school and supervise the health work in the elementary schools. Since the responsibility of persons in these positions will cover all phases of school health work such as physical inspections, control of contagious diseases, correction of physical defects and the teaching of health and physical education, the aim has been to provide a broad background in the whole field of health education, rather than a high degree of specialization in any one aspect of the problem.

Teachers of experience who are graduates of two-year courses in teachers colleges will be allowed the usual 90 credits toward the completion of the course. Graduates or students in nursing, physical education, home economics, elementary education, and others will be allowed advanced credit, determined in each case by their previous training. The work of all students desiring advanced credit toward the completion of the course will be evaluated and a program of studies worked out for each student on an individual basis.

Provision also is made whereby those who have completed the course and have had experience in the field may pursue a fifth year of graduate work, specializing in some phase of the school health problem such as physical education, school nursing, health instruction, etc.

Students in this course will be selected by the advisory committee on the basis of their ability and qualifications for the work.

Ed.Ad. 75	The Elementary School	3
Ed.Ad. 65	The High School	3
Ed. 3	Educational Sociology	3
H.Ed. 1	History of Education	5
Ed.Ad. 158	Organization for Supervision	3
Ed.Ad. 167	Junior High School	3

[1] Electives should be chosen to meet the teaching minor requirement in one secondary school subject such as English, public speaking, art, etc.

[2] Six credits are to be elected from among the following courses:

FOUR-YEAR CURRICULUM IN SCHOOL HEALTH WORK

Freshman-Sophomore

		Credits
Eng. A-B-C	Freshman English	15
Hist. 1-2	Modern World	10
Chem. 1,2,3 (or 4-5)	General Inorganic Chemistry	10 or 8
P.M. & P.H. 3	Personal Hygiene and Elementary Sanitation	2
Soc. 1	Introduction to Sociology	5
Psy. 1	General Psychology	6
Zool. 1-2	General Zoology	10
Anat. 3	Human Anatomy	5
Physiol. 4	Human Physiology	4
Bact. 51	General Bacteriology	5
Speech 22	Fundamentals of Speech	3
H.E. 70	Nutrition Survey	2
P.M. & P.H. 2	First Aid	1
	Total required credits	76 to 78

Approved electives to total 90 credits and usual freshman and sophomore courses in physical education are required.

Junior-Senior

		Credits
Phys.Ed. 80	Kinesiology and Physiology of Exercise	3
Phys.Ed. 85	Principles or Philosophy of Phys. Educ.	2
Phys.Ed.[1]	Technique of Teaching Motor Activities, Play, Dancing, Games, Gymnastics, etc.	3
Phys.Ed. 88-89-90	Theory and Technique of Orthopedic and Remedial Gymnastics	3
Phys.Ed. 92	Practice Teaching in Physical Education	2
Phys.Ed. 97	Organization and Supervision of Physical Educ.	3
Ed.T.(Ar)	Health Education Methods and Materials	2
Ed.T.(Ar)	Health Education Practice Teaching	3
P.M. & P.H. 53	Elements of Preventive Medicine	3
P.M. & P.H. 59	Social Hygiene	1
P.M. & P.H. 61	Mental Hygiene	1
P.M. & P.H. 69	School Nursing—Principles, Techniques and Practices.	4
P.M. & P.H. 80	Health Supervision of School Child	3
P.M. & P.H. 106	School in Relation to Public Health Organizations	2
Ed.Psy. 55	Educational Psychology	3
Ed.Ad. 65	The High School	3
Ed.Ad. 75	The Elementary School	2
Ed.Ad. 119	Elementary Curriculum	
or	or	
Ed.Ad. 181	Technique of Elementary Instruction	2
Ed.Ad. 124	Educational Administration	3
Ed. Ad. 150	Principles of Supervision	2
H.E. 171	Child Nutrition	3
Soc. 51	Occurrence of the Socially Inadequate	3
Soc. 52	Elem. Case Work	3
Soc. 90-91	Elem. Field Work	4
C.W.I. 130	Development of Young Child	3
C.W.I. 170	Parental Education	3
Bot. 101	Elementary Biometry	3
	Total required credits	72
	Approved electives	18
		90

[1] This course is a specially adapted course in the Department of Physical Education for Women for this curriculum and will be developed as there is a demand for it.

Recommended Electives

		Credits
Ed.Ad. 133	Guidance in Secondary School	3
or	or	
Ed.Ad. 169	Extra-Curricular Activities	(2)
Ed. Psy. 134	Mental Testing	
or	or	
Ed.Psy. 143	Individual Mental Examination	2
Ed.Psy. 159	Psychology of Personality	2
Ed.Psy. 192-193	Psychology of Behavior Problems	4
H.E. 170	Nutrition of Family	3
Bact. 101	Special Bacteriology	4
Bact. 116	Immunity	3
Anat. 135	Physical Development of Child	2

Graduate Work

Graduate work, leading to specialization along the lines of supervision in physical education, school nursing, or health education, may be followed by properly qualified students, preferably after some actual experience in the field of school health work. Permission to pursue graduate work in this field must be obtained from the advisory committee on school health work. Students who register in the Graduate School and fulfill its various requirements will receive appropriate graduate degrees.

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. A minimum of 10 credits in three of these departments required.

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, and more advanced work. Political Science 1, 2, 11 or 15 and one course in foreign governments or relations. Sociology (see departmental 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	1[illegible]
Education 1, 3, 55, and 15	14
	45

Senior Year

	Credits
Economics 3	5
Economics 141	3
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[1]

Major Adviser: F. S. Chapin

MAJOR IN SOCIAL THEORY[2] (36-37 hrs.)

Course No.	Name of Course	Course No.	Name of Course
Soc. 1	Introduction to Sociology	Soc. 101[3]	Social Organization
Soc. 6	Social Interactions	Soc. 102[3]	Social Control
Soc. 14	Rural Sociology	Soc. 110	Community Organization and Social Work in Small Towns and Country
Soc. 53	Elements of Criminology	Soc. 114	Rural Social Institutions
or		or	
Soc. 45	Social Statistics	Soc. 140	History of Social Theory
Soc. 51	Occurrence of the Socially Inadequate	Soc. 121	Advanced Statistical Methods
Soc. 119	The Family	or	
or		Soc. 141	Contemporary Social Theory
Soc. 120	Social Progress		
Soc. 100	Social Psychology		

MAJOR IN APPLIED SOCIOLOGY[4] (36-37 hrs.)

Course No.	Name of Course	Course No.	Name of Course
Soc. 1	Introduction to Sociology	Soc. 119	The Family
Soc. 14	Rural Sociology	or	
Soc. 45	Social Statistics	Soc. 134	Legal Protection of the Child
Soc. 51	Occurrence of the Socially Inadequate	Soc. 110	Community Organization and Social Work in Small Towns and Country
Soc. 52	Elementary Case Work	or	
Soc. 60	Child Welfare	Soc. 114	Rural Social Institutions
Soc. 90	Elementary Field Work	or	
Soc. 91	Elementary Field Work	Soc. 128[5]	Principles of Administration Applied to Social Work
Soc. 100	Social Psychology	or	
Soc. 112	The Rural Social Survey	Soc. 130[5]	Advanced Case Work
or			
Soc. 122	Methods of Social Investigation		

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.

[1] In order to secure a teacher's certificate, students majoring in sociology must complete two teaching minors.

[2] Soc. 116, The Newspaper As a Social Institution; Soc. 158, Sociology of Revolution; or Soc. 160, Social Population, may be substituted, upon the recommendation of the adviser, for any three-credit course which appears in this curriculum.

[3] Soc. 103, Sociology of Conflict, may be substituted for this course.

[4] Soc. 70, Group Work in the Community, and Soc. 71, Elementary Field Training in Group Work, may be substituted for Soc. 52, Soc. 90, and Soc. 91.

[5] Soc. 126, Technique of Leadership, may be substituted for this course.

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	Credits	Winter	Credits	Spring	Credits
Eng. A, Fresh. English	5	Eng. B, Fresh. English	5	Eng. C, Fresh. English	5
Art Ed. 1f, Art Education	3	Art Ed. 2w, Art Education	3	Ed. 1, Introd. to Sociology	5
Zool. 1, Zoology	5	Zool. 2, Zoology	5	Art. Ed. 3s, Art Education	3
Elective	2	Elective	2	Elective	2

Sophomore Year

Fall	Credits	Winter	Credits	Spring	Credits
Psy. 1, Psychology	3	Psy. 2, Psychology	3	H.E. 57, Weaving on Table Looms	3
Psy. 4, Psychology Lab.	2	Psy. 5, Psychology Lab.	2	Ind. Ed. 10, Meth. Elem. Grade Woodwork	3
Hist. 1, History	5	Hist. 2, History	5	Ed. Psy. 55, Ed. Psy.	3
Art Ed. 37, Art Education	2	Art. Ed. 32, Art Education	1	Elective	6
Elective	3	Ind. Ed. 11, Meth. Prim. Grade Woodwork	2		
		Elective	3		

College of Education

Junior Year

Fall	Credits	Winter	Credits	Spring	Credits
Phys.Ed. 43, Play and Playground	1	Phys.Ed. 44, Play and Playground	1	Phys.Ed. 45, Play and Playground	1
Ed.Psy. 134, Mental Tests	2	Ed.Psy. 135, Mental Tests	2	Ed.Psy. 184, Mental Deficiency	2
Phys.Ed. 31, Physical Ed.	0	Phys.Ed. 32, Physical Ed.	0	Ed.Psy. 136, Mental Tests	2
Ed.T. 181, Tech. of El. Inst.	3	Ed.T. 155, Super. of Arith. in the Elem. School (Lower grades)	2	Phys.Ed. 33, Physical Education	0
Ed.T. 143, Teach. of Reading in Elem. Grades	2	Electives	10	Electives	8
Electives	6				

Senior Year

Fall	Credits	Winter	Credits	Spring	Credits
Ed.Psy. 111, Ed. Measurements	3	Elem. Case Work	3	Child Welfare	3
Soc. 51, Sociology	3	Ed.T. 17. Practice Teaching	2	Ed.T. 17, Practice Teaching	2
Ed.T. 17, Practice Teaching	2	Electives	10	Electives	10
Electives	7				

TEACHER TRAINING IN ELEMENTARY EDUCATION

Major Adviser: W. E. Peik

This special curriculum is planned for persons who expect to enter the field of teacher training in elementary education. The demand at the present time comes from normal schools, teachers colleges, and high school or county normal departments for directors, supervisors, and critic teachers. The Master's degree is usually required for normal school and teachers college positions. Rural teaching experience and the Bachelor's degree are required in Minnesota to qualify for positions in high school normal departments.

The course listed below presupposes a full two-year normal or a junior college course. The completion of two additional years of work entitles the students to the degree of bachelor of science and to the university teacher's certificate in elementary education. The satisfactory completion of a third year in the graduate school entitles the student to the Master's degree and to a university certificate in teacher training.

Adjustments in the prescribed courses to meet the requirements of state departments or the specific needs of a student may be made with the approval of the student's major adviser and the faculty.

A. REQUIRED IN EDUCATION

		Credits
Ed.Psy. 56	Educational Psychology	3
Ed.Psy. 60	Introduction to Statistical Methods	3
Ed.Psy. 134	Mental Tests	2
Ed.Ad. 24	Public School Administration	3
Ed.Ad. 75	The Elementary School (Not required of normal graduates)	3
Ed.Ad. 119	The Elementary School Curriculum	3 or 4
Ed.Ad. 150	Supervision and Improvement of Instruction	2
Ed.Ad. 151	Supervision: Uses of Educational Tests and Measurements	2
Ed.Ad. 156	Practice Supervision (Field Work and Observation)	3
Ed.Ad. 172	Elementary Curriculum and Course of Study Construction	2
Ed. T. 181	Technique of Elementary School Instruction	3 or 4
Ed.T. 185	Investigation of Problems in Teacher Training	2 or 4
		31

In addition 14 hours to be elected from the courses below

Ed.T. 45	The Teaching of Geography and History in the Elem. School	2	
Ed.T. 143	The Teaching of Primary Reading	2	
Ed.T. 144	The Teaching of Intermediate and Upper Grade Reading	2	
Ed.Ad. 152	Adjustment of Schools to Individual Differences	2	
Ed.Ad. 153	The Supervision of English	2	
Ed.Ad. 154	The Supervision of Social Studies	2	
Ed.Ad. 155	The Supervision of Arithmetic	2	
Ed.Ad. 157	Practice in Supervision	3	
Pub. Sch. Mus.	Courses in Music Education (with approval only)	2-5	
Art Ed.	Courses in Art Education (with approval only)	2-5	
Phys.Ed.	Courses in Physical Education (with approval only)	2-5	
Ed.Psy. 113-114-115	Psychology of Elementary School Subjects	6	
Ed.Psy. 159	Psychology of Personality	2-4	14
	Total credits in education		45

B. REQUIRED COURSES IN ACADEMIC SUBJECTS

Nine or ten credits in each of four of the following academic fields including English and social studies, or eighteen credits in each of two of the following fields or such others as may be approved:

English, English literature, history, geography, political science, social studies, languages, mathematics	36	
General electives (recommended to be in academic subjects)	9	45
Total credits required for the university teacher's certificate and the bachelor of science degree		90

C. ADDITIONAL YEAR IN THE GRADUATE SCHOOL

For the work of the fifth year, the candidate for the Master's degree and for the university certificate in teacher training must satisfy the requirements of the Graduate School (see Graduate School bulletin). The language requirement may be waived in all cases where a language is not necessary in the thesis or the special work to be pursued.

VISITING TEACHERS

FOUR-YEAR CURRICULUM

Major Adviser: F. S. Chapin

JUNIOR COLLEGE

Freshman Year

	Credits
English A-B-C	15
History 1, 2, or 3 or Language	10
Zoology 1-2	10
Sociology 1	5
Political Science 1	5
	45

Sophomore Year

	Credits
History 7-8	10
Economics 6-7	10
Psychology 1-2	6
Political Science 2	5
Sociology 6, 45, 49	11
	42

College of Education

Junior Year

	Credits
Education T, 15	3
Hist. Ed. 1, Ed. Psy. 55	8
Sociology 52, 53, 79, 90, 91	13
Home Economics 70-71-72, or Child Welfare 50, 51, 60	9
	33

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. 144-45	6
Sociology 60, 92, 128, 130, 134, 138-139	18
Sociology 153-154-155	9
	44

DESCRIPTION OF COURSES

GENERAL COURSES

Ed.50. Art Appreciation. The enjoyment of the visual arts. Illustration of governing principles by practical experience. No technical requirements. Contact for superintendents and supervisors with a so-called "special subject."

Ed.208. Methods in Educational Research. A study of the methods employed in the investigation and report of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for graduate degrees.

Ed.228-229-230. Problems of College Education:

Ed.228f. Problems of Student Personnel.

Ed.229w. Problems of Curriculum and Instruction.

Ed.230s. Problems of Organization and Administration.

ADMINISTRATION AND SUPERVISION

Ed.Ad.24. Public School Administration. The organization and administration of public schools in relationship to the teacher and other staff members.[1]

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.Ad.65T.)

Ed.Ad.75. The Elementary School. A study of the modern elementary school: development; function; objectives; relation to junior and senior high schools; a survey of the curriculum; the materials of instruction; a special emphasis upon the general methods. An orientation course for those who plan to take advanced work in administration, supervision, elementary education, or teacher training.

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. Organization of the Elementary School. Problems relating to the organization for instruction and classification of pupils in elementary schools with critical examination of current practices.

Ed.Ad.119. The Elementary School Curriculum. Study of the principles underlying the selection and organization of subject-matter for courses in the elementary school; examination of curricula, syllabi, and texts in the light of their function. Survey of the procedures and findings of scientific research in curricular content by subjects.

[1] For teachers.

Ed.Ad.119T-120T. The Elementary School Curriculum. (Same as above for teachers. Offered every other year on Saturday morning.)

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. Public School Administration. The organization, administration, and general support of public schools in states and local school districts.

Ed.Ad.125. Techniques in Administration. Standard practices regarding child accounting problems, records and reports; procedures having to do with personnel and school board relations and rules and regulations; standard office practices, including textbook and supply management.

Ed.Ad.126. School Plant Management. Plant program planning and financing, including operation and maintenance of public school buildings.

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.129. Educational Publicity Materials. Analysis of current and desirable practices in educational publicity. Planning in detail a publicity program and current publicity materials for a public school system.

Ed.Ad.130. Educational Publicity Agencies. Relationship of superintendent to community agencies directly or indirectly interested in public education. Problems of personal contacts, public speaking, parent-teacher and similar organizations, board meetings as a publicity agency.

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.150. Supervision and Improvement of Instruction. 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.151. 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.152. Supervision—The Adjustment of Schools to Individual Differences. The adaptation of the curriculum to the abilities and interests

of pupils; methods of classification; emphasis upon classroom procedures.

Ed.Ad.153. 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.154. 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.155. 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.156. Practice Supervision—Observation and Field Work. Classroom visitation followed by conference in the university elementary demonstration school, the University High School, and other schools in or near the Twin Cities. The application of supervisory techniques; conferences; special projects.

Ed.Ad.157. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul.

Ed.Ad.158. Organization for Supervision. The organization and the administration of a public school system for supervision, treating specifically the delegation and co-ordination of the supervisory responsibilities of all staff members associated in these activities.

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.172. Elementary Curriculum and Course of Study Construction. A study of the techniques and of special problems in the field of elementary curriculum and course of study making. Class and individual projects.

Ed.Ad.175. Financial Aspects of Public School Business Administration. Financial program planning, budgeting accounting, cost finding, income

and expenditure control; and the preparation and analysis of financial 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.184. Supervision of Practice Teaching. A course primarily for teachers engaged in the direction of practice teachers in secondary education.

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. (Not offered in 1928-29.)

Agr.Ed.42. Supervised Teaching Experience. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings.

Agr.Ed.64. Survey of Agriculture. A course in general agriculture designed to give students practical familiarity with fundamental principles and basic facts, best procedures, literature, and important problems of agriculture in this region.

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 practices 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.

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. (Not offered in 1928-29.)

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. (Not offered in 1928-29.)

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. Opportunity 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.

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 Presentation. Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research.

Agr.Ed.181-182-183. Teaching Agriculture. A study of all activities of the teacher in conducting a high school agriculture department in Minnesota including all day, part time, evening, and elementary classes, and community activities. Observation, participation, reading, preparing plans, criticisms, discussions, reports.

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

DESIGN

ArtEd.1-2-3. Fundamental Principles of Design. Elementary problems involving space breaking, value relations, the decorative use of nature material, creative use of symbols; application to problems developed in the handicrafts, and to the home.

ArtEd.20-21-22. Principles of Harmony in Form and Color. Color theories discussed and exemplified, with analysis of color harmonies and original work therein. Application of color harmonies in original designs with reference to execution in handicrafts and by industrial 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.55-56-57. Fundamental Art Principles. Planned for teachers of subjects other than art.

ArtEd.153-154. Design for the Consumer. 153—Problems of house planning, decoration, and furnishing; 154—Problems of costume selection and designing, settings and costumes in stage design. Subject-matter appropriate for art teaching in high schools and colleges. Emphasis on art principles; art history an important part of this course; original research problems and applications in the field.

DRAWING

ArtEd.4,5,6. Still Life. Drawing from objects in charcoal and pencil. Emphasis on form, value relations, perspective.

ArtEd.7,8,9. Sketch in Charcoal and Pencil from the Posed Figure. Action and memory drawing. Emphasis on action, form, and value relations.

ArtEd.10-11-12. Graphic Composition. Drawing from imagination. Stimulation by poetry and music.

ArtEd.23,24,25. Water Color Drawing. Emphasis on color, form, and technical handling.

ArtEd.26,27,28. Pencil and Pen Techniques. Drawing in these media. Fundamental to problems in commercial art.

ArtEd.29,30,31. Sketch from Pose. Rhythmic expression; memory drawing; blackboard experience.

ArtEd.60,61,62. Advanced Water Color.

ArtEd.63,64,65. Advanced Techniques.

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.

ArtEd39. 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.

See Note under statement of requirements for the art major.

THEORY AND PRACTICE OF ART TEACHING

ArtEd.80,81,82. Types of Art Instruction. A special methods course with especial reference to the problems needed in practice teaching in the Minneapolis public schools. Attendance upon art supervisor's meetings and visits to the supervisory office.

ArtEd.83. Problems in Art Education. A survey of art teaching practices; study of governing principles; history and philosophy of art teaching; making of courses of study for public school application.

ArtEd.86,87,88. Practice Teaching in Art. Actual experience under public school conditions.

ArtEd.189. Application of Esthetic Theories in Public School Art Education. An integration course. Original research problems.

EDUCATIONAL PSYCHOLOGY

Ed.Psy.55. Educational Psychology. A survey of fundamental facts of human behavior, involved in educational activities. Particularly designed for high school teachers. Open to juniors and seniors.

Ed.Psy.56. Educational Psychology for Elementary School Teachers. This course is similar to Ed.Psy.55 but particularly adapted to the needs of the elementary school teacher.

Ed.Psy.60. Introduction to Statistical Methods. To supply the statistical techniques necessary for an understanding of educational literature and for the pursuit of studies in education and related fields. The course includes a study of measures of central tendency, variability, and correlation.

Ed.Psy.111-112. Educational Measurements in the Elementary School. 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.113-114-115. Psychology of Elementary School Subjects. A discussion of the research studies in the field of the psychology of elementary school subjects.

Ed.Psy.116-117. 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.133. Systematic Educational Psychology. Advanced course covering the field of psychology as related to education. Open to seniors and graduate students.

Ed.Psy.134. Mental Tests. A laboratory study of group mental tests used in the kindergarten, elementary school, high school, and college with special emphasis upon their reliability and validity as instruments for educational guidance.

Ed.Psy.135-136. Problems in Mental Testing. A study of the practical problems of mental testing in the public schools with special reference to the administration of group mental tests. Projects involving testing and classification of pupils.

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 133 or 190, 191, 192, 193-194.

Ed.Psy.141. Psychology of Speech Disorders.

Ed.Psy.143-144. Individual Mental Examination. For teachers of subnormal 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.145. Special Problems in the Field of Individual Mental Testing.

Ed.Psy.146-147. Child Guidance. Specific problems in school adjustment dependent upon physical and emotional factors of the child, the home, and the environment. Case records giving family and personal histories, physical condition, psychometric rating, and personality presented. Class discussion of the recommendations.

Ed.Psy.149-150-151. Psycho-Educational Clinic. Conducted in co-operation with existing clinics and agencies in the Twin Cities. Students will receive practice in giving psychological examinations, in case study, 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.157. Psychology of Child Development. The physical, mental, social, and emotional development of children from birth to adolescence.

Ed.Psy.158. Psychology of Adolescence. A study of the physical and mental changes that characterize the transition from childhood to adult life. Implications for educational guidance during the period of secondary education.

Ed.Psy.159. Psychology of Personality. Theoretical basis. Survey of methods for the measurement and study of character and the emotions. Relation to school success and other factors in the school situation. Genetic development of personality traits in childhood and adolescence.

Ed.Psy.183. Psychology of Gifted Children. A study of the physical and mental traits of gifted children and the methods of their education.

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.187. Practice in Personnel Work. Course designed to give properly qualified students practical experience in the use of psychological and related methods in dealing with school children.

Ed.Psy.189. The Human Organism. The development of the human organism in relation to educational practice.

Ed.Psy.190. Original Nature of Man. Advanced work in genetic psychology, man's unlearned behavior, and inherited capacities.

Ed.Psy.191. Individual Differences. A study of group and individual differences and their relations to educational practice.

Ed.Psy.192. Recent Literature in Educational Psychology. Readings and reports on problems in educational psychology.

Ed.Psy.193-194. Psychology of Learning. A study of the experiments in learning in the laboratory and in the classroom.

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.

H.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. The psychological bases for teaching; methods of teaching applied to home economics. Required of all students preparing to teach.

H.E.Ed.49. Observation and Teaching: General Home Economics. Observation of classes in day schools and evening schools; teaching under supervision of at least two phases of home economics; individual and group conferences on teaching problems.

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.143. Home Economics Curricula. A study of the objectives of home economics in the junior and senior high schools; organization of curricula.

H.E.Ed.147. Organization and Methods for Related Art Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes.

H.E.Ed.149. Research Problems. A study of the methods used in collection, treatment, and interpretation of data in the field of home economics.

INDUSTRIAL EDUCATION

Ind.10. Methods in General Shopwork. The selection and organization of content for multiple-activity courses. Teaching methods and devices, including the use of individual instruction sheets; consideration of shop plans and equipments.

Ind.11. Special-Class Woodwork. This course is designed for primary grade teachers, teachers of subnormal children, teachers of art, etc. Lectures and shopwork. The manipulative experience is divided into three parts: flat piece work, assembled and movable parts, and toy furniture. Special attention to finishes. (Not open to those with credit in woodwork.)

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, periodica's, 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—break-ups, and classification of materials.

Ind.42. Course Organization. Makes definite use of occupational analyses prepared in Course Ind.40. Content of courses determined and arranged. Reference materials collected. Both general industrial and vocational courses considered.

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 co-operation. The special significance of social agencies to vocational education under public support and control.

Ind.61. Social Significance of Vocational Education. A study of the basic facts of economics and sociology which support efforts in the organization and administration of vocational 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; special reference to mathematics, drawing, science, and safety; group study and unit courses considered; usable methods and the means of supervision. Both incidental and scheduled teaching discussed.

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 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. Supervision practices and problems.

Ind. 105. Industrial Education. For superintendents, principals, and teachers not specializing in the field named. General and vocational phases considered. Objectives, administration and supervision; programs, courses, and practices; laws, rulings, and standards for aid; significant literature.

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 earnings situation; attendance and child labor laws; guidance, placement, and follow-up plans.

Ind. 150-151-152. Problems 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. 170. 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.171. 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.172. Administration of Industrial Education—Part Time Schools. 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.

NOTE.—See Education bulletin Part II for statement about shopwork and drawing courses.

INSTITUTE OF CHILD WELFARE[1]

C.W.40. Child Training. A study of the physical and mental development of the child followed by a discussion of the problems of training of

[1] The institute also offers Courses T30-34, and T85-90 listed under the Theory and Practice of Teaching.

young children. Observations in the Nursery School, lectures, and reports.

C.W.60. The Nursery School and Parental Education Movement. To orient student with reference to the Nursery School and parental education. Consideration given also to the kindergarten and Montessori movement and to the physical and mental hygiene movement.

C.W.80. Child Psychology. A survey of child development with special reference to nursery school and kindergarten education.

C.W.90. Physical Development of the Young Child. The physical growth and development of the young child in its anatomical, physiological, and functional aspects.

C.W.120. Health Care of the Young Child. A course in the physical care, illnesses, prevention of disease, and health problems of the young child. Primarily for those who have charge of groups of children, and for workers in parental education. Opportunities for observation in the Nursery School and in clinics. With the co-operation of the Department of Pediatrics.

C.W.130. The Development of the Young Child. An advanced course dealing with the development of the pre-school child from the anatomical, physiological, psychological, educational, and social aspects. Lectures, readings in the experimental literature, and reports.

C.W.133, 134,[2] 135. Observational and Experimental Methods in the Study of the Development of the Young Child. A study of the various methods and techniques such as growth records, mental tests, ratings, controlled observations, etc., used in the experimental study of the young child. Practical exercises and problems on institute records and data.

C.W.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.173-174[2]. 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.190-191.[2] Mental Examination of Pre-school Children. A study of the methods used in testing young children together with practice in such testing.

C.W.230-231-232. Seminar in the Development of the Young Child. Reviews of current literature, discussion of fundamental problems and reports on research. Meetings in alternate weeks.

C.W.233-234-235. Research in the Development of the Young Child.

C.W. 250-251-252. Seminar in Nursery School Education. Reviews and interpretations of current literature, discussion of fundamental problems and theory, problems of administration and organization.

[2] Two quarters must be completed before credit is received for any quarter.

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.A,B,C. Elementary Physical Education. Elementary gymnastics, i.e., free exercises, marching tactics, apparatus work, gymnastic dancing, group games, physical efficiency tests. Majors in physical education must substitute this course for Phys. Ed. 1, 2, 3.

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 gymnasia 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; insignia 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.24. Sophomore Horseback Riding. Lessons for beginning and advanced classes under competent instruction and supervised by a member of the Physical Education Department. Students registering for this course will pay for riding lessons at about $1 per lesson and will be exempt from the physical education fee.

Phys.Ed.25-26. Sophomore Intermediate Swimming.

Phys.Ed.27. Sophomore Golf. For students who know the rudiments of golf. Instruction in the technique of the various strokes, etc. Class work will be held at the University Recreation Field. Students registering for this course will be held for the regular golf fee.

Phys.Ed.27. Sophomore Golf. For beginners. Instruction and practice in the use of the driver, mid-iron, mashie, and putter. Instruction also in the fundamentals of golf, rules, and etiquette.

Phys.Ed.28-29. Sophomore Advanced Swimming.

Phys.Ed.30. Sophomore Life Saving and Water Sports.

Phys.Ed.31. Sophomore Skating. Practice and technique of skating, including simple figure skating and form in speed skating.

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. Theory and Function of Play. Graded games, folk dances, and track for school and playground, two hours. A consideration of the nature and function of play, 3 hours.

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, tennis, 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.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 Teaching and Principles of Gymnastics. A study is made of the educational philosophy underlying gymnastics, principles of progression, and methods of teaching gymnastics. Practice teaching is done within the group.

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. School Hygiene and Technique of Teaching Personal Hygiene. A study of problems in school hygiene and sanitation with specific emphasis on the study of the methods of teaching personal hygiene in

preparation for practical application in the schools through practice teaching and projects.

Phys.Ed.88-89-90. Orthopedic and Remedial Gymnastics. Lectures, demonstrations, individual work with cases. Discussion held relative to the various defects met with the 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. University, University High School, and public schools afford the practice material.

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.

Activities for Which No Registration Is Required

Elective Sports. Fall: field hockey, volley ball; winter: basket-ball, ice hockey; spring: track, baseball, swimming.

General Swimming. For both beginning and advanced swimmers and divers. Shower bath tickets may be bought of the matron.

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 preschool 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.29. Grade School Methods. First term. This course is designed to meet the requirements for music supervisors. Practical methods for grades one and two. Particular attention is given to the child voice, its care and development.

Mu.Ed.30. Grade School Methods. Second term. Methods of teaching vocal music in grades three, four, five, and six. Theory and practice of teaching combined in class work. Students are required to observe in the Minneapolis and St. Paul public schools.

Mu.Ed.31. Grade School Methods. Third term. Same as above for grades seven and eight. Particular attention to the problems of the changing voice. Also includes a short course in methods of teaching appreciation.

Mu.Ed.32. High School Methods. First term. Methods of teaching music in the modern high school. Materials and organization of chorus and glee clubs. Students are required to observe in the Minneapolis and University high schools.

Mu.Ed.33. High School Methods. Second term. Application of methods of teaching by practical work with the class itself. Students are required to observe and teach in the Minneapolis and University high schools.

Mu.Ed.34. Voice. A practical course in methods of class voice teaching, in the use and care of the changing voice and adult voice. Testing and classification of voices in the junior and senior high schools. Also includes methods of conducting chorus and glee clubs.

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.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.71-72-73.[1] Class Instrument Teaching. Fall quarter, beginner's classes in violin, viola, cello, and bass; spring quarter, beginner's classes in flute, oboe, clarinet, and bassoon; winter quarter, beginner's classes in all brass and percussion instruments.

Mu.Ed.74-75-76.[1] Advanced Class Instrument Teaching. Practical orchestral and band routine under baton of the director and members of class in Orchestra Conducting 64-65-66.

[1]A special fee of $3 per quarter is charged for these courses.

SOCIAL SERVICE—HOSPITAL

S.S.60. Principles and Practices of Hospital Social Service.

S.S.61. Field Work (H.E.156). Practical work in respective specialized fields available for home economics students. Limited to groups of eight.

S.S.62. Hospital Economics and Relationships. Lectures covering backgrounds, aims, and interdependence of groups. Emphasis on social, psychological, and ethical factors.

S.S.63. Occupational Therapy. Lectures covering history, development, and relationships; institutional values.

S.S.65. Application of Principles and Practices of Hospital Work. Selected medical-social problems as related to other professional groups.

S.S.66. Preliminary Hospital Practice Training—Home Patients. Student is given opportunity to work with "home bound" patients under supervision.

S.S.67. Preliminary Hospital Practice Training—Hospital or Field Work. Includes (1) visits to departments in different types of hospitals to give the student a broad idea of the place and function of occupational therapy in each and (2) assignment for an observation period in hospital or field work.

S.S.68-69. Hospital Practice Training—Mental Disease. Student is given opportunity (under supervision) to do work in wards and workshop with cases of mental disease. Experience also includes recreation work with the patients. Student must be in residence at the institution.

S.S.70. Preliminary Hospital Practice Training—Tuberculous Patients. Student is given opportunity to do bedside work with tuberculous patients in hospital or sanatoriums.

S.S.71. Preliminary Hospital Practice Training—Orthopedic Patients. Student is given opportunity to do bedside and shop work (under supervision) with orthopedic patients or other work in related fields.

S.S.72. Hospital Practice Training—General. Student is in residence at institution where work is given. Work includes experience in administration of a department such as: training of attendants; equipment and supplies; use of waste material; disposal of products; keeping of records and charts, etc. Assignment based on worker's previous experience and future interests.

Ed.Psy.148. Problems of the Visiting Teacher. The function of the visiting teacher will be studied in relation to the personality, behavior, and scholastic difficulties of children. Lectures will be supplemented with an analysis of the experience of visiting teachers connected with the Commonwealth program for the prevention of delinquency.

SPECIAL EDUCATION

Ed.Psy.195. Seminar on the Work of the Visiting Teacher. An intensive study of case histories of pupils referred by the schools to visiting teachers. Opportunity will be offered students to present case histories drawn from their experience.

THEORY AND PRACTICE OF TEACHING[1]

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 Twin City schools. The course calls for 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 Zoology.
T.19. Teachers' Course in Botany.
T.20. Teachers' Course in Chemistry.
T.21. Teachers' Course in English Composition.
T.22. Teachers' Course in English Literature.
T.23. Teachers' Course in Geography.
T.35. Teachers' Course in Norwegian.

[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	Ella J. Rose
Industrial Education	Homer J. Smith
Physical Education for Men	G. F. Keller
Physical Education for Women	J. Anna Norris
Public School Music	Carlyle Scott, Abe Pepinsky
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. Such arrangements should be completed before the student registers in other courses.

T.37. Social Science for Senior High Schools. Selection and organization of content, preparation and presentation of data, and methods of teaching. Required of all students whose major is social science.

T.38. Methods and Problems in Secondary School Science. Organization and methods of secondary school sciences. Attention to general science, lesson planning, methods of presentation, assignments, measuring achievement. Open to students preparing to teach natural science. Required for practice teaching in science.

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.

T.83. Teachers' Course in Journalism.

JUNIOR HIGH SCHOOL TEACHING

T.14. Teaching Junior High School Mathematics. For students prepared to teach mathematics in the junior high school. Discussion of the course of study and methods of presentation.

T.39. Social Science for Junior High Schools.

T.50. Teaching of Composition 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.51. The Teaching of Literature 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.

KINDERGARTEN OR NURSERY SCHOOL TEACHING

T.30. Principles of Kindergarten and Nursery School Education. The development, aims, and organization of kindergarten and nursery school education. A consideration of the curriculum and methods to be employed.

T.31. Permanent Play Materials. A consideration of the various kinds and types of permanent play materials (blocks, dolls, trains, wagons, etc.) and their use by children of different ages.

T.32. Plastic Materials. The materials used in constructive work, paper, crayons, paints, clay, woodwork, sewing, sand, etc. The student will be given some opportunity for actual use of the materials and will gain considerable knowledge of the abilities of children of different ages.

T.33. Rhythms, Games, and Music for the Young Child. A course designed to train the student in the handling of a music and rhythm period and in group games. The student will be expected to take part in the rhythms and music work in both the nursery school and the kindergarten.

T.34. Story Telling for Young Children. A study of folk, fairy, here-and-now stories and poetry suitable for young children. The principles underlying story telling, the selection of the story, and versions. The educational importance of conversation with the child.

T.85-86-87. Methods and Observation. Two hours each week will be spent observing in the nursery school or in the kindergarten. There will be written reports of the observations and a class discussion of one hour in alternate weeks.

T.88-89-90. Practice Teaching in Kindergarten or Nursery School. Students must choose either nursery school or kindergarten practice teaching. If they desire, students may do practice teaching in both schools by putting in additional hours, but they can receive credit for only one. Practice will be arranged to give the student a varied experience, and each student will be assigned one child for intensive study throughout the year.

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 63 to 65.
Art Education, pages 65 to 66.
Home Economics, page 70.
Industrial Education, pages 70 to 72.
Nursery School Education, pages 72 to 73.
Nursing Education, page 40.
Physical Education for Men, pages 74 to 75.
Physical Education for Women, pages 76 to 78.
Public School Music, page 79.
Subnormal Education, page 81.

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. Foundation 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 and 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.143. The Teaching of Reading. Emphasis upon a study of the present content, materials of instruction, and teaching procedures in lower, intermediate, and upper grade reading; a survey of the contributions of research; class and individual projects. Classroom observation of reading.

T181. Technique of Elementary School Instruction. A course in the critical study and application of methods of teaching to elementary school subjects. Observation of classroom procedures in the demonstration school.

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.

T.185. Investigation of Problems in Teacher Training. A survey of practice and of the problems relating to the institutional and in service training of teachers; recent investigations and findings; selected problems; individual projects. Intended for normal training directors, critic teachers, and supervisors, and for others interested in the problems of the professional training of teachers.

See also Ed.228-229-230 under General Course, page 60.

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 84.

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