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¹ Absent on leave. 1924-25.

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 Aura Keever, B.S., Instructor in Home Economics Education

¹ Absent on leave, 1924-25.

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 Louise Soby, B.S., Instructor in Home Economics
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 Frank W. Peck, M.S., Associate Professor of Farm Management

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 Ingolf Friswold, B.S., Assistant in Educational Administration
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 Willard C. Olson, M.A., Assistant in Bureau of Educational Research
 Doris Stevens, B.A., Assistant in University High School

¹ Absent on leave, 1924-25.

Lucille Sutorious, B.S., Assistant in Art Education
 Oliver L. Troxel, M.A., Assistant in Educational Administration
 Austin H. Turney, B.S., Assistant in Educational Psychology
 Fred von Borgersrode, B.S., Assistant Director Bureau of Educational
 Research

MEMBERS OF OTHER FACULTIES GIVING INSTRUCTION IN
 THE COLLEGE OF EDUCATION

Fred L. Adair, B.S., M.A., M.D., F.A.C.S., Associate Professor of
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 Cephas D. Allin, LL.B., M.A., Professor of Political Science, Chairman
 of the Department of Political Science
¹William Anderson, Ph.D., Associate Professor of Political Science
 Leon E. Arnal, Architecte Diplômé Government France, Professor of
 Architecture
 Clyde H. Bailey, Ph.D., Professor of Agricultural Biochemistry
 Gertrude M. Baker, B.A., Assistant Professor of Physical Education for
 Women
 Francis B. Barton, Docteur de l'Université de Paris, Associate Professor
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 tures and Head of the Department of Scandinavian
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 Leroy A. Calkins, M.D., Ph.D., Assistant Professor of Obstetrics and
 Gynecology

¹ Absent on leave, 1924-25.

² Absent on leave, winter and spring quarters, 1924-25.

³ Absent on leave, fall and winter quarters.

- 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
- Royal N. Chapman, Ph.D., Associate Professor of Animal Biology
- Mary Ellen Chase, Ph.D., Assistant Professor of English
- Albert J. Chesley, M.D., Associate Professor of Preventive Medicine and Public Health
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- Edwin L. Clarke, Ph.D., Assistant Professor of Sociology
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- Lillian Cohen, Ph.D., Assistant Professor of Chemistry
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- Oscar W. Firkins, M.A., Professor of Comparative Literature
- John J. Flather, Ph.B., M.M.E., Professor of Mechanical Engineering
- Guy Stanton Ford, Ph.D., Professor of History and Chairman of the Department of History

¹ Absent on leave, 1924-25.

- James H. Forsythe, M.A. in Arch., Associate Professor of Architecture
 William S. Foster, Ph.D., Professor of Psychology
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 Edward M. Freeman, Ph.D., Professor of Plant Pathology and Botany
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 the Department of Anatomy

¹ Absent on leave, 1924-25.

² Died, March 31, 1923.

Dunham Jackson, Ph.D., Professor of Mathematics

¹Elizabeth Jackson, Ph.D., Assistant Professor of English

¹Albert Ernest Jenks, Ph.D., Professor of Anthropology, Chairman of the Department of Anthropology, and Director of the Americanization Training Course

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Winford P. Larson, M.D., Professor of Bacteriology and Immunology and Head of the Department of Bacteriology and Immunology

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Elias P. Lyon, Ph.D., M.D., Professor of Physiology and Director of the Department of Physiology

Jesse F. McClendon, Ph.D., Professor of Physiologic Chemistry

¹ Absent on leave, 1924-25.

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* Absent on leave, 1924-25.

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 Emerson G. Sutcliffe, Ph.D., Assistant Professor of English

¹ Absent on leave, 1924-25.

FACULTY

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 Frederic L. Washburn, M. A., Professor of Economic Vertebrate Zoology
 Marion Weller, B.A., Associate Professor of Textiles
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 Harold A. Whittaker, B.A., Assistant Professor of Preventive Medicine
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 Norman Wilde, Ph.D., Professor of Philosophy and Head of the Depart-
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 John J. Willaman, Ph.D., Associate Professor of Plant Chemistry
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 William Hodson, B.A., LL.B., Lecturer in Sociology
 Elizabeth S. Muenzinger, Ph.D., Lecturer in Sociology
 Arthur S. Nichols, B.S., Special Lecturer in Architecture
 Benjamin W. Palmer, M.A., LL.B., Lecturer in Political Science

¹ Absent on leave, fall quarter.

- Ira S. Allison, Ph.D., Instructor in Geology and Mineralogy
 Marion Andrews, M.A., Instructor in Economics
 R. Wilson Archibald, V.M.D., Instructor in Preventive Medicine and
 Public Health
 Amy E. Armstrong, M.A., Instructor in English
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 Clifford Bender, M.A., Instructor in English
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 Public Health
 Alfred Brandt, Technical Sergeant, Instructor in Military Science and
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 Carlotta M. Brown, Instructor in Millinery
 W. Horatio Brown, B.S., E.M., Ph.D., Instructor in Geology and Min-
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 J. William Buchta, M.A., Instructor in Physics
 Eula B. Butzerin, R.N., B.S., Instructor in Preventive Medicine and Public
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 John W. Dawson, B.S. in Arch., Instructor in Architecture
 Frances Kelley del Plaine, M.A., Instructor in English
 Grace E. Denny, B.S., Instructor in Physical Education for Women
 Ira T. C. Dissinger, B.A., Instructor in English
 Louise Dossdall, M.A., Instructor in Plant Pathology

Lynwood G. Downs, M.A., Instructor in German
Aubrey R. Dunkum, Staff Sergeant, Instructor in Military Science and Tactics
Christian Erck, Instructor in Cello
Robert D. Evans, M.S., Instructor in Bacteriology and Immunology
Majl Ewing, M.A., Instructor in English
George H. Fairclough, F.A.G.O., M.Mus., Instructor in Organ
Ralph H. Farmer, B.A., Instructor in Economics
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Margaret Gable, M.A., Instructor in English
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Gladys E. C. Gibbens, Ph.D., Instructor in Mathematics
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Vetta Goldstein, Instructor in Drawing and Design
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Beryl S. Green, B.A., Instructor in Bacteriology and Immunology
Lennox B. Grey, Ph.B., Instructor in English
Earl L. Griggs, M.A., Instructor in English
Robert A. Guinn, B.A., Instructor in Romance Languages
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
Richard Hartshorne, Ph.D., Instructor in Geography
Mildred Hartsough, Ph.D., Instructor in History
J. Wesley Hatcher, B.A., Instructor in Sociology
Joseph Havlicek, Regimental Commissary Sergeant, Instructor in Military Science and Tactics
Helen Hazelton, B.A., Instructor in Physical Education for Women
Edna F. Heidbreder, M.A., Instructor in Psychology
Arthur W. Henry, Ph.D., Instructor in Plant Pathology and Botany
Marshall Hertig, Ph.D., Instructor in Animal Biology
C. Russell Hoffer, M.S., Ph.D., Instructor in Sociology
Walter F. Hoffman, M.S., Ph.D., Instructor in Agricultural Biochemistry
Layton Holloway, M.A., Instructor in English
Calvin C. Hoover, B.A., Instructor in Economics
Thomas P. Hughes, Instructor in Mechanical Engineering
Ralph T. Huntley, B.A., Instructor in Orientation Courses
Emil W. Iverson, Instructor in Physical Education for Men
Frances Johnson, Ph.D., Instructor in Mathematics
Arnold V. Johnston, M.A., Instructor in Political Science

¹ Absent on leave, fall quarter.

- Blanche Kendall, Instructor in Music
 Helen M. Kepler, M.A., M.D., Instructor in Anatomy
 John Kierzek, M.A., Instructor in English
 Paul C. King, B.A., Instructor in Romance Languages
 Agnes Kolshorn, M.A., Instructor in Home Economics
 Richard L. Kozelka, M.A., Instructor in Economics
 Herbert W. Krieger, M.A., Instructor in Anthropology
 Frank Kuchinka, Instructor in Double Bass
 Otto F. Kuhlman, M.A., Instructor in Economics
 Carney Landis, Ph.D., Instructor in Psychology
 Walter M. Lauer, Ph.D., Instructor in Chemistry
 William C. Lawson, B.S., M.E., Instructor in Drawing and Descriptive
 Geometry
 Alex S. Levens, B.S., M.C.E., Instructor in Drawing and Descriptive
 Geometry
 Thomas S. Lovering, M.E. in Geol., Ph.D., Instructor in Geology and
 Mineralogy
 Katherine E. Ludgate, Ph.D., Instructor in Psychology
 Reuel I. Lund, C.P.A., M.A., Instructor in Accounting
 George A. Lundberg, M.A., Instructor in Sociology
 Olav K. Lundberg, M.A., Instructor in Romance Languages
 Duane McCracken, M.A., Instructor in Economics
 Blaine McKusick, LL.B., Instructor in Physical Education for Men
 John McWilliams, First Sergeant, Instructor in Military Science and
 Tactics
 Margaret E. Macgregor, M.A., Instructor in English
 John F. Markey, B.A., Instructor in Sociology
 Ernest S. Mariette, B.S., M.D., Instructor in Medicine
 Lillian M. Mayer, M.D., Instructor in Preventive Medicine and Public
 Health
 J. Lewis Maynard, B.A., Instructor in Chemistry
 Shirley P. Miller, M.A., Instructor in Anatomy
 Ella May Minert, Instructor in Voice
 John H. Moffett, M.E., Instructor in Mechanical Engineering
 Wayne L. Morse, M.A., Instructor in English
 Ernest Mylk, Private 1st Class, Spec. 4th Class, Instructor in Military
 Science and Tactics
 Ralph M. Nelson, B.S., Instructor in Forest Pathology
 Elizabeth Nissen, M.A., Instructor in Romance Languages
 Ruth Noer, B.S., Instructor in Home Economics
 Paul Oczipka, Ph.D., Instructor in German
 Fern Osbeck, B.S., Instructor in Home Economics
 Emily Payne, Ph.D., Instructor in Animal Biology
 Robert H. Perry, M.A., Instructor in English
 George M. Peterson, M.A., Instructor in Economics
 Harold A. Phelps, M.A., Instructor in Sociology
 Alvin E. Prottengeier, B.A., Instructor in German

Lloyd J. Quaid, B.S. in Elec. Eng., Instructor in Drawing and Descriptive Geometry

Karl Reuning, Ph.D., Instructor in German

Grace E. Richards, M.A., Instructor in English

William H. Richards, Instructor in Mechanical Engineering

Harlow C. Richardson, B.A., Instructor in English

Inez C. Richter, Instructor in Music

Fred E. Ringham, B.A., Instructor in Economics

Adolph Ringoen, Ph.D., Instructor in Animal Biology

Raymond C. Rose, M.S., Instructor in Plant Pathology

Harold Russell, B.A., B.L.S., Instructor in Library Methods

William J. Russis, M.A., Instructor in Romance Languages

W. Martin Sandstrom, B.A., M.S., Instructor in Agricultural Biochemistry

Landon A. Sarver, M.A., Instructor in Chemistry

Karl Scheurer, Instructor in Music

Robert F. Schuck, B.S. in E.E., Instructor in Drawing and Descriptive Geometry

James L. Seal, M.S., Instructor in Plant Pathology

Irene I. Sell, Ph.B., Instructor in Home Economics

Reginald C. Sherwood, M.S., Ph.G., Instructor in Agricultural Biochemistry

Katharine Sias, B.A., Instructor in Physical Education for Women

Walter R. Smith, B.A., Instructor in Physical Education for Men and Director of Intramural Athletics

David O. Spriestersbach, M.S., Instructor in Bacteriology and Immunology

Harold C. Sproul, M.A., Instructor in English

R. Rhodes Stabley, M.A., Instructor in English

William H. Stead, M.A., Instructor in Economics

Lawrence D. Steefel, Ph.D., Instructor in History

Clyde W. Stephens, Instructor in Piano

Henry N. Stephens, Ph.D., Instructor in Chemistry

Thomas E. Steward, B.A., Instructor in Journalism

Louise Stoddard, Instructor in Home Economics

Harry E. Strider, Technical Sergeant, Instructor in Military Science and Tactics

William W. Swanson, B.A., M.S., Instructor in Physiology

William J. Tannewitz, B.A., Instructor in Public Speaking

Harold T. Taylor, M.A., Instructor in Physical Education for Men

W. Bayard Taylor, B.A., Instructor in Economics

George A. Thiel, Ph.D., Instructor in Geology and Mineralogy

Gertrude I. Thomas, Instructor in Dietetics

Faith Thompson, Ph.D., Instructor in History

Ella A. M. Thorp, B.A., Instructor in Mathematics

Niels Thorpe, Instructor in Physical Education for Men

Arturo Torres-Rioseco, M.A., Certificado de Pedagogia, Instructor in Romance Languages

Arthur R. Upgren, B.A., Instructor in Economics

Warren C. Waite, M.A., Instructor in Agricultural Economics

George B. Watts, M.A., Instructor in Romance Languages
 Oscar Wesley, M.A., Instructor in Sociology
 Benjamin W. Wheeler, M.A., Instructor in History
 Henry J. Williams, Instructor in Harp
 David H. Willson, Ph.D., Instructor in History
 Carl W. Young, B.A., Instructor in Political Science
 Elmer E. Young, Instructor in Free-Hand Drawing
 Nina L. Youngs, B.A., Instructor in Economics
 Carle C. Zimmermann, M.A., Instructor in Sociology

ASSISTANTS AND SCHOLARS

ANIMAL BIOLOGY

Lennart G. Bryngelsson B.S., Teaching Assistant
 Walter Carter, M.S., Assistant
 Louis A. Fried, B.S., Assistant
 Marion Irwin, B.A., Assistant
 Lewis E. Nolan, Assistant
 Clarence E. Olson, B.S., Assistant
 Dietrich Smith, B.A., Assistant
 Hugh E. Wallace, B.S., Assistant

ANTHROPOLOGY

Margaret S. Huntley, M.A., Scholar

ASTRONOMY

Franz H. Rathmann, B.A., Assistant

BACTERIOLOGY AND IMMUNOLOGY

Halvor O. Halvorson, M.A., Teaching Fellow

BOTANY

Stuart J. Dunn, B.S., Assistant
 Harriet George, M.A., Assistant
 Raymond Landon, M.S., Assistant
 Ethel M. Mygrant, B.A., Assistant
 Jessie P. Rose, M.A., Assistant
 Nellie A. Thompson, B.A., Assistant and Technician
 Jerry A. Vacha, M.S., Assistant

ENGLISH

Elizabeth Bond, M.A., Scholar
 Elizabeth Craddick, B.A., Assistant
 Elizabeth Gile, B.A., Assistant
 Edith H. Jones, M.A., Scholar
 Medora E. D. Kinne, B.A., Scholar
 Howard Laramy, B.A., Assistant
 Elizabeth Mann, B.A., Scholar
 Henrietta C. Naeseth, M.A., Scholar

FACULTY

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Linnette I. Nelson, B.A., Scholar
Leone B. Nunan, B.A., Assistant
Wendell O. Rogers, B.A., Assistant

GEOLOGY

Ira Cram, M.A., Assistant
William A. P. Graham, B.A., M.S., Scholar
Leslie Miller, B.A., Scholar
Eunice Peterson, M.A., Assistant

GERMAN

Martin Bertram, M.A., Assistant
Bertha Bertsch, B.A., Assistant
Selma S. Gryce, M.A., Scholar
Esther Hendrickson, M.A., Assistant
Miriam Huhn, B.A., Scholar
Gina Wangsness, B.A., Assistant

GREEK

Dorothy B. Strong, B.A., Assistant

HISTORY

Gladys C. Blakey, M.A., Assistant
Grace Falck, M.A., Teaching Assistant
John Gruber, M.A., Scholar
Florence Hartwig, B.S., Teaching Assistant
Henrietta M. Larsen, M.A., Teaching Fellow
Harold McCumber, M.A., Teaching Fellow
Thorvald B. Madsen, B.A., Teaching Fellow
George F. T. Mayer, B.A., Scholar
Helen Parker Mudgett, B.A., Assistant
Louise Nixon, M.A., Teaching Fellow
Stanley Perry, B.A., Teaching Fellow
Alice F. Tyler, M.A., Assistant
Lyder Unstad, M.A., Assistant
Nelle Young, M.A., Assistant

HUMAN PHYSIOLOGY

Joseph T. King, B.S., Teaching Fellow
Arthur G. Mulder, Teaching Fellow
Alice Rupp, B.A., Teaching Fellow
Maurice B. Visscher, B.A., M.S., Assistant

JOURNALISM

Genevieve Boughner, B.A., Assistant

LATIN

Emily A. Babcock, M.A., Assistant

MATHEMATICS

Russell L. Grossnickle, M.A., Teaching Assistant
 Gilbert N. Trytten, B.A., Teaching Assistant
 William H. McEwen, M.S., M.A., Assistant
 Cecil Phipps, M.A., Assistant

MUSIC

Mary Malcolm, B.S., Assistant

PHYSICAL EDUCATION FOR MEN

Max H. Herseth, Assistant

PHYSICS

Arthur J. Ahearn, B.A., Teaching Assistant
 Earl N. Clarke, B.S., Teaching Assistant
 David L. Cook, B.A., Assistant
 Iwao Fukushima, M.A., Assistant
 Louis P. Granath, B.A., Assistant
 Herbert R. Grumann, M.E., Assistant
 William B. Haliday, Assistant
 Sigmund Hammer, B.A., Teaching Assistant
 Elmer Hutchinson, M.S., Teaching Assistant
 Ernest J. Jones, B.S., Teaching Fellow
 Benjamin M. Knutson, B.A., Teaching Fellow
 John Kralovec, B.A., Assistant
 Louis Maxwell, B.A., Assistant
 Walter M. Nielsen, B.S., Teaching Fellow
 Carl E. Nurnberger, B.A., Assistant
 Everett D. Wells, B.S., Assistant

POLITICAL SCIENCE

Sherman Anderson, B.A., Scholar
 Asher N. Christensen, B.A., Assistant
 Herbert W. Hess, M.A., Assistant
 Bryce E. Lehman, B.A., Assistant
 Walter S. Lundeen, LL.B., Assistant
 Nathan Schocket, B.A., Assistant
 Byron M. Smith, B.A., Scholar
 Alex Tollefson, M.A., Scholar

PSYCHOLOGY

Grace Arthur, Ph.D., Teaching Fellow
 Josephine Baldwin, B.A., Teaching Assistant
 Ruth Gullette, M.A., Teaching Fellow
 Ella B. Osbourn Heim, B.A., Teaching Fellow
 Ruth Hubbard, B.A., Teaching Assistant
 Carlyle Jacobsen, B.A., Teaching Assistant
 Theos A. Langlie, B.A., Teaching Assistant

FACULTY

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Marne Lauritsen, M.A., Teaching Fellow
Grace O'Brien, B.A., Scholar
Agnes Thorson, B.S., M.A., Teaching Fellow

ROMANCE LANGUAGES

Eleanor V. Cederstrom, M.A., Assistant
Lucille Franchère, B.A., Teaching Fellow
Jennie May McMullen, M.A., Teaching Fellow
J. Henry Owens, B.A., Teaching Assistant
Rosa Seeleman, B.S., Teaching Fellow
Marian H. Wilson, B.S., Teaching Assistant

SCANDINAVIAN

Gustav S. Fryklind, M.A., Scholar

SOCIOLOGY

Maryesther Meyer, B.A., Scholar
Elizabeth C. Hayes, B.A., Scholar
Roscoe H. Larson, B.A., Assistant
Franklin R. McKeever, M.A., Teaching Assistant
Oscar M. Mehus, M.A., Teaching Assistant
Ernest J. Meili, M.A., Scholar
Henry C. Mohler, B.A., Teaching Fellow
Jessie Ravitch, M.A., Scholar

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 at least the Junior College requirements of the College of Science, Literature, and the Arts, or of some other approved college at the University of Minnesota or elsewhere, during which time an introductory course in general psychology shall have been pursued.

b. The College of Education grants 90 credits to graduates of the advanced graduate course of Minnesota state teachers' colleges.

c. In special subjects such as art education, physical education, public school music, etc., where a four-year curriculum is provided, students may register in the College of Education in the freshman year, provided they have completed the requirements for admission to the University.

Admission as unclassified students.—The College of Education grants to graduates of the advanced Latin and the advanced English courses of the Minnesota state teachers' colleges, 63 credits.

Teachers of experience who are unable to meet the regular requirements for admission are admitted to the College of Education as unclassified students.

Admission with advanced standing.—Graduates of the three-year course in the state teachers' colleges of Minnesota may receive not more than 112½ credits in the College of Education.

Residence requirements.—The minimum term of residence in the College of Education is two years beginning as soon as the Junior College requirements have been fulfilled.

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.

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.

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 should register with the bureau during the first quarter of the senior year. Complete instructions and blanks may be secured at the office of the dean. No fees are charged.

Bureau of Educational Research.—The College of Education conducts a Bureau of Educational Research for the purpose of promoting investigations by faculty and students in problems of education. The bureau is under the direction of the dean of the college and the members of the

faculty co-operate as their several interests dictate. Through the bureau opportunity is given for co-operation with public schools in studies bearing upon problems of school administration, classroom instruction, and related matters. The bureau is responsible for the publication of a series of studies under the general title of Educational Monographs.

Graduate work in education.—Graduate work in education leading to the degree of master of arts or doctor of philosophy may be pursued in the Graduate School. Students who desire to undertake graduate work with education as a major must have had at least 6 credits in psychology, and, in addition to this, a total of not less than 12 credits in education. Students who desire to undertake graduate work with education as a minor must have at least 6 credits in psychology, and, in addition to this, a total of not less than 6 credits in education.

All courses bearing numbers of 100 and above are open for credit to graduate students. Before attempting to make out their programs, graduate students in education should consult the dean of the College of Education and the dean of the Graduate School.

Graduate students who are candidates for advanced degrees are advised to take Course 116-117 or 116a and Course 208 unless they have previously had the equivalent of these courses. Courses bearing numbers 200 and above are open to graduate students only.

Students working for a Master's degree with a major in school administration will be required to take the following courses unless the equivalent has been taken as undergraduate work.

Education 55—Educational Psychology, no credit

Education 208—Methods of Educational Research, 2 credits

Education 111—Educational Diagnosis, 3 credits

Education 116-117 or 116a—Statistical Methods, 3 or 4 credits

Graduate work may be pursued during summer sessions. The Master's degree may ordinarily be completed in four summer sessions. For full statement of regulations, consult the Graduate School bulletin.

Credits and honor points.—The Senate regulations governing the system of marks is as follows:

1. That there shall be four grades, A, B, C, and D, representing varying degrees of achievement, which shall be acceptable for the completion of a single course; but this definition shall not be construed as preventing any college or school from setting special standards of performance as a condition of registration in particular courses of study, of admission to the college or school, of promotion, of counting work toward a degree, or of continued residence in the college or school. Work merely acceptable for the completion of all his single courses of study does not constitute a satisfactory record for a student when his college specifies higher requirements for any purpose.

2. There shall be two grades indicating work of distinctly unsatisfactory quality. These grades shall be known as E (condition), which may be removed by examination or other means stipulated by the faculty of the college or school concerned, and F (fail) which may be removed only by a repetition of the work in the course, or, in exceptional cases, by examination by permission of the faculty concerned.

3. There shall be a Grade I (incomplete), which shall indicate that a student, for reasons satisfactory to the instructor in charge, shall have been unable to complete the work of the course. This grade shall be given only when the work already done has

been of quality acceptable for the completion of the course. Any student receiving this grade shall be given an opportunity to complete the said course within the first thirty days of his next quarter in residence.

4. There shall be a symbol, T (transferred), indicating the transfer of credit from another institution or from one college to another of the University of Minnesota. This symbol shall be provisional and subject to final evaluation by the faculty of the college or school to which the student is transferred.

The amount of work pursued by a student is estimated in credit hours; the quality or grade of his work, in honor points.

A *credit hour* is one hour per week of recitation or lecture work extending throughout one quarter, or three hours per week of laboratory work through one quarter. It is assumed that each credit hour will demand on the average three hours a week of the student's time for recitation or lecture, one hour in class and two hours of preparation; for laboratory courses, three hours in the laboratory.

Honor points are computed as follows: each credit hour with the grade of A entitles the recipient to 3 honor points; each credit hour with the grade of B entitles the recipient to 2 honor points; each credit hour with the grade of C to 1 honor point; each credit hour with the grade of D to no honor points. Illustration: A student completing a one-quarter 3-credit course and receiving the grade of A would be entitled to 9 honor points; if receiving the grade of B, to 6 honor points; if receiving the grade of C, to 3 honor points; if receiving the grade of D, to no honor points.

The degree of bachelor of science.—Students graduating from the College of Education will receive the degree of bachelor of science.

Candidates for this degree may major in any department listed on page 24.

Graduation with distinction.—The degree of bachelor of science *with distinction* is granted to graduates of this college who have attained special excellence in scholarship as evidenced by an average grade of "B." Candidates must be recommended to the faculty for the degree with distinction by their major department on the basis of scholarship and the degree of advancement of the courses pursued. The faculty has the final authority in making the award.

COURSES OF STUDY

GENERAL REQUIREMENTS AMOUNT AND GRADE OF WORK

a. During his entire course the student must earn (1) 180 credit hours 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 hour the number 180 is diminished by one, but no student will be recommended for graduation who has not completed all of the courses required in his particular curriculum and who has not satisfied all the requirements for a teacher's certificate; (2) $1\frac{1}{2}$ honor points per credit hour in his major subject; and (3) an average of 1 honor point per credit hour in all other courses pursued during the junior and senior years.

b. Fifteen credit hours are regarded as the usual load. Students who wish to register for more than seventeen hours must show a record of $1\frac{1}{2}$ honor points per credit hour 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 exceed 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.

Honor points are computed on the basis of one and one-half times the number of credit hours 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.

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. 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:

Administration and Supervision	Latin
Agriculture	Mathematics
Americanization	Natural Science
Animal Biology	Norwegian
Art Education	Physical Education for Men
Botany	Physical Education for Women
Chemistry	Public School Music
Commercial subjects	Physics
English	Political Science
French	School Psychologist
Geography	Social Studies
German	Spanish
High School Teacher-Training	Swedish
History	Teaching Subnormal Children
Home Economics	Trade and Industrial Education

All students without teaching experience, desiring a University teacher's certificate will be required to comply with the requirements of the prescribed curriculum for the University teacher's certificate in a secondary school subject, or the specific requirements of the special curricula. Such students will also be required to complete a two years' course leading to the degree of bachelor of science.

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.

*Prescribed Course of Study for University Teacher's Certificate
in a Secondary School Subject¹*

The College of Education has adopted the following prescribed course of study, totaling 25 credits, for the University teacher's certificate, and for the degree of bachelor of science.

1	Brief Course in History of Education	5 credits
	or	
101-102-103	History of Education	9 credits
3	Educational Sociology	3 credits
55	Elementary Psychology	3 credits
15	Technique of High School Instruction.....	3 credits
65	The High School	3 credits
16	Practice Teaching	5 credits
	Special Methods	at least 3 credits

The following courses must be taken in the order named, each being regarded as a prerequisite to all the courses which follow it:

Educational Psychology 55	Special Methods
Technique of Teaching 15	Practice Teaching 16

In addition to the teachers' course in the subject in which the student wishes to do practice teaching, he will be required to satisfy all courses required by the subject-matter department concerned as prerequisite to the

¹ These requirements do not apply to students who are registered in any of the special curricula in the College of Education.

teachers' course. (See departmental statements.)

To avoid overcrowding in practice teaching in the spring quarter all students who have completed the prerequisite courses are urged to apply for admission to practice teaching in the fall and winter quarters.

PRESCRIBED COURSE FOR UNIVERSITY TEACHER'S CERTIFICATE IN ADMINISTRATION AND SUPERVISION

It is desirable that prospective superintendents and principals of graded schools, before entering upon their duties, shall have had courses in school administration and school supervision in some recognized normal school or college. Students who wish to qualify for a certificate in administration and supervision will be required to earn 37 credits as follows:

Required courses, totaling 28 credits, include: Education 111, 116-117 or 116a, 160-161-162,* 124-125-126, †144-135-136. Elective credits, totaling 9, selected from the following: Ag. Ed. 153-154-155, Education 3, 15, 55, 65, 106-107-108, 113, 115, 119, 123, 138-139, 164, 167-168, 173, 174, 175, 180, 184-185-186, 201-202-203, 205-206-207, 218-219-220, or other courses approved by the adviser. For suggested curriculum, consult pages 25-54.

SPECIALIZED CURRICULA ADMINISTRATION AND SUPERVISION

Major Advisers: L. J. Brueckner, Fred Engelhardt, Earl Hudelson,
L. V. Koos

CURRICULUM FOR THE FIRST AND SECOND YEARS IN THE JUNIOR COLLEGE FOR STUDENTS PREPARING TO BE

- a. Superintendents and elementary school principals
- b. Junior and senior high school principals
- c. Supervisors of instruction in elementary schools.

* Education 123 and 113 should be substituted for 161-162 by students specializing in High School Administration.

† Education 164 and 167 should be substituted for 125 and 126 by students specializing in High School Administration.

For Administration and Supervision see page 25.

For Agriculture see page 29.

For Americanization see page 30.

For Art Education see page 32.

Commercial Training (See Department of Economics)

For High School Normal Training see page 32.

For Home Economics see page 34.

For Natural Science see page 36.

For Occupational Therapy see page 39.

For Physical Education for Men see page 41.

For physical Education for Women see page 43.

For School Psychologist see page 46.

For Public School Music see page 47.

For Social Studies see page 48.

For Sociology see page 50.

For Teaching of Subnormal Children see page 51.

For Trade and Industrial Education see page 52.

For Visiting Teachers see page 54.

COLLEGE OF EDUCATION

FIRST YEAR—JUNIOR COLLEGE

<i>First Quarter</i>		<i>Second Quarter</i>		<i>Third Quarter</i>	
	Credits		Credits		Credits
Rhetoric 1	5	Rhetoric 1	5	Rhetoric C	5
History 1	5	History 2	5	Political Science 1	5
Animal Biology 1	5	Animal Biology 2	5	French or German 1	*5
Military Science		Military Science		Military Science	
Physical Education		Physical Education		Physical Education	

SECOND YEAR—JUNIOR COLLEGE

	Credits		Credits		Credits
Public Speaking	3	Public Speaking	3	Public Speaking	3
Psychology 1	3	Psychology 2	3	Sociology 1	5
Economics 3	5	Economics 4	5	Journalism 61	
French or German 2	5	French or German 1	5	French or German	5
Military Science		Military Science		Military Science	
Physical Education		Physical Education		Physical Education	

SENIOR COLLEGE CURRICULA

1. Curriculum for school superintendents and elementary school principals
2. Curriculum for elementary school general supervisors.
3. Curriculum for high school principals.

I. CURRICULUM FOR SCHOOL SUPERINTENDENTS AND ELEMENTARY SCHOOL PRINCIPALS

JUNIOR YEAR

<i>First Quarter</i>		<i>Second Quarter</i>		<i>Third Quarter</i>	
	Credits		Credits		Credits
Ed. 55, Educational Psychology	3	Ed. 3, Educational Sociology	3	Ed. 111, Educational Diagnosis	3
Ed. 116, Ed. Statistics	2	Ed. 117, Ed. Statistics	2	Ed. 167, Junior H.S.	3
Ed. 134, Mental Tests	2	Ed. 135, Mental Tests	2	Ed. 136, Mental Tests	2
Pol. Sci. 11f, Municipal Government	5	Pol. Sci. 7w	5	Elective	8
Econ. 191, Public Finance	3	Econ. 192, Public Finance	3		
	15		15		16

SENIOR YEAR

<i>First Quarter</i>		<i>Second Quarter</i>		<i>Third Quarter</i>	
	Credits		Credits		Credits
Ed. 160f, Elem. School Supervision	2	Ed. 161w, Elem. School Supervision	2	Ed. 162s, Elem. School Supervision	2
Ed. 124f, School Administration	3	Ed. 125f, City School Administration	3	Ed. 126s, City School Administration	3
Ed. 119, Elem. School Curriculum	3	Ed. 174w, Pub. School Finance	3	Ed. 175s, City School Finance	3
Elective	8	Ed. 115, Practice in Supervision	3	Ed. 123 or Ed. 164f, High School Supervision	3
	16	Ind. 171, Administration of Ind. Ed.	2	Elective	5
		Elective	3		
			16		16

* Twenty credits must be secured in either French or German.

2. CURRICULUM FOR ELEMENTARY SCHOOL GENERAL SUPERVISORS

JUNIOR YEAR		
<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Credits	Credits	Credits
Ed. 55, Educational Psychology 3	Ed. 3, Educational Sociology 3	Ed. 111, Educational Diagnosis 3
Ed. 134f, Mental Tests and Mental Diagnosis. 2	Ed. 44, Teaching of Arithmetic 2	Ed. 119s, Elem. School Curriculum 3
Ed. 118f, Problems of Junior High School English 2	Ed. 135w, Mental Tests and Mental Diagnosis. 2	Ed. 136s, Mental Tests and Mental Diagnosis 2
Ed. 45f, Social Science for Junior High School 2	Ed. 4w, Children's Literature 2	Ed. 103s, History of Modern Elementary Education 3
Elective 6	Ed. 12, Participation in Teaching with Special Methods 3	Ed. 13, Practice Teaching with Special Methods 3
	Elective 3	(For 3 hrs. credit)
—	—	Elective 2
15	15	16

SENIOR YEAR		
<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Credits	Credits	Credits
Ed. 160, El. School Supervision 2	Ed. 161, El. School Supervision 2	Ed. 162, El. School Supervision 2
Ed. 124f, Educational Administration 3	Ed. 125w, City School Administration 3	Ed. 126s, City School Administration 3
Ed. 178f, School Surveys 3	Ed. 179w, School Surveys 3	Ed. 168w, The Junior High School 2
Ed. 116 or 116a, Statistical Methods 2 or 3	Ed. 167w, The Junior High School 2	Ed. 115s, Practice Supervision 3
Elective 5	Ed. 117, Statistical Methods 2	Elective in Teaching of El. Sch. Subjects. . . . 3
—	Elective 3	Elective 2
15 or 16	15	15

3. CURRICULUM FOR HIGH SCHOOL PRINCIPALS

JUNIOR YEAR		
<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Credits	Credits	Credits
Ed. 55, Educational Psychology 3	Ed. 3, Educational Sociology 3	Ed. 111, Educational Diagnosis 3
Ed. 116, Educational Statistics 2	Ed. 117, Educational Statistics 2	Ed. 167, Junior High School 3
Pol. Sci. 11, Municipal Government 5	Pol. Sci. 7, State Government 5	Ed. 15, Technique 3
Courses in teaching major or minors or elective 5	Courses in teaching major or minors or elective 5	Courses in teaching major or minors or elective 6
—	—	—
15	15	15

COLLEGE OF EDUCATION

SENIOR YEAR		
<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Credits	Credits	Credits
Ed. 124, Educational Administration 3	Ed. 164, Problems of H.S. Administration.. 3	Ed. 123, Supervision of H.S. Instruction 3
Ed. 134, Mental Tests.. 2	Ed. 135, Mental Tests.. 2	Ed. 136, Mental Tests.. 2
Course in Special Methods 3	Ed. 16, Practice Teaching 5	Courses in teaching major or minors or elective 10
Ed. 113, High School Curriculum 3	Ind. 171, Administration of Industrial Ed. 2	
Courses in teaching major or minors or elective 4	Ed. 102, History of Modern Secondary and Higher Education 3	
—	—	—
15	15	15

This curriculum is to be taken with or without work meeting the requirements of the University teacher's certificate. If taken without, it carries with it the supervisor's certificate with special reference to the high school principalship. The student taking the curriculum and not at the same time a candidate for the University teacher's certificate is, as may be seen in the accompanying schedule of requirements, permitted to elect that portion of his work not definitely prescribed. When taken with the work meeting the requirements of the certificate, the student will fill the elective portions of the curriculum with courses that are prescribed in the major or minor subjects in which he desires certification. With work taken in junior college years it will be possible for the student to complete a major or two minors by the time of receiving his degree. In some respects for the principal the completion of two minors is preferable to the completion of a single major.

COURSES FOR THE UNIVERSITY CERTIFICATE FOR ELEMENTARY SCHOOL TEACHERS

Students who have been graduated from a two-year normal training course or its equivalent and who wish to work for the Bachelor's degree in education and the University teacher's certificate for elementary school teachers may enroll in the College of Education. The courses listed below as required presuppose a full two-year normal training course.

REQUIRED COURSES		Credits
Ed. 53, Educational Psychology		3
Ed. 111, Educational Diagnosis		3
Ed. 3, Educational Sociology		3
Ed. 42, Fundamental Educational Theories Related to Elementary Instruction		2
Ed. 119-120, Elementary School Curriculum		4
Ed. 103, History of Modern Elementary Education		3
Ed. 160, Elementary School Supervision		3
Ed. 124, Educational Administration		3
Ed. 116, Educational Statistics		2
Ed. 4, Children's Literature		3

(Seven hours to be elected from courses listed below)

Ed. 168, The Junior High School	3
Ed. 44, The Teaching of Arithmetic	2
Ed. 43, The Teaching of English in the Elementary School.....	2
Ed. 45, Teaching of History and Geography	2
Ed. 181su, Technique of Elementary Instruction	3
Special methods courses in elementary and junior high school teaching	—
Total required credits	36
18 credits in each of two of the following fields or such others as may be approved: English, literature, history, languages, political science, science, mathematics, geography	36
General electives	18
Total credits required for certificate.....	90

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.

FRESHMAN AND SOPHOMORE COURSES

The courses during the freshman and sophomore years are the same as are required of all agriculture students in the College of Agriculture. Every student should, if possible, complete these subject courses before the end of the sophomore year. Any subjects that cannot be taken in the freshman or sophomore years must take precedence the following year. Care should be taken in registration to give precedence to courses offered only one quarter. See bulletin, College of Agriculture, Forestry, and Home Economics.

JUNIOR AND SENIOR COURSES

(Required for University teacher's certificate in agriculture)

For the junior and senior years the following curriculum has been approved by the College of Agriculture, Forestry, and Home Economics, and the College of Education and is required of all students who are candidates for the University teacher's certificate in agriculture.

JUNIOR YEAR

SENIOR YEAR

Fall Quarter

- Agr. Ed. 21f, Vocational Education, 3
 Agr. Biochem. 15f,s, Principles of Animal Nutrition, 3 (Agr. Biochem. 7-8)
 Agron. 121f, Cereal Crops, 3 (Agron. 1)
 Agron. 131f,w, Principles of Genetics, 3 (Bot. or An. Biol. 9 cred.)
 An. Husb. 11f, Types and Breeds of Livestock, 3 (An. Husb. 10)
 Hort. 6f, Fruit-Growing, 3 (May be omitted if completed as a part of the general requirements)
 Electives, 0 or 2
- Agr. Ed. 41f,w,s, Apprentice Teaching, 2 (See tabular statement)
 Agron. 102f,w, Farm Management II: Organization, 3 (Agron. 1, Agr. Econ. 6, Soils 4)
 Dy. Husb. 6f, Judging Dairy Cattle, 1 (An. Husb. 10)
 Dy. Husb. 101f, Milk Production, 5 (Dy. Husb. 1)
 Agr. Ed. 42f,w,s, Teaching, 3 (See tabular statement)
 Agr. Ed. 75f,s, Visual Presentation, 3 (Agr. Ed. 11)

Winter Quarter

- Agr. Ed. 11f,w,s, Principles of Vocational Education, 3
 Agron. 122w, Corn and Potato Crops, 3 (Agron. 1)
 An. Husb. 6w, Livestock-Feeding, 5 (Agr. Biochem. 15)
 An. Husb. 12w, Types and Breeds of Livestock, 3 (An. Husb. 11)
 Ent. 3f,w, Economic Entomology, 3 (An. Biol. 16)
- Agr. Ed. 154f,w, Rural Education and Community Life 3 (Agr. Ed. 11)
 Agr. Econ. 84w, Prices of Farm Products, 3 (sr. class. or 13 cred. in econ. and farm mgt. and 5 cred. in other soc. sciences)

Or

- Sociology 14f,w,s, Rural Sociology, 3 (sr. class. or Sociol. 1)
 Agron. 103w,s, Farm Management II: Operation, 3 (Agron. 102)
 Vet. 9w, Veterinary Studies, 3
 Pl. Path. 1f,w, Plant Pathology, 5 (Bot. 9 cred.)

Spring Quarter

- Agr. Ed. 131f,w,s, Methods in Teaching High School Agriculture, 5 (See tabular statement)
 Agr. Econ. 85f,s, Principles of Marketing, 3 (Agr. Econ. 6)
 Agron. 11s, Farm Machinery, 3
 Agron. 123s, Forage and Fiber Crops, 3 (Agron. 1)
 Hort. 32s, Vegetable-Growing, 3. (May be omitted if completed as a part of the general requirements)
 Electives, 0 or 3
- Agr. Ed. 151w,s, Organization and Management, 5 (Agr. Ed. 11, 21)
 Agr. Eng. 40f,s, Mechanical Training, 3
 Vet. 10s, Veterinary Studies, 3 (Vet. 9)
 Electives, 6

AMERICANIZATION TRAINING

GENERAL STATEMENT

Students registering in this course will be required to have completed the freshman and sophomore years in the course in Americanization training or their equivalent in the College of Science, Literature, and the Arts. All students desiring the University teacher's certificate for Americanization work will be required to secure credits in the following courses in the College of Education. Such students must also be registered in the College of Education.

COURSES OF STUDY

JUNIOR STUDIES

REQUIRED	CREDITS	ELECTIVES
American People—Older Immigrants from Europe	3	Supervised Americanization Work Immigrant Woman
Newer Immigrants from Europe.....	3	Race Leaders and Programs
Americanisms and Assimilation.....	3	Labor Problems
Americanization Methodology .....	..	Statistics
Methods of Americanization	3	Elementary Dietetics
126, Organization of Americanization Work	3	Housing Problems
Ed. 3, Educational Sociology	3	Home Management
Ed. 55, Educational Psychology	3	Social Psychology
Ed. 15, Technique of Teaching.....	3	History of Education
or		
Am. 127, Technique of Teaching Adults..	3	
General Economics	5, 5	Physical Anthropology
Aliens' Viewpoints: special lectures by race leaders	0	Political and Social Ethics (10 credits in any social science; jr., sr., grad.)

SENIOR STUDIES

REQUIRED	CREDITS	ELECTIVES
American Negro	3	Negro and Immigrant Adjustments
Government and the Immigrant.....	4	Slavic Culture
Race Leaders and Programs (If not previously elected)	3, 3	Slavic Oral Language
Ed. 16, Practice Teaching.....	5	Genetics and Eugenics
or substitute		Social Statistics
Supervised Americanization Work.....	3, 3, 3	Seminars in Intensive Race Studies
Teachers' Course .....	..	Socialism
or substitute		Child Welfare
Am. 125, Methods of Americanization Work	3	Philippine Peoples
		Municipal Problems
		Mental Diagnosis

Students desiring a special certificate to teach in home workers' classes will be required to take the following additional courses:

No.	Credits	Title	Offered to	Prerequisite courses
70w	3	Food Preparation	Soph., jr., sr.	Gen. zool.; gen. chem., desired
71s	3	Elementary Dietetics	Soph., jr., sr.	70, gen. physiol. desired
72f	3	Home Management Problems	Jr., sr.	70, 71, gen. econ. or parallel

Students desiring to secure a special certificate to teach in the evening classes or community center classes will be required to take the following additional courses:

FOR MEN	FOR WOMEN
See courses in Physical Education for Men	See courses in Physical Education for Women
Vocational Education, Civics	

COLLEGE OF EDUCATION

ART EDUCATION

Major Adviser: Ruth Raymond

The following special curriculum in art education qualifies the student to teach art in grades or high schools, and to supervise art instruction. Art courses are open at the beginning of the freshman year to those registering in the College of Education.

1. Major subject—art, including the following minimal requirements:

- 18 credits in design
- 18 credits in drawing
- *12 credits in handicrafts
- † 5 credits in art history and appreciation
 - 3 credits in teacher's course in art
 - 6 credits in practice teaching

2. Minor subjects—education, with the following requirements:

- 3 credits in educational psychology
- 5 credits in history of education
- 3 credits in educational sociology
- 3 credits in technique of teaching
- 3 credits in secondary education

See Teacher's Course and Practice Teaching above.

3. Minor subjects—18 (minimal number) credits chosen from any department whose courses are accredited in the College of Education.

4. Required supporting courses:

- 15 credits in rhetoric
(The 9-credit course in rhetoric for technical students may be substituted)
- 6 credits in general psychology
- 3 credits in textiles
- 10 credits in history

If high school history of ancient, medieval, and modern periods is not offered for entrance)

- 10 credits in science

(If minor subject is home economics or trade education)

5. Electives, which are recommended, to be in a modern language, a science, or a social science, if the minor subject has not involved one of these departments.

HIGH SCHOOL NORMAL TRAINING

Major Adviser: George Selke

The special curriculum for persons preparing to teach normal training in Minnesota high schools is organized from the beginning of the freshman year. Students may begin on this curriculum upon entrance to the University. Students will find in this curriculum the desirable courses necessary to complete their four-year course leading to the degree.

Courses 42, 43 listed in the curriculum outlined below will be found described under the Department of Theory and Practice of Teaching in

* Courses 10f and 11w in Trade and Industrial Education (see page 73) may be chosen to fulfill a portion of this requirement.

† These credits may be chosen from the following courses: Art Ed. 70, Art Ed. 53, 54, Home Economics 51, and Greek 42, 43, 44, 45.

this bulletin, page 71. All other courses are described under the proper departmental statements in the bulletins of the College of Science, Literature, and the Arts, and the College of Education.

Freshman Year

FALL QUARTER			WINTER QUARTER			SPRING QUARTER		
No.	Title	Credits	No.	Title	Credits	No.	Title	Credits
I	Animal Biology ..	5	2	Animal Biology ..	5	4	Human Physiol...	5
A	Fresh. English...	5	B	Fresh. English...	5	C	Fresh. English...	5
29fT	Fundamental Prin. of Design	2	A.E.1	Fundamental Prin. of Design	2	E.E.2	Fundamental Prin. of Design	2
49	Phys. Ed.	0	50	Phys. Ed.	0		Phys. Ed.	0
	Elective	4		Elective	3		Elective	3

Sophomore Year

I	Gen. Psych.	3	2	Gen. Psych.	3	1	Introduction to Sociology	5
4I or 1I	Pub. Speak.	3	42 or 12	Pub. Speak.	3	43 or 13	Pub. Speak.	3
I	Exposition Hist. of Modern World	5	2	Description Hist. of Modern World	5	1	Narration Am. Govt.	5
35T or 37T or 38T	Art Education ...	2	32	Personal Hygiene.	3	or 30T	Principles of Geography Art Ed.	2
	Phys. Ed.	0		Phys. Ed.	0		Phys. Ed.	0
	Elective	3		Elective	3			

Junior Year

44	Am. Lit.	3	45	Am. Lit.	3	8	Shakespeare	4
5	American Hist. ..	5	6	American Hist. ..	5	42	Practice Teach. with Special Methods	5
43	Play and Play- ground	1	66,67	Interpret. Danc...	2		Ed. Diag.	3
	Elective	5		Elective	6	11I 44	Play and Play- ground	1
							Elective	3

Senior Year

FALL QUARTER			WINTER QUARTER			SPRING QUARTER			
No.	Title	Credits	No.	Title	Credits	No.	Title	Credits	
119	Elemen. School Curriculum ...	3	161	Superv. of Elem. Sch. Instruc. ..	2	162	Superv. of Elem. Sch. Instruc. ..	2	
43	Field Prob. in H. S. Training Departments ..	3	3	Educational Sociology	3	14	Rural Sociology..	3	
59	Music Apprecia- tion	1	60	Music Apprecia- tion	1	61	Music Apprecia- tion	1	
38f	Art. Ed. Pottery..	2	60,61	Art Ed.—Comm. and Indus. De- sign	2	5	General Econ. ...	3	
60	Minor Sports Technique	1		61	Minor Sports Technique	1	525	Art Hist. and Appreciation ...	2
40	Child Training ...	3		Elective	3	164	Fundamentals of Agriculture ...	3	
				Suggested elective Hygiene of the Family			Elective	3	
							Suggested elective Food Preparation in Relation to Social Work		

HOME ECONOMICS EDUCATION

Major Adviser: Wylle B. McNeal

For the junior and senior years the following courses have been approved by the College of Agriculture, Forestry, and Home Economics and by the College of Education and all students who are candidates for the University teacher's certificate are required to pursue one of the following curricula.

Such students become registrants in both colleges during the junior and senior years but register for their freshman and sophomore work in the College of Agriculture, Forestry, and Home Economics. Every student who expects to teach home economics and who expects to obtain the University endorsement for a certificate must meet the following requirements: (A) a minimum of 22 credits in professional work, (B) the special scholarship requirement, (C) home practice in foods and cookery, and (D) completion of all of the subjects listed under any one of the 5 lines of specialization described below.

REQUIREMENTS FOR THE UNIVERSITY TEACHER'S CERTIFICATE
IN HOME ECONOMICS

Students in the Home Economics Course desiring to qualify as teachers must comply with the following requirements:

A. Completion of 22 credits of *professional work*, including

JUNIOR YEAR		SENIOR YEAR
Ed. Psych. 55f,w,s. Ed. Psych., 3 (Psych. 1-2) or Agr. Ed. 11f,w,s. Prin- ciples of Vocational Education, 3.		H.E. Ed. 46, 47, 48, or 49f,w,s, Observa- tion and Teaching, 8 (H.E. Ed. 42)
H. E. Ed. 40f, Child-Training, 3 (Prev. Med. 52 or parallel), Psych. 1-2.		
Hist. and Philos. of Ed. 5s, Public Ed. in U.S. 3 (Psych. 1-2)		
H. E. Ed. 42f,w,s, Special Methods of Teaching Home Economics, 5 (H.E. 13, 22, Psych. 1-2, Ed. Psych. 55 or Agr. Ed. 11)		

B. Satisfaction of special *scholarship requirement*

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

C. Home practice in foods and cookery following courses H.E. 21 and 22 is required as a prerequisite to Observation and Teaching. A conference with a Home Economics instructor should precede this work and an examination must be passed.

D. Completion of one of the following subject-matter courses:

GENERAL TEACHERS' CURRICULUM

Junior Year

- Econ. 1w,s, Principles of Economics, 5.
 H. E. 37f,s, Health Care of the Family (Bact. 51) Physiol. 4.
 H. E. 52f,w,s, Art History and Appreciation, 3 (H. E. 51).
 H. E. 53f,w,s, Advanced Design, 4 (H. E. 51).
 Rhetoric 22f,w,s, Public Speaking, 5 (Rhet. 3).
 H. E. 23f,w, Nutrition I, 5 (H. E. 2, Bact. 51, Agr. Biochem. 3).
 H. E. 108f,w,s, Nutrition II, 5 (H. E. 23).
 2. *Electives*.—Enough electives should be selected to make up, 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

- H. E. 17f,w,s,su, Advanced Clothing Construction, 3 (H. E. 13, 52, 53).
 H. E. 36f,w,s, Home Management: Operation and Maintenance, Lect., 3 (H. E. 22).
 H. E. 35f,w,s, Home Management: Operation and Maintenance, Laboratory, 6 (H. E. 22, Home Practice in Foods and Cookery, Prev. Med. 52, and H. E. 40 prereq. or parallel, 34 parallel).
 H. E. 45w,s, Home Economics Survey, 2.
 H. E. 103f,w,s, Dietetics, (H. E. 108).
 H. E. 123w,s, Clothing Economics, 2 (H. E. 12, Econ. 5).
 H. E. 111f,w,s, Home Management: House Planning and Equipment, 5 (H. E. 52, 53).
 Econ. 121, Economics of Consumption, 3 (Econ. 5).

TEACHERS' CURRICULUM IN FOODS AND HOME MANAGEMENT

Students specializing in this course may omit the following subjects from the Teachers' Curriculum in Home Economics:

Senior Year

- H. E. Econ. 49f,w, Observation and Teaching, 8 (42, Ed. 55 or Agr. Ed. 11).

They shall add the following subjects to the Teachers' Curriculum in Home Economics:

- H. E. 25w, Experimental Cookery, 3 (H. E. 22).
 H. E. 109s, Advanced Nutrition, 5 (H. E. 108).
 H. E. Educ. 47f,w, Observation and Teaching, 8 (H. E. 34, 35, 42).

CURRICULUM IN TEXTILES AND CLOTHING

Students specializing in this curriculum may omit the following subjects from the General Teachers' Curriculum in Home Economics:

Junior Year

- H. E. 23f,w, Nutrition I, 5 (H. E. 21, Bact. 51, Agr. Biochem. 3).
 H. E. 108f,w,s, Nutrition II, 5 (H. E. 23).

Senior Year

- H. E. Ed. 49f,w,s, Observation and Teaching, 8 (H. E. Ed. 42, Ed. Psych. 55 or Agr. Ed. 11).
 H. E. 103. Dietetics, 5 (H. E. 108).

They shall add the following subjects to the Teachers' Curriculum in Home Economics:

Junior Year

H. E. 55f, Decorative Needlework and Other Crafts, 3 (H. E. 51, 53, or parallel).

Senior Year

H. E. 18w,s, Commercial Clothing Manufacture, 4 (H. E. 17).

H. E. Ed. 48f,w,s, Observation and Teaching (H. E. Ed. 42, Ed. Psych. 55 or Ag. Ed. 11).

H. E. 122w,s, Advanced Textiles, 3 (H. E. 3, Agr. Econ. 1).

CURRICULUM IN RELATED ART

Students specializing in this course may omit the following subjects from the Teachers' Curriculum in Textiles and Clothing:

Senior Year

H. E. Ed. 48f,w,s, Observation and Teaching of Textiles and Clothing.

H. E. 18w,s, Commercial Clothing Manufacture.

H. E. 122w,s, Advanced Textiles.

Econ. 126, Economics of Consumption (Econ. I).

They shall add the following courses:

Junior Year

Art Educ. 7, 8, 9; Still Life 3; 6, 7, 8, 9; Sketch 3; and 32; 4, 5, 6.

H. E. 58w, Costume Design, 3 (H. E. 13, 53, recommended 55).

Senior Year

Art Ed. 29, 30, 31; Sketch 3; 7, 8, 9.

H. E. 57s, Weaving and Other Crafts, 3 (H. E. 3, 51, 53 or 11).

H. E. 54, Interior Design, 3 (H. E. 52, 53, 131).

H. E. Ed. 49f,w,s, Observation and Teaching of Related Art, 8 (H. E. Ed. 42-53 or 11).

H. E. Ed. 43, Organization and Methods for Related Art Teaching, 3 (H. E. Ed. 42, 52, 53, 131 or 11).

CURRICULUM IN HOME ECONOMICS EXTENSION

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

Junior Year

Agr. Eng. 34w, Household Mechanics, 4
(Agr. Eng. 23 or equiv.).

20w, Home Economics Entomology, 3
(An. Biol. 6 cred.).

14f,w,s, Rural Sociology, 3 (1 or sr.
class.).

Agr. Ed. 75w,s, Visual Presentation, 3
(Ag. Ed. 11).

Senior Year

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

NATURAL SCIENCE

Advisers: H. A. Erikson, I. W. Geiger, J. A. Smith

Students preparing to teach science in Minnesota high schools should qualify to give instruction in two or more sciences, since almost all positions open to graduates require teaching in at least two fields. As a matter of

fact most Minnesota schools now require instruction in general science for which the teacher should be trained in both biological and physical sciences. 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, animal biology, physics. (On account of the mathematics requirements, students majoring in physics may satisfy the requirement by offering but 25 hours.) In the program above the word *major* means any one of these four subjects.
2. Completion of 15 hours, from one to five natural sciences: chemistry, physics, botany, animal biology, geology. This course is designated a *minor*.
3. Completion of introductory courses in two of three of the courses named under (2) not major or minor.
4. Completion of ten hours in chemistry.

The above curriculum should be elected at the beginning of the freshman year. In general it permits a student to meet the requirements of the Junior College of the College of Science, Literature, and the Arts except in the case of students majoring in physics. Such students should take Mathematics 1, 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 requirements of the Junior College by the end of the sophomore year. The following sample curricula are offered as showing distribution of courses:

FOR THOSE MAJORING IN NATURAL SCIENCE ASIDE FROM PHYSICS

FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
	Credits		Credits		Credits
English	5	English	5	English	5
Natural science	5	Natural science	5	Natural science	5
For. language	5	For. language	5	For. language	5
For. language	5	Social science	5	Social science	5
Major	5	Major	5	Major	5
Psychology	3	Psychology	3	Natural science	5
Electives	3	Electives	3	Major	5
Major	5	Major	5	Elective	5
Natural science	5	Elective	5	History of Ed.	5
Ed. Psychology	3	Ed. Sociology	3	Elective	5
Elective	3	Elective	3	Practical Teaching ..	3
Natural science	5	Natural science	5	Electives	8
Technique	3	High Sch. Sci. (Ed. 48)	3		
High School (Ed. 65) ..	3	Special method	3		
Electives	5	Elective	5		

COLLEGE OF EDUCATION

FOR THOSE MAJORING IN PHYSICS

FALL QUARTER	Credits	WINTER QUARTER	Credits	SPRING QUARTER	Credits
English	5	English	5	English	5
Natural science	5	Natural science	5	Foreign language	5
Mathematics 1	5	Mathematics 7	5	Mathematics 30	5
Physics 1 and 2	4	Physics 21-22	4	Physics 41-42	4
Foreign language	5	Foreign language	5	Foreign language	5
Mathematics 50	5	Mathematics 50	5	Mathematics 51	5
Psychology	3	Psychology	3	Electives	3
Physics 31-32	4	Physics 102	3	Physics 104	3
Natural science	5	Natural science	5	Natural science	5
Educational psychology	3	Educational sociology	3	History of Education	5
Electives	5	Electives	5	Electives	3
Physics 106	3	Natural science	5	Natural science	3
H. S. (Ed. 65)	3	H. S. Sci. (Ed. 38)	3	Practice Teaching	5
Technique	3	Special method	3	Electives	5
Elective	5	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

Major:	No.	Title	Credits
	106f-107w-108s	Advanced Educational Psychology	9
	111f-112w	Educational Diagnosis	4
	102w	History of Modern Secondary Education	3
	208f	Methods of Educational Research	2
			<hr/>
			18

Thesis

Minor:
106f-107w-108s

Botany

Major:	No.	Title	Credits
	113-114	Advanced Taxonomy	6
	118	Cytology	3
	131	Field Ecology	5
	141	Physical Phases of Plant Physiology	5
			<hr/>
			19

Thesis

Minor:
131 and 141

Chemistry

Prerequisite requirements for graduate work:

Courses 35, 36, 37, Organic (15 credits), in addition to introductory courses in General, Qualitative, and Quantitative Chemistry.

Major:	
140-141-142	Physical Chemistry 9 to 15
103-104-105	Advanced Inorganic 9
	<hr/> 18
Minor:	
103-104-105	

Physics

Major:	
101-103-105	Theoretical Physics 12
142f	Electrical Measurements 3
132w	Applied Optics 3
122	Pyrometry 3
	<hr/> 21
Minor:	
142-132-122	

Animal Biology

Major:	
109-110	General Physiology 10
181-182	Embryology 6
183	Genetics and Eugenics 3
	<hr/> 19
Thesis	
Minor:	
181-182 or 181-182-183	

OCCUPATIONAL THERAPY

Major Adviser: R. O. Beard

Freshman Year

FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
Course	No. Credits	Course	No. Credits	Course	No. Credits
Rhetoric English.. A	5	Rhetoric Eng. ... B	5	Rhetoric Eng. C	5
Animal Biology .. I	5	Animal Biology .. 2	5	Relationship of Hospital to Social Worker 157	1
French 1 or 3	5	French 2 or 9	5 to 3	French 3 or 10	5 to 3
or		or		or	
German 1 or 15	5 to 4	German 2 or 31	5 to 3	German 3 or 32	5 to 3
Preliminary		Ethics of Nursing 11	1	Hosp. and Hosp. Eco- nomics 159	1
Hygiene 4	0			History and De- velopment of Arts and Crafts 72	2
	<hr/> 15-14		<hr/> 16-14		<hr/> 14-12

COLLEGE OF EDUCATION

Sophomore Year

FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
Course	No. Credits	Course	No. Credits	Course	No. Credits
Sociology	1 5	Prin. and Pract. of Social Service	151 3	Psychology	3 3
Psychology	1 3	Psychology	2 3	Fundamental	
Fundamental Principles		Fundamental Principles		Principles	
of Design	1 3	of Design	2 3	of Design	3 3
Sketch Drawing, etc.	7 1	Sketch Drawing, etc.	8 1	Sketch Drawing, etc.	9 1
Clay-Modeling	35 1	Cardboard and Paper Construction	32 1	Occupational Therapy	158 3
Elements Prev. Med.	53 3	Occupational Hygiene and Disease	73 2	Electives	4 to 5
	16		13		14 to 15

Junior Year

FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
Course	No. Credits	Course	No. Credits	Course	No. Credits
Sociology	51 3	Sociology	52 3	Educational Sociology	3 3
History	21 5	Educational Psychology	55 3	Technique of Teaching	15 3
Prin. of Harmony in Form and Color	20 3	History	22 5	The High School	65 3
Still Life	4 1	Prin. of Harmony in Form and Color	21 3	Prin. of Harmony in Form and Color	22 3
Composition	10 1	Still Life	5 1	Still Life	6 1
Elem. Weaving, Basketry, etc.	37 2	Composition	11 1	Composition	12 1
	15		16		14

SUMMER QUARTER

Advanced Basketry	39 3
Advanced Weaving	40 3
Field Work	3 to 6*

Senior Year

FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
Course	No. Credits	Course	No. Credits	Course	No. Credits
Sociology	60 3	Educational Diagnosis	111 4	Technique of Teaching Adults	128 3
Practice Teaching	16 5	Physiology	4 5	Application of Design to Fabrics	44 2
Art History and Appreciation	70 2	Mental Hygiene	61 1	Metal Work	46 2
Allied Crafts	38 1	Bookbinding	33 2	Types of Art Instruction	84 1
Elementary Pottery	41 2	Application of Design in Needle Work	45 2	Field Work	6 to 8
Methods of Elem. Woodwork Ind.	10 2				
	15		14		14-16

* During the third year (summer quarter) and in the fourth year opportunities will be given for practice work in the hospitals of the Twin Cities. This work will receive from 3 to 6 credits according to the hours a week devoted to it.

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. 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 STUDENTS MAJORING IN
PHYSICAL EDUCATION

Major Adviser: L. T. Keller

Freshman Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Eng. A-B-C	Freshman English	5	5	5	None
An. Biol. 1-2	General Zoology	5	5	..	None
	Foreign Language	5	5	5	None
Sociol. 1	Introd. to Sociology .....	..	..	5	None
Mil. Sci. 1-2-3	First Year Basic Course...	..	..	..	None
Phys. Ed. 1-2-3	Freshman Physical Educ. ...	..	..	..	None
Phys. Ed. 4	Freshman Hygiene .....	..	..	..	None
		—	—	—	
		15	15	15	

NOTE.—If four years of one language are presented at entrance, none will be required. If three years of one language presented, 5 credits required if in same language. If two years of one language presented, 10 credits required if in same language. If less than two years of one language presented, 15 credits required. If a student registers for less than 15 credits of language, he may begin one of the subjects which would otherwise start in the sophomore year.

Sophomore Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Chem. 1-2-3	General Inorg. Chem.	4	4	4	None
Psych. 1-2	General Psychology	3	3	..	None
Anat. 3	Human Anatomy .....	..	..	4	An. Biol. 1-2
Phys. Ed. 10-11-12	Minor Sports	2	2	2	Phys. Ed. 1-2-3
Phys. Ed. 7-8-9	Advanced Leaders	1	1	1	Phys. Ed. 1-2-3
	Social Science Elective....	5	5	..	
Mil. Sci. 4-5-6	Second Yr. Basic Course...	..	..	..	Mil. Sci. 1-2-3
	General electives .....	..	..	4	
		—	—	—	
		15	15	15	

NOTE.—If one unit of chemistry is presented at entrance, Chem. 4-5 should be substituted for Chem. 1-2-3.

Suggested electives: Economics 1-2 or 3-4, Public Speaking 41-42 or 45, History 1-2, Political Science 1, Physiology 59, English, Sociology.

COLLEGE OF EDUCATION

Junior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Bact. 1	General Bacteriology	5	..	..	Biol. 1-2, Chem. 1-2-3 or 4-5
Physiol. 57-58	Human Physiology .....	..	4	4	Biol. 1-2, Chem. 1-2-3 or 4-5
Anat. 160	Physical Development of Childhood	2	..	..	None
Phys. Ed. 19-20-21	Gymnastics	1	1	1	Phys. Ed. 1-2-3
Phys. Ed. 22-23	Kinesiology	2	2	..	Anat. 4
Phys. Ed. 24	Technique of Gymnastic Teaching .....	..	..	2	Phys. Ed. 22-23
Phys. Ed. 30	Athletic Training and First Aid .....	..	..	2	None
Prev. Med. 80	Educational Hygiene .....	..	2	..	An. Biol. 1-2, Psych. 1-2
Ed. 1	History of Education	5	..	..	Psych. 1-2
Ed. 55	Educational Psychology .....	..	3	..	Psych. 1-2
	Elective .....	..	3	6	
		15	15	15	

Senior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Prev. Med. 53	Elements of Preventive Medicine	3	..	..	Psych. 1-2, Bact. 1
Phys. Ed. 28	Physical Examination and Normal Diagnosis	2	..	..	Physiol. 57-58
Phys. Ed. 29	Orthopedic and Remedial Gymnastics .....	..	2	..	Phys. Ed. 22-23, 28
Phys. Ed. 30	History of Physical Education	2	..	..	Ed. 1
Phys. Ed. 31	Principles of Physical Education .....	..	3	..	Phys. Ed. 10-11-12; 24; 31
Phys. Ed. 32	Organization and Administration of Physical Education .....	..	..	3	Phys. Ed. 32
Phys. Ed. 37	Football	3	..	..	None
Phys. Ed. 38	Basket-Ball .....	..	2	..	None
Phys. Ed. 39	Track .....	..	..	2	None
Phys. Ed. 42	Baseball .....	..	..	2	None
Phys. Ed. 43-44-45	Practice Teaching	2	2	2	Phys. Ed. 10-11-12, 24, Ed. 55
Ed. 3	Educational Sociology .....	..	3	..	Psych. 1-2
Ed. 65	The High School .....	..	..	3	Psych. 1-2
	Elective	3	3	3	
		15	15	15	

Suggested electives: Elementary Pathology, Elementary Symptomatology, Preventive Medicine 50, 54, 59, 60, 61, courses in education and in the social sciences.

COURSES FOR MEN STUDENTS MINORING IN ATHLETIC COACHING

No.	Title	Credits			Prerequisite courses
		F	W	S	
Phys. Ed. 1-2-3	Freshman Phys. Ed. ....	..	..	..
Phys. Ed. 4	Freshman Hygiene ....	..	..	..
Phys. Ed. 10-11-12	Minor Sports	2	2	2	
Phys. Ed. 27	Scouting .....	..	..	2	
Phys. Ed. 30	Athletic Training .....	..	..	2	
Phys. Ed. 35	Athletic Organization and Administration .....	..	2	..	
Phys. Ed. 37	Football	3	..	..
Phys. Ed. 38	Basket-Ball .....	..	2	..	
Phys. Ed. 39	Track Athletics .....	..	..	2	
Phys. Ed. 42	Baseball .....	..	..	2	
Anat. 3	Human Anatomy .....	..	..	4	

NOTE.—All candidates for the teacher's certificate with minor recommendation in athletic coaching, must take Physical Education 30 and 35 and Anatomy 3. The balance of nineteen credit hours may be secured from any of the courses listed above.

PHYSICAL EDUCATION FOR WOMEN

This department aims to promote the physical efficiency of the women students. It gives physical examination and advice to all on entrance; plans systematically to keep in close touch with them during their first two years of residence; conducts yearly consultations with, and examines when necessary, all upper class students; gives courses in hygiene; organizes neuromuscular activity leading toward organic strength, nervous stability, conscious motor control, correct bodily mechanics, skill in handling the body 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 Course 22-23 during sophomore year). Physical examinations or consultations are required annually of all students.

Six credits toward the degree can be gained by taking courses in exercises (Courses 43-44-45, 66-67-68, 69-70-71).

Statement of fees.—Elementary physical training \$2.50 a quarter. All other exercise courses, including swimming, \$2 a quarter. Maximum fee paid by a student in physical education, \$3.50 a quarter.

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.

COLLEGE OF EDUCATION

CURRICULUM FOR WOMEN STUDENTS MAJORING IN
PHYSICAL EDUCATION

Major Adviser: J. Anna Norris

Freshman Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
English A-B-C	Freshman English*	5	5	5	None
Chem. 14-15	Gen. Inorg. Chemistry‡	5	5	..	None
Farm Eng. 23	General Physics§ . . . . .	..	..	5	None
History 1-2	Modern World*	5	5	..	None
Sociology 1	Introduction to Sociology* . . . . .	..	..	5	None
Phys. Ed. 1, 3	Elem. Physical Training	0	..	0	None
Phys. Ed. 4	Preliminary Hygiene	0	..	..	None
Phys. Ed. 22s	Elem. Swimming . . . . .	..	..	0	None
Phys. Ed. 37-38-39||	Freshman Major Sports	0	0	0	None
Phys. Ed. 49f-50w	Freshman Major Gymnastics	0	0	..	None
		—	—	—	
		15	15	15	

Sophomore Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
An. Biol. 1-2‡	General Zoology*	5	5	..	None
Anat. 3s	Human Anatomy|| . . . . .	..	..	4	An. Biol. 1-2
Psych. 1-2‡	General Psychology*	3	3	..	None
Prev. Med. 2w	First Aid|| . . . . .	..	1	..	An. Biol. 9 cr.
Bact. 51f,w,s	General Bacteriology* . . . . .	..	..	5	Chem. 10 cr., Biol. 10 cr.
Pub. Sp. 41f-42w	Public Speaking*	3	3	..	Rhet. A-B-C or 4-5-6
Phys. Ed. 28f	Advanced Swimming	0	..	..	Phys. Ed. 22 or equivalent
Phys. Ed. 43-44-45	Play and the Playground	1	1	1	Phys. Ed. 3 qtrs.
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	Major Sports with Tech.	1	1	1	Phys. Ed. 37-38-39
Ed. 55	Educational Psychology . . . . .	..	..	3	Psych. 1-2
	Elective	3	..	..
		—	—	—	
		16½	15	14½	

NOTE.—It is suggested that the elective course be in Sociology 6, Modern Social Reform Movements.

* For description of course see bulletin of College of Science, Literature, and the Arts.

‡ The entire course must be completed before credit is received for any quarter.

‡ For description of course see bulletin of College of Chemistry.

§ For description of course see bulletin of College of Agriculture.

¶ For description of course see bulletin of College of Medical School.

|| The second or third quarter is open to students who have not taken the preceding quarter.

NOTE.—If one year of chemistry is presented at entrance the student may take instead of Course 14-15 the more intensive Course 4-5.

If one year of physics is presented at entrance no physics will be required.

Junior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Agr. Biochem. 3f,w,s,su	Types of Carbon Com- pounds	6	..	..	Chem. 10 cr.
Physiol. 58-59	Human Physiology .....	..	4	4	Ag. Bioch. 3, Farm Eng. 23, Anat. 3
Ed. 1	History of Education...	5	..	..	Psych. 1-2
Ed. 3	Educational Sociology ..	3	..	..	Psych. 1-2
Phys. Ed. 54-55	Gym. for Junior Majors.	$\frac{1}{2}$	$\frac{1}{2}$	..	Phys. Ed. 51-52
Phys. Ed. 58-59	Adv. Folk Dancing with Technique .....	..	1	1	Phys. Ed. 6 qtrs.
Phys. Ed. 60-61	Minor Sports with Tech.	1	..	1	Phys. Ed. 6 qtrs.
Phys. Ed. 66-67-68	Elem. Interp. Dancing..	1	1	1	Phys. Ed. 6 qtrs.
Phys. Ed. 75	History of Phys. Ed. ..	..	1	..	
Phys. Ed. 80-81	Kinesiology	4	4	..	Anat. 3, Farm Eng. 23
Phys. Ed. 82	Physical Examination ..	..	..	2	Phys. Ed. 80-81
Phys. Ed. 83	Tech. of Gym. Teach. ..	..	..	3	Phys. Ed. 54-55, 80-81
	Elective .....	..	..	3	
		<hr/>	<hr/>	<hr/>	
		15 $\frac{1}{2}$	16 $\frac{1}{2}$	15	

Senior Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Ed. 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. 84	Principles of Gym.	3	..	..	Phys. Ed. 55, 82
Phys. Ed. 85-86	Principles of Phys. Ed.	..	2	1	Phys. Ed. 45, 59, 61, 65, 69, 84
Phys. Ed. 87	Personal and School Hygiene .....	..	..	3	Physiol. 57-58
Phys. Ed. 88-89-90	Orthopedic and Remedial Gymnastics	1	1	1	Phys. Ed. 83
Phys. Ed. 91f	Principles of Dancing...	2	..	..	Phys. Ed. 59, 68
Phys. Ed. 92f-93w- 94s	Practice Teaching in Playground, Gymnas- tics, Major Sports	1	2	1	Phys. Ed. 45, 61, 65, 84
Phys. Ed. 95s	Prac. Teaching in Danc- ing and Swimming ...	..	..	1	Phys. Ed. 57, 70, 91
Phys. Ed. 97w	Organization and Ad- ministration .....	..	3	..	Phys. Ed. 75
	Electives	4	5	6	
		<hr/>	<hr/>	<hr/>	
		15	14	13	

COURSE FOR WOMEN STUDENTS MINORING IN PHYSICAL EDUCATION

No.	Cr.	Title	Offered to	Prerequisite courses
Phys. Ed. 1-2-3	0	Elem. Phys. Training	Required of all new students	None
Phys. Ed. 4	0	Prelim. Hygiene	Required of all new students	None
Phys. Ed. 22-23	0	Elem. Swimming . . .	Soph.	None
Phys. Ed. 33-34	0	Basket-Ball and Base- ball	Fr., jr., sr.	Permission of director
Phys. Ed. 43-44-45	3	Play and Playground.	Jr., sr.	Phys. Ed. 6 qtrs.
Phys. Ed. 51-52	1	Gym. for Sophomore Majors	Jr. minors	Phys. Ed. 1-2-3
Phys. Ed. 54-55	1	Gym. for Junior Majors	Sr. minors	Phys. Ed. 51-52
Phys. Ed. 64-65	2	Major Sports with Technique	Jr., sr.	Phys. Ed. 33-34
Phys. Ed. 80	4	Kinesiology	Jr., sr.	An. Biol. 1-2, Anat. 3
Phys. Ed. 83	3	Technique of Gym- nastic Teaching . . .	Sr.	Phys. Ed. 80, 54-55
Anatomy 3	4	Human Anatomy . . .	Soph., jr.	An. Biol. 1-2
Prev. Med. 50	3	Public and Personal Health	Jr., sr.	An. Biol. 1-2; Psych. 1-2
Education 1	5	History of Education	Jr., sr.	6 cred. in psych.
Education 3	3	Educational Sociology	Jr., sr.	6 cred. in psych.
Education 11	3	Technique of Teach- ing	Jr., sr.	Ed. 45
Education 55	3	Educational Psych...	Jr., sr.	6 cred. in ed.
Education 65	3	The High School....	Jr., sr.	6 cred. in psych.

SCHOOL PSYCHOLOGIST

Major Adviser: M. E. Haggerty

Students who wish to qualify for a certificate for school psychologist will be required to complete the work for a Master's degree with educational psychology as a major.

The regular Junior College requirements must be fulfilled.

The following courses are recommended since some of them are pre-requisites to required courses in the Senior College:

	Credits
Animal Biology 1 and 2	10
Mathematics 65	5
Chemistry	10
Sociology 1	5
Psychology 1 and 2	6
Psychology 4 and 5 (Laboratory)	4
Human Physiology 4	5

SENIOR COLLEGE

In addition to the required courses for the juniors and seniors listed below the candidate must earn a total of 24 credits selected from the following electives:

Psychology 124f (Psychology of Learning) 3 credits; Psychology 121f-122w (Neuro-Psychology) 6 credits; Psychology 114w-115s (Human Behavior) 6 credits; Psychology 125f-126w (Psychology of Individual Differences) 6 credits; Sociology 55 (The Occurrence of the Socially Inadequate) 3 credits; Sociology 52 (Elementary Case Work) 3 credits; Anatomy 134 (Physical Development of Childhood) 2 credits; Education 167f (Junior High School) 3 credits; Education 3 (Educational Sociology) 3 credits.

Junior Year

FALL QUARTER			WINTER QUARTER			SPRING QUARTER		
No.	Title	Credits	No.	Title	Credits	No.	Title	Credits
55f	Ed. Psych.	3	144w	Psychology,		145s	Psychology	3
	Electives	12		Abnormal	3	111	Ed. Diagnosis....	3
			50w	Prev. Medicine...	3	113s	H. S. Curriculum 3	
				Electives	9	119f	Elementary School	
							Curriculum ...	3
							Electives	3

Senior Year

134f	Mental Tests and		135w	Mental Tests and		136s	Mental Tests and	
	Diagnosis	2		Diagnosis	2		Diagnosis	2
116f	Statistical Methods 2		117w	Statistical Methods 2		118s	Statistical Methods 2	
106f	Adv. Ed. Psych... 3		107w	Adv. Ed. Psych... 3		108s	Adv. Ed. Psych... 3	
124f	Ed. Admin. 3			Electives	8	64s	Vocational Psych.. 2	
	Electives	5				183s	An. Biology 3	
							Electives	3

Graduate Year

149f	Psycho-Educational		150w	Psycho-Educational		151s	Psycho-Educational	
	Clinic	2		Clinic	2		Clinic	2
184f	Mental Deficiency 2		185w	Mental Deficiency 2		186s	Mental Deficiency 2	
201f	Ed. (Seminar)... 2		202w	Ed. (Seminar)... 2		203s	Ed. (Seminar)... 2	
	Electives	3		Electives	3		Electives	3
	Thesis	0		Thesis	0		Thesis	0

PUBLIC SCHOOL MUSIC

Major Adviser: T. P. Giddings

First Year

No.	Title	Credits			Prerequisite courses
		F	W	S	
Eng. A-B-C	Rhetoric	5	5	5	None
Hist. 11-12-13	Med. Hist.	3	3	4	None
Mu. 1-2-3	Harmony	3	3	3	None
Mu. 7-8-9	Ear-Training	1	1	1	None
Mu. 16-17-18	Piano	2	2	2	None
*Mu. Mu.Elec.	Voice or other instrument	2	2	2	None

Second Year

Psych. 1-2	Gen. Psych.	3	3	..	None
Physics 9	Acoustics .....	..	..	3	None
Ed. 29-30-31	Grade School Methods...	3	3	3	None
Ed.(Mu) 71-72-73	Class Instr. Teaching...	1	1	1	None
Mu. 103-104-105	Analysis	1	1	1	Mu. 1-2-3
Mu. 112-113-114	Ensemble	2	2	2	None
Mu. 19-20-21 or	Piano (6 credits) or				
Mu. 50-51-52	Organ (6 credits).....	2	2	2	Fr. Prac. Music
‡Mu. Mu.Elec.	Voice or other instrument	2	2	2	Fr. Prac. Music

* Must elect 6 credits in some one of the following: (a) Voice 28-29-30; (b) Violin 22-23-24; (c) Other Orchestral Instrument 34-35-36.

‡ Must elect 6 credits in some one of the following: (a) Voice 31-32-33; (b) Violin 25-26-27; (c) Other Orchestral Instrument 37-38-39.

Third Year

Ed.(Mu)74-75-76	Advanced Class Instru- ment Teaching	1	1	1	71-72-73
Ed. 32-33-34	High School Methods.....	3	3	3	75-76-77
Mu. 106-107-108	Hist. of Music	3	3	3	1-2-3, 4-5-6
Mu. 115-116-117	Adv. Ensemble	2	2	2	112-113-114
Ed. 3,55, 1	Ed. Soc., Ed. Psych., Hist. of Ed.	3	3	3	
Ed. 51-52-53	Instrumentation	1	1	1	None
Mu. 40-41-42 or 43-44-45	Orchestra or Chorus.....	1	1	1	
§Mu. Mu.Elec.	Piano, voice or other instrument	2	2	2	Soph. Prac. Music

Fourth Year

Ed. 64-65-66	Orchestra-Conducting	2	2	2	
Ed. 81-82-83	Observing and Teaching..	2	2	2	78-79-80
Ed. 54-55-56	Adv. Instrumentation.....	1	1	1	51-52-53
Mu. 40-41-42, 43-44-45	Orchestra or Chorus.....	1	1	1	
¶Mu. Mu.Elec.	Piano, voice or other instrument	2	2	2	Jr. Prac. Music

MINOR IN PUBLIC SCHOOL MUSIC

Mu. 1-2-3	Harmony	3	3	3	None
Mu. 7-8-9	Ear-Training	1	1	1	None
Ed. 29-30-31	Grade School Methods ...	3	3	3	None
Ed. 51-52-53	Instrumentation	1	1	1	None
Ed. 64-65-66	Orchestra-Conducting	2	2	2	None

Thirty-six credits in Practical Music are required for graduation.

SOCIAL STUDIES

Major Adviser: A. C. Krey

Two facts make it desirable for students to secure training in more than one of the social sciences including history. The first of these facts is the divided program which teachers in Minnesota high schools are required to follow. Relatively few beginning teachers find it possible to devote themselves wholly to the teaching of one high school subject. The second fact is the increasing demand in high school for courses in "social science" which is a composite course involving the elements of political science, economics, and history. A more elementary course of similar nature is being offered in junior high schools. Two possible ways of preparing to meet the situation are recommended:

- § Must elect 3 credits in some one of the following: (a) Voice 68-69-70;
 (b) Violin 62-63-64; (c) Other Orchestral Instrument 74-75-76.
 ¶ Must elect 3 credits in some one of the following: (a) Voice 71-72-73;
 (b) Violin 65-66-67; (c) Other Orchestral Instrument 77-78-79.

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 36 credit hours (see statement under History). Political Science, 1, 7 and 11 or 15. Economics 3-4. Sociology 1, 6, and 14.
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 3-4, 143-144 and if possible 161 and 191-192. Political Science 1, 7, 11 or 15 and one course on foreign governments or relations. Sociology 1, 6, 14, and either 51, 52 or 53, 60 and either 100, 120, or 122. History 5-6 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.

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 degrees of bachelor of arts and master of arts is recommended.

Freshman Year

Rhetoric-English	15
Language	10(norm.)
Science	10
History 1-2	10
	—
	45

Sophomore Year

History 5-6	10
Psychology	6
Group	15
Political Science 1 and 7.....	10
	—
	41

Junior Year

Economics 3-4	10
History 105 or 133 and 119 or 120.....	10
Sociology 1, 6 and 14	11
Education 1, 3 and 55	11
	—
	42

Senior Year

Economics 143-144	8
Political Science 11 and 15	10
Sociology 51, 52 or 53, 60, 100	9
History, intensive course	5
Education 15, 25 and 113	9
	—
	41

Graduate Year

Economics 161 and 191-192	9
Political Science course numbered over 100	5
Sociology 110 and 120 or 122	6
Education 16 and 5 credits to be chosen from Courses 101, 102, 124, 116-117, 134-135-136 and 167	10
	<hr/>
	30

Thesis in one of the departments with such additional work as may be necessary for the satisfactory preparation of the thesis.

SOCIOLOGY

Major Adviser: R. L. Finney

MAJOR IN SOCIAL THEORY (36-37 hrs.)

Course No.	Name of Course
Major Sequences 1	Introduction to Sociology
14	Rural Sociology
6	Modern Social Reform Movements
and 53	Elements of Criminology
or 45	Social Statistics
51	Occurrence of the Socially Inadequate
119	The Family
or 120	Social Progress
100	Social Psychology
101	Social Organization
102	Social Control
110	Community Organization and Social Work in Small Towns and Country
114	Rural Social Institutions
or 140	History of Social Theory
121	Advanced Statistical Methods
or 141	Contemporary Social Theory

MAJOR IN APPLIED SOCIOLOGY (36-37 hrs.)

1	
14	
45	
51	
52	Elementary Case Work
60	Child Welfare
90	Elementary Field Work
91	Elementary Field Work
100	
112	The Rural Social Survey
or 122	Methods of Social Investigation
119	
or 134	Legal Protection of the Child
110	
or 114	
or 128	Principles of Administration Applied to Social Work
or 130	Advanced Case Work

MINOR SOCIOLOGY

1	
6	
or 14, and 4 other courses (19-20 hrs.)	

TEACHERS OF SUBNORMAL CHILDREN

Major Adviser: J. G. Rockwell

The arrangement with the city schools of Minneapolis and St. Paul provides for a limited number of cadetships open to students only during the regular college year. Each cadetship will require that the student devote part of his time to study at the University and part to field service in the subnormal classes of the Minneapolis and St. Paul schools. Each cadetship will pay a stipend of \$60 a month. Students desiring to apply for a cadetship are required to file their applications with Mr. W. F. Webster, superintendent of schools, Minneapolis, or Mr. E. C. Hartwell, superintendent of schools, St. Paul, and with Mr. M. E. Haggerty, dean of the College of Education, University of Minnesota.

Students who complete the freshman and sophomore years of this course, and 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 such courses as they are qualified, on the basis of previous training and experience, to carry in the junior and senior years.

Freshman Year

FALL QUARTER			WINTER QUARTER			SPRING QUARTER		
No.	Title	Credits	No.	Title	Credits	No.	Title	Credits
A	Fresh. English....	5	B	Fresh. English...	5	C	Fresh. English...	5
I	An. Biol.	5	2	An. Biol.	5	1	Introduction to	
1f	Art Education....	3	2w	Art Education ...	3		Sociology	5
	Elective	2		Elective	2	3s	Art Education ...	3
							Elective	2

Sophomore Year

1	Psychology	3	2	Psychology	3	3	Ed. Sociology....	3
4	Psychology Lab...	2	5	Psychology Lab...	2	H.E.57	Weaving on Table	
1	History	5	2	History	5		Looms	3
37	Art Education ...	2	32	Art Education ...	1	10	Meth. Elem. Grade	
	Elective	3	11	Meth. Prim. Grade			Woodwork	3
				Woodwork	2		Elective	6
				Elective	3			

Junior Year

184	Mental Deficiency.	2	185	Mental Deficiency.	2	186	Mental Deficiency	2
134	Mental Tests	2	135	Mental Tests....	2	136	Mental Tests	2
31	Phys. Ed.	0	32	Phys. Ed.	0	33	Phys. Ed.	0
151	Elem. Methods... 2	152	Elem. Methods .. 2	153	Elem. Methods ... 2	153	Elem. Methods... 2	
	Elective	8		Elective	8		Elective	8

Senior Year

149	Psycho-Ed. Clinic	3	150	Psycho-Educational Clinic	3	151	Psycho-Educational Clinic	3
51	Sociology	3		Elem. Case Work	3	60	Child Welfare	3
17	Practice Teaching	2	52	Practice Teaching	2	17	Practice Teaching	2
	Elective	7	17	Elective	7		Elective	7

FOUR-YEAR CURRICULUM TRADE AND INDUSTRIAL EDUCATION

Major Adviser: H. J. Smith

(Required of all, 115 credits. Additional specified groups, each 18 credits. Elective with limits on shopwork, 47 credits. Total 180.)

FALL QUARTER		WINTER QUARTER		SPRING QUARTER	
	Credits		Credits		Credits
Eng.Af, Rhet. (no pre-req.)	5	Eng.Bw, Rhet. (prereq., Af)	5	Eng.Cs, Rhet. (prereq., Bw)	5
Ind.4of, Occup. Analy. (no prereq.)	2	Ind.41w, Job Analy. (no prereq.)	2	Ind.42s, Select. of Rel. Material (prereq., 4of)	2
Ind.2of, Ind. History (no prereq.)	2	Ind.3ow, Graphic Presentation	2	Soc.1s, Intro. to Soc. (no prereq.)	5
Shopwork	6	Drawing	3	Drawing	3
		Shopwork	3		
Econ.3f, Prin. of Econ. (no prereq.)	5	Econ. 4w, Prin. of Econ. (no prereq.)	5	Ind.25s, Lit. of Voc. Ed. (no prereq.)	2
Psych.1f, Gen. Psych. (no prereq.)	3	Psych.2w, Gen. Psych. (no prereq.)	3	Ed.Psych.55s, Ed. Psych. (prereq., Psych. 12)	3
Ind.6of, Soc. Agencies in Ind. Ed. (no prereq.)	2	Shopwork	4	Ind.61w, Soc. Sig. of Ind. Ed. (prereq., Ind. 6o)	2
Shopwork	2	Electives	3	Electives	8
Electives	3				
Econ.161f, Labor Problems and Trade Unionism (prereq., Econ.3-4)	3	Ind.7o, Meth.—Shop Subjects (prereq., Ind. 41)	2	158. Tech. of Teach. (prereq., Ed. 55)	3
Ed.Psych.111f, Ed. Diag. (prereq., Ed. 55)	2	Ed.3w, Ed. Soc. (prereq., Soc. 1)	3	Ind.66, Meth., Related Subjects (prereq., Ind. 42)	2
Drawing	2	Ed.Psych.112w, Ed. Diag. (prereq., 111f)	2	Ed.103s, Hist. of Mod. Elem. Ed. (prereq., 6 cr. in Psych. and 6 cr. in Hist.)	3
Ed.124f, Ed. Adm. (prereq., 10 or in Ed.)	3	Drawing	2	Electives	7
Electives	5	Electives	6		
Ind.5of, Prac. Teaching (prereq., 11 and Ind. 65, 66, or 67)	2	Ind.51w, Prac. Teach. (prereq., 5of)	2	Ind.52s, Prac. Teach. (prereq., 5ow)	2
Ind.171f, Admin. of All-Day Schools	2	Ind.172w, Admin. of Evening Schools (prereq., 171)	2	Ind.173s, Adm. of Part-Time Schools (prereq., 172)	2
Electives	11	Electives	11	Electives	11

ELECTIVE GROUPS

Each student will be required to elect one of the eight groups designated below.

1. *Manual Training or General Industrial Training Teachers for Towns of All Sizes*

	Credits
Shop courses, varied (woodwork, printing, electricity, sheet metal, machine shop practice, etc.).....	8
Drawing courses (mechanical or architectural)	2
Ind. 80, General Industrial Training	2
Ind. 13, Organ. and Super. of Manual Training.....	3
Ed. 65, The High School (Cr. 167 Jr. H. S.)	3
	—
	18

2. *Teachers of Special Shop Subjects for Boys or Girls*

	Credits
Shop courses, <i>intensive</i> (any trade, men or women).....	8
Related Drawing	2
Related Science	2
Related Mathematics	2
Related Hygiene and Safety	2
Ed. Psy. 64, Voc. Psychology	2
	—
	18

3. *Teachers of Related Subjects*

	Credits
Physics 21, Heat	3
Physics 41, Magnetism and Electricity.....	3
Chem. 1, General Inorganic Chemistry	4
Special Methods, (math., drawing, physics, chem., hygiene and safety, art)	3
	—
	18

4. *Teachers of Non-Vocational Subjects*

	Credits
Ind. 65, Methods, Non-Vocational Subjects	2
Special Methods (Eng., social science, geography, etc.).....	4
Ed. 134-135-136, Mental Tests	6
Amer. 128, Teaching Adults	3
Soc. 100, Social Psychology	3
	—
	18

5. *Cò-ordinators and Directors of Part Time Schools and Classes*

	Credits
Ed. Psych. 116, Statistical Method in Ed.	2
Econ. 167, Industrial Relations	3
Econ. 168, Personal Management	3
Soc. 100, Social Psychology	3
Soc. 102, Social Control	3
Ind. 65, Methods, Non-Vocational Subjects	2
	—
	18

6. *Directors of Day and Evening Industrial Schools*

	Credits
Ed. 164, High School Administration	3
Ed. Psych. 116, Statistical Method in Ed.	2
Ed. 160f, Supervision of Elementary School Instruction....	2
Ed. Psych. 64, Vocational Psychology	3
Econ. 167, Industrial Relations	3
Soc. 100, Social Psychology	3
Soc. 102, Social Control	3
	—
	18

7. *Supervisors of Industrial Education for Cities and States*

	Credits
Ind. 80, General Industrial Training	3
Ed. Psych. 116, Statistical Method in Ed.	2
Ed. Psych. 64, Vocational Psychology	2
Ed. 125-126, City School Administration	6
Ed. 160, Supervision of Elementary School Instruction.....	2
Ed 65, The High School	3
	—
	18

8. *Directors, Assistants, and Field Workers in Vocational Advisement and Placement*

	Credits
Ed. Psych. 64, Vocational Psychology	2
Ed. Psych. 134, 5-6, Mental Tests	6
Ed. Psych. 116, Statistical Method in Ed.	2
Ed. 160f, Superv. of Elementary School Instruction.....	2
Econ. 167, Industrial Relations	3
Soc. 100, Social Psychology	3
	—
	18

SHOP WORK AND DRAWING CREDITS ALLOWED

Shop work and drawing credits of collegiate grade, earned in the University of Minnesota or accepted in transfer from approved schools and colleges may be allowed to the extent of not more than 20 credits in addition to the 15 credits in shop work and 10 credits in drawing specified in the curriculum.

UNDERGRADUATE CURRICULUM FOR VISITING TEACHERS

Major Adviser: L. J. Brueckner

Freshman Year

	Credits
English A-B-C	15
History 5-6 or Language	10
An. Biology	10
Sociology 1	5
Pol. Science 1	5
	—
	45

COURSES OF STUDY

Sophomore Year

	Credits
History 21-22	10
Economics 3-4	10
Psychology 1-2	6
Pol. Science 7	5
Sociology 6, 45	8
	—
	39

Junior Year

	Credits
Education 15	3
Education 1, 3, and 55	11
Sociology 51, 52, 53, 70, 90, 91	16
Home Economics 70-71-72	9
	—
	39

Senior Year

	Credits
Educational Psychology 184-185-186	6
Five credits from 101, 102, 124, 116-117, 134-135-136, 167... ..	5
Economics 161-162 or Psychol. 144-145	6
Sociology 60, 92, 128, 130, 134, 138-139	18
Sociology 153-154-155	9
	—
	44

DESCRIPTION OF COURSES

EDUCATION—GENERAL COURSES

Graduate conference.—All graduate students majoring in education are required to meet with the department staff every alternate Monday evening from 7:15 to 9:00 for conference regarding subjects of original investigations. This work carries no credit.

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*.

208. Methods in Educational Research. A study of the methods employed in treatment and presentation of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for degrees.

ADMINISTRATION AND SUPERVISION

65. The High School. For high school teachers in training. Recent growth in secondary education; types of reorganization; types of programs of study; types of high schools; plant; costs; standardization.
- 113-114. High School Curriculum. A study of types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units.
115. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul.
119. Elementary School Curriculum. A study of the principles underlying the organization of subject-matter for courses in the elementary school, including an examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum.
- 119T-120T. Elementary School Curriculum. (Same as above for teachers.)
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.
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.
124. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations.

- 125-126. City School Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration.
127. The City School Superintendent. A practical consideration of the duties of the superintendent: history; qualifications; present status; relations to the board of education, the staff, the pupils, and the public; types of administrative procedures; records; reports; professional ethics.
160. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete applications to present day problems; case studies.
- 161a. Supervision: Uses of Educational Tests in Improving Instruction. Objective evaluation of the results of teaching; diagnosis of pupil difficulty; remedial work; tests as aids to teaching; following up a testing program.
- 161b. Elementary School Supervision. The adjustment of the curriculum to the abilities of pupils in the elementary school; methods of classifying pupils according to achievement and intelligence.
- 162a. Supervision of English in the Elementary Schools. Improvement of instruction in oral and silent reading; the results of scientific investigation in reading; use of standardized and informal tests; remedial work; some consideration of spelling and writing.
- 162b. Supervision of Social Sciences in the Elementary Schools. The scientific work being done on the course of study; in geography, history, science, and related fields; improvement of instruction in social sciences in the elementary schools.
- 162c. Supervision of Arithmetic in the Elementary Schools. The improvement of instruction in arithmetic; the evaluation of the course of study; standardized drill exercises; diagnosis of specific pupil difficulty and remedial work; tests as aids of teaching.
164. High School Administration. A study of elimination from school, secondary vocational education, the marking system, classification of students, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building, costs.
- 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.
174. Public School Finance. A critical study of problems of federal and state aid to public schools: sources, methods, principles, needed reforms. Students are strongly advised to take as preparatory or in conjunction with this course Economics 191f-192w, Public Finance, and Education 126f-127w, Methods of Educational Research. (Not offered 1924-25.)
175. City School Finance. Study of the problems of school support peculiarly related to the city district; municipal school funds, sources and expenditures; analysis of unit costs, comparative cost accounting systems, budgets, financial records and reports.

- 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.
- 205-206-207. Seminar in Educational Administration.
- 215-216-217. Seminar in Public Education in the United States. Research course devoted to intensive study of certain factors determining the problem of public education in the United States. The following may be considered typical problems: school support, school supervision, administrative units.
- 218-219-220. Seminar in Secondary School Problems.

AGRICULTURAL EDUCATION

COLLEGE OF EDUCATION

11. Principles of Vocational Education. The fundamental principles upon which education is based. Emphasis is placed on those phases which are most closely related to vocational education.
21. Vocational Education. A short history of vocational education; present status in Europe and the United States; manual training and home arts in an educational system; place of agriculture in the public schools with special reference to Minnesota.
41. Apprentice Teaching. An introductory course in teaching, including observation of class work, apprentice teaching, and special conference discussions of problems relating to teaching. Intended to initiate the student into the routine of classroom procedure. Professional readings.
42. Teaching. Preparation of lesson plans and actual teaching of classes under careful supervision in recitation and laboratory; criticism and discussion of plans, methods, and results of student teaching. Review and discussion of assigned professional readings.
75. Visual Presentation. To prepare persons for presenting materials by means of slides, films, charts, etc. Students assist in assembling materials for their own use and in acquiring skill and technique in preparation and operation of various mediums.
81. Extension Work. Federal, state, and local extension aims, organization. Assembling and use of extension data and equipment. Development of extension methods especially as applied to the work of Minnesota.
82. Agricultural Extension Field Work. Actual field practice in extension work on part salary in addition to credits. Number admitted to course limited by positions available. Usually will cover summer quarter, may extend into fall quarter.
121. Teachers' Course, Home and School Gardening. A lecture and laboratory course designed to give teachers the preparation necessary for the proper planning, management, and supervision of home and school gardens. (Not offered in 1924-25.)
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.
151. Organization and Management. Organization and management of work in secondary schools, particularly in Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and co-ordination of work.
 153. Consolidated Rural Schools. To prepare principals to meet the problems of organization and management peculiar to consolidated rural schools, such as building arrangements, curriculum adjustments, transportation of pupils, and home project work.
 154. Rural Education and Community Life. The rural school as a community center, and ways and means of organizing educational and recreational activities, such as clubs, festivals, fairs, and other desirable features of rural community life. (Not offered in 1924-25.)
 155. Consolidated Rural School Problems. Opportunities for intensive study and research in special problems of administration and supervision of village and consolidated rural schools. (Not offered in 1924-25.)
 164. Fundamentals of Agriculture. Basic principles of agricultural science and elements of practical agriculture. Emphasis on concrete problems in soils, crops, and animal husbandry, as related to classroom instruction and to school and home projects. (Not offered in 1924-25.)
 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 Education. Special attention to use of visual aids in teaching agriculture. The development of proper visual methods by means of research.
 - 191-192-193. Seminar in Agricultural Education. Critical studies of important problems in agricultural education; opportunity for individual investigation and research; review and interpretation of current educational literature.

ART EDUCATION

FUNDAMENTAL PRINCIPLES OF DESIGN

- 1-2-3. Fundamental Principles of Design. Elementary problems involving space-breaking with parallel lines; emphasis on value relations; applications to problems developed in the handicrafts. The decorative use of nature material. Inspiration from nature, not imitation of nature forms.
- 20-21-22. Principles of Harmony in Form and Color. Color theories of Munsell, Wilson, and Sargent, discussed and exemplified, with analysis of color harmonies and original work therein. Application of color harmonies in original designs throughout the year, with reference to execution in handicraft and by commercial processes. Prerequisite: 90 hours credit in design, except in specially arranged cases.

- 50w-51s. Commercial and Industrial Design. 50. Advertising design and lettering; 51, design for industry. Subject-matter appropriate for high school art-teaching, with emphasis on governing principles. Prerequisite: 18 credits in design except in specially arranged cases.
- 53w-54s. Design for the Consumer. 53. Problems of house-planning, decoration, and furnishings; 54. problems of costume-selecting and designing. Subject-matter appropriate for art-teaching in high schools, emphasis on governing principles. Art history an important part of courses. Prerequisites: 18 credits in design.
- 55-56-57. Fundamental Art Principles (for public school teachers of subjects other than art). (Offered in summer 1925.)

DRAWING

- 4,5,6. Still Life. Drawings from objects in charcoal and pencil. Emphasis on value relations, form, and perspective.
- 7,8,9. Sketch-Drawing from the Posed Figure in Charcoal and Pencil. Action and memory drawings. Emphasis on action, form, and value relation.
- 10-11-12. Composition. Drawing from imagination. Stimulation by poetry and music. The medium: charcoal.
- 23,24,25. Water Color. Drawings from objects. Emphasis on form, color, and technical handling.
- 26,27,28. Charcoal, Pencil, Pen Technique. Drawings from objects in these mediums.
- 29-30-31. Sketch from Pose.
- 60f,61w,62s. Advanced Water Color.
- 63,64,65. Advanced Techniques.
- 66,67,68. Advanced Sketch.

HANDICRAFTS

32. Cardboard and Paper Construction. Subject-matter for public school work.
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.
35. Clay-Modeling. Representation of familiar objects, and illustrative modeling. (Not offered in 1924-25.)
- 37,38. Elementary Weaving, Basketry, and Allied Crafts, with reference to use in the grades and in occupational therapy.
39. Advanced Basketry.
40. Advanced Weaving.
41. Elementary Pottery. Hand building.
- 42w-43s. Advanced Pottery. Work on wheels, casting, firing, and glazing.
- 44s. Application of Design to Fabrics by means of block printing, stenciling, batik, and other dyeing processes.
- 45w. Application of Design in Needlecraft. Problems appropriate for public school work. Peasant stitches.

- 46s. Metal Work. Fundamental processes of shaping, sawing, saw-piercing, riveting, and soldering.

ART HISTORY AND APPRECIATION

70. Art of the Italian Renaissance. (Not offered in 1924-25.)

TEACHER-TRAINING

- 80,81,82. Types of Art Instruction. Specific problems of art-teaching in relation to practice teaching in Minneapolis public schools. Includes attendance upon art supervisor's meetings.
83. Teacher's Course in Art. Survey of art-teaching practices. Study of governing principles. History and philosophy of art-teaching. Making of outlines for public school application.
- 86,87,88. Practice Teaching in Art.

EDUCATIONAL PSYCHOLOGY

55. Educational Psychology. A survey of fundamental facts of human behavior, involved in educational activities. Open to juniors and seniors.
57. Ontogenetic Psychology. With emphasis on the activities of the pre-school child.
- 106-107-108. Advanced Educational Psychology. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical learning experiments. Study of group and individual differences, and their relations to educational practice.
111. Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests.
- 111T-112T. Educational Diagnosis. Same as above for teachers.
- 116a. Elementary Statistical Methods. Designed to supply the immediate statistical technique necessary for the pursuit of studies in education.
116. Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course or 116a is ordinarily required of all candidates for advanced degrees.
- 117-118. Advanced Statistical Methods in Education. A survey of statistical studies in education with special reference to the methods employed and the reliability of the results obtained.
- 130s. 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.
- 134-135-136. Mental Tests and Mental Diagnosis. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of individual and group mental tests. A critical study of group tests. Technique of classification of students by means of mental tests.

- 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 191w or 106-107-108.
- 143-144-145. 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.
- 149-150-151. Psycho-Educational Clinic. Conducted in co-operation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data.
- 153-154-155. Research Problems. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology.
- 184-185-186. 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.
- 191w. Systematic Educational Psychology. Advanced course covering the field of psychology as related to education. Open to seniors and graduate students. Not open to students who receive credit for Educational Psychology 106-107-108.
192. The Psychology of Behavior Problems in Children.
193. Speech Disorders of Public School Children.
- 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. (Not offered in 1924-25.)
- 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

1. Brief Course in History of Education. Current school problems and educational theories in the light of their history. Emphasis upon secondary education, and those aspects of education of most immediate concern to high school teachers.
3. Educational Sociology. A study of education as a means of solving social problems and directing the evolution of institutions.
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.

101. Foundations of Modern Education. Historical analysis and interpretation of the more important elements in modern education derived from the Hebrews, Greeks, Romans, Middle Ages, and Renaissance.
102. History of Modern Secondary and Higher Education. A survey of existing types of American and European secondary and higher schools, followed by a historical study of their origin, aims, growth.
103. History of Modern Elementary Education. The institutions, theories, and problems of modern elementary education in the light of their history. Emphasis upon the rise of state systems and upon the history of modern educational reform.
114. Philosophy of Education. A discussion of philosophically formulated ideals of education with an attempt to reach a positive philosophy of educational values.
- 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.
- 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.
187. Seminar in Educational Sociology. The sociological foundations of educational theory will be discussed, with the investigation of specific problems.
- 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

40. Child-Training. Application of modern science in rearing, training, and educating children. Emphasis is placed on the physical care of the baby; infant-feeding; infant diseases; early training; obligation of the home; obligation of the nation.
42. Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. Required of all students preparing to teach.
43. Organization and Methods for Related Art-Teaching. Organization of a related art course and methods of teaching art principles as applied to familiar objects and processes.
46. Observation and Teaching: Related Art. A course similar to 47, but dealing with the teaching of related art.
47. Observation and Teaching: Foods and Home Management. Observation of teaching in regular classes; criticism and discussion of class practice, lesson plans, methods, results, and examinations; preparation

- of lesson plans, and directed teaching of foods and cookery, and home management.
48. Observation and Teaching: Textiles and Clothing. A course similar to 47, but dealing with the teaching of textiles and clothing.
49. Observation and Teaching: General Home Economics. A combination of 47 and 48 giving the student experience in teaching both fields of work. Required of students in the general teaching course. Those who have completed 46, 48, or 49 may register and receive 2 credits.
141. Problems in Home Economics Education. Problems of administration and supervision of home economics, study of curricula for the day, part-time and evening schools, consideration of the home project, the hot lunch, and other related work.

PHYSICAL EDUCATION FOR MEN

- 1-2-3. Freshman Physical Education. Mass activities, corrective exercise, apparatus work, swimming, athletics, games, and efficiency test.
4. Freshman Hygiene. Fall quarter A-H; Winter quarter I-R; Spring quarter S-Z.
- 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.
- 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.
- 13-14-15. Corrective Work. By petition in place of Physical Education 1-2-3.
- 16-17-18. Drill Substitution. By petition in substitution for Military Science.
- 19-20-21. Gymnastics. Gymnastic marching, calisthenics, light and heavy apparatus work, and tumbling.
- 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.
24. Technique of Gymnastic Teaching. Lectures and quizzes on terminology, and technique of teaching.
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.
29. Orthopedic and Remedial Gymnastics.
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.
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.

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.
33. Organization and Administration of Physical Education. Problems of organization, administration, and supervision. Correlation of various phases of work; health supervision, health instruction, required and elective courses, intramural and interinstitutional athletics. Construction, equipment, and care of gymnasias and fields. Athletic management.
35. Athletic Organization and Administration. Discussion of place of athletics in physical education program; organization for athletic control; schedule-making; construction and maintenance of athletic fields; purchase and care of equipment; eligibility problems; management of contests; financial accounting; insignias and awards.
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.
38. Basket-Ball. Lecture 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.
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.
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.
- 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

- 1-2-3. Elementary Physical Training. Lighter forms of gymnastics, apparatus work, orthopedic exercise, folk dancing, indoor and outdoor games. Individual health consultations. Shower bath fee, \$2.50 per quarter.
4. Preliminary Hygiene. One lecture a week. The most essential aspects of the care of personal health.
- 7-8-9. Sophomore Physical Training. Floor work, apparatus, and indoor and outdoor games.
- 10-11-12. Sophomore Orthopedic Gymnastics. For those not able to take regular class work.

- 13-14-15. Sophomore Interpretive Dancing. An art and a phase of physical education designed to develop a sense of beauty and body control through rhythmic movements prompted by the imagination.
- 16-17-18. Sophomore Games and Folk Dancing. Suitable in strength for C-D girls. Conducted outdoors when weather permits.
- 19-20-21. Sophomore Major Sports. Hockey in autumn, basket-ball in winter, baseball in spring. Suitable in strength for A-B girls.
- 22-23. Sophomore Elementary Swimming. 22, Elementary. 23, Low intermediate.
- 28-29. Sophomore Advanced Swimming. 28, High intermediate. 29, Advanced.
31. General Swimming. For both beginners and advanced swimmers and divers. Shower bath tickets may be bought of the matron. No registration necessary.
- 37-38-39. Freshman Major Sports.
- 43-44-45. Play and the Playground. Graded games, folk dances, and track for school and playground, two hours. A consideration of the nature and function of play and practical conduct of playground, one hour. Written abstract of prescribed reading.
- 32-33-34. Hockey, Basket-Ball, and Baseball. Hockey in autumn, basket-ball in winter, baseball in spring.
- 49-50. Gymnastics for Freshmen. An introduction to gymnastics, marching, and apparatus work.
- 51-52. Gymnastics for Sophomores. Gymnastics, marching, and apparatus work.
- 54-55. Gymnastics for Juniors. Gymnastics, marching, and apparatus work.
- 56-57. Swimming with Technique. Description of strokes, methods of teaching, practice in teaching and life-saving.
- 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.
- 60-61. Minor Sports with Technique. Description and methods of teaching, one hour; practical work, two hours.
- 63-64-65. Major Sports with Technique. Hockey, practice and technique, two hours. Basket-ball, discussion and demonstration, one hour. Baseball, one hour technique, two hours practice.
- 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.
- 69-70-71. Advanced Interpretive Dancing with Technique. Technique and methods of teaching one hour, practical work, two hours.
75. History of Physical Education. A historical survey of physical education beginning with that of Greece and including contemporary developments.

76. Physical Diagnosis and Prophylaxis. A consideration of certain diseases and injuries, their symptoms, significance, and prevention. Approaches from the standpoint of guidance for the teacher.
- 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 gymnastic movements and their efforts.
82. Physical Examination. Study of all the important anthropometric measurements, and practical application of them in the laboratory.
83. Technique of Gymnastic Teaching. Lectures and quizzes on terminology, and technique of teaching. Practice in teaching within departmental groups.
84. Principles of Gymnastics. A study of the biological and educational aspects of physical training, with reference to its place in education. Principles of progression are studied. The practical work, 3 periods a week, will represent an application of the lecture work.
- 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.
87. Personal and School Hygiene. Deals with the correlation of physical education with daily habits of living, and a study of the health problems related to the life of the school child.
- 88-89-90. Orthopedic and Remedial Gymnastics. Lectures, demonstrations, individual work with cases. Discussion held relative to the various defects met with and treatment outlined.
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.
- 92,93,94,95,96. Practice Teaching. Includes practice teaching in gymnastics, major sports, organized games, interpretive dancing, swimming. University, University High School, public schools, and municipal playgrounds afford the practice material. All students required to teach on municipal playground during two weeks of summer vacation, preferably after junior year.
97. Organization and Administration. Problems of city and state supervision, construction and equipment, adaptation to environment, the teacher's instructional and non-instructional burden, professional ethics.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

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.

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.
54. Public Health Methods and Practice. School health work; supervision of water and milk supplies; epidemiology; sanitation; vital statistics; health services; industrial clinics; health education; state and local health organizations at work. (Not offered in 1924-25.)
58. Maternal and Child Hygiene. The maternal welfare program; importance of breast feeding, origin and conduct of infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders.
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.
- 60w. 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.
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. Psychology 1-2. 12 hours; 1 credit.
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. Prerequisites: Biology 1-2; Psychology 1-2. 36 hours, 3 credits.

PUBLIC SCHOOL MUSIC

- 51-52-53. Instrumentation. (Junior, three quarters.) Theoretical study of orchestral and band instruments. Observation of local organizations for timber and color.
- 54-55-56. Advanced Instrumentation. (Senior, three quarters.) Examination, revision, and scoring of material suitable for school orchestra of more advanced orchestral organizations. Detailed study of bowing, fingering, score-reading, phrasing, and interpretation.
- 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.
- 81-82-83. Observing and Teaching. (Senior year, three quarters.) Observation and practice teaching in the high schools, city, and University, under supervision.

29. Grade School Methods. First term. Piano class-teaching. Practical methods of teaching piano classes, and theory underlying the methods. Practice teaching with the class and with classes of children. This is also a good course in practical schoolroom teaching.
30. Grade School Methods. Second term. Methods of teaching vocal music in the kindergarten and in the first five grades. Theory and practice of teaching combined in class work. Students required to observe and teach classes in the Minneapolis public schools three hours weekly.
31. Grade School Methods. Third term. Same as above for grades six, seven, eight, also a short course in voice-training for child and adult.
32. High School Methods. First term. Organization of junior high and high school music. Methods and material used in the chorus, glee clubs, of the modern high school. Pupils will be required to observe in the Minneapolis high schools.
33. High School Methods. Second term. Students will learn to apply methods of high school music teaching by practical work with the class itself. They will be required to teach in the Minneapolis high schools three hours weekly.
34. Voice. A practical course in class voice-teaching, in the use and care of the child voice, the changing voice, the adult voice. Testing and classification of voices in upper grades and high schools. Voices of all ages will be used for demonstration.
- 71-72-73. Class Instrument-Teaching. Fall quarter, beginner's classes in violin, viola, cello, and bass; winter quarter, beginner's classes in flute, oboe, clarinet, and bassoon; spring quarter, beginner's classes in all brass and percussion instruments.
- 74-75-76. Advanced Class Instrument Teaching. Practical orchestral routine augmenting University High School Orchestra, under baton of the director and members of class in Orchestra-Conducting, 64,65,66.

SCHOOL LIBRARY ADMINISTRATION

7. School Library Organization and Routine. Instruction in making and using simple library records, keeping books in order and repair, with practice in preparing books for the shelves, mending, etc. One hour class work, three hours practice work.
8. Choice and Use of Reference Materials for a School Library. Study of reference books, periodicals, documents, etc., useful in a school library. A few lessons are included on the principles of classification, and on the making of a simple author and title catalog. Two hours' class work, three hours' practice work in library.
9. Book Selection for the High School Library. Aims to give practical acquaintance with a variety of literature for adolescents. Two hours' class work, three hours' practice work in library.

THEORY AND PRACTICE OF TEACHING

GENERAL METHODS

15. Technique of High School Instruction. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; methods of treating individual differences; classroom management; the professional ethics of teaching; supervised study; marking systems; etc.; observation of high school work.
16. Practice Teaching.* Teaching under supervision in the University High School and in the Minneapolis city schools, in the regular secondary school subjects. The course calls for one period daily at the school where the work is assigned.
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.

SPECIAL METHODS

18. Teachers' Course in Animal Biology. Nature study.
19. Teachers' Course in Botany. A course dealing with the principles and methods of teaching botany in high schools.
20. Teachers' Course in Chemistry. A consideration of the fundamental principles of chemistry with practical reference to the teaching of chemistry in the high school. Discussion of such topics as training of the teacher, laboratory equipment, etc.
21. Teachers' Course in English. Methods of teaching English in high schools. Required of all students preparing for a teacher's certificate in English. (Not offered in 1924-25.)
22. Teachers' Course in French. Methods of teaching French in high schools, courses of study, textbooks, etc. Lectures, observations, and reports. Open to juniors and seniors qualifying for a certificate to teach French as a major or minor subject. Credit in education only.
23. Teachers' Course in Geography. Open to juniors and seniors qualifying for a certificate to teach geography in high schools.
24. Teachers' Course in German. Discussion of aims and methods of teaching German in secondary schools; reading and reports; arrangement of courses of study and discussion of texts based upon aims; visiting classes. The use of language tests.
25. Teachers' Course in History. Open only to students who have 18 credits in history, including one intensive course. Deals chiefly with the practical problems of teaching history and government in the

* Arrangements for practice teaching should be made with directors as follows:
 Agricultural Education—A. V. Storm
 Home Economics—Clara Brown
 All other subjects—C. W. Boardman

Applications for practice teaching should be made before the close of the quarter immediately preceding the quarter in which the practice teaching is to be done.

- secondary schools. Students planning to teach government must have 9 credits in political science.
26. Teachers' Course in Latin. Class drills and discussion of various problems connected with secondary school work in Latin.
 27. Teachers' Course in Mathematics. For students preparing to become teachers of secondary school mathematics. Lectures, readings, discussions, methods of presentation, assignments, lesson plan, examinations, plans of beginning courses in elementary algebra and plane geometry.
 28. Junior High School Mathematics. Mathematics in the junior high school. Lectures, readings, discussions, methods of presentation, assignments, lesson plans, etc. (Not offered in 1924-25.)
 35. Teachers' Course in Norwegian. For students who expect to teach Norwegian in the high schools.
 36. Teachers' Course in Physics. Intended to embrace fundamental conceptions of methods of teaching high school physics. Special emphasis put upon laboratory side of subject. One year of college physics will be considered as a prerequisite for this course.
 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.
 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.
 39. Social Science for Junior High Schools.
 40. Teachers' Course in Spanish. Methods of teaching Spanish in the high schools. Courses of study, textbooks, etc. Lectures, observation, and reports. Open to juniors and seniors qualifying for a certificate to teach Spanish as a major or minor subject. Credit in education only.
 41. Teachers' Course in Swedish. For students who expect to teach Swedish in the high schools.
 42. Fundamental Educational Theories Relating to Instruction in the Elementary School. A study of current educational concepts as related to problems of the elementary school. (Not open to students who have had Ed. 160.)
 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.
 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.
 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.

46. Practice Teaching with Special Methods. 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. (Not open for credit to graduates of two-year normal school courses.)
47. Field Problems in High School 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. (Not offered in 1924-25.)
- 48w. Teachers' and Supervisors' Course in Arithmetic for Lower Grades. The course emphasizes arithmetical history as related to present practices, courses of study, methods of teaching, motivation, games, projects, problems, integers, and common fractions.
- 49s. Teachers' and Supervisors' Course in Arithmetic for Intermediate and Upper Grades. The course emphasizes arithmetical history as related to present practices, courses of study, methods of teaching, motivation, projects, problems, and all topics included in intermediate and upper grades and junior high school.
- 50w-s. Normal School Teaching and Administration. Emphasis is placed on historical development, the present status, and problems of future development. Study is made of curriculums, departmental organizations, practice teaching, and costs. Emphasis is also placed on supervision of instruction.
51. The Teaching of English in the Junior High School. Practical methods for classroom presentation of literature and composition in the junior high school. Projects in composition and literature. Group method for large classes. Place of grammar, punctuation, spelling. Survey of the literature on the subject.
- 52-53-54. Teachers' Course in English and Practice Teaching. A combination of the Teachers' Course in English with practice teaching. Arrangements must be made with the instructor at the beginning of the fall quarter.

COURSES OPEN TO GRADUATE STUDENTS

118. Problems in Junior High School English. Study of the problems in teaching, reading, literature, and composition in upper grammar grades and junior high schools.
193. Foundations of Secondary School Methods. A study of the investigations which form the bases of the technique of high school instruction, and the application of their results to high school subject-matter and to high school classroom procedure.
195. Problems of High School English Teaching. An intensive study of various means of adapting subject content to high school pupils; observations; classroom experiments; conferences with classroom teachers; pupil advisory work; submission of proposals of special methods.
- 222-223-224. Seminar in the Technique of High School Instruction.
- 225-226-227. Seminar in Elementary School Problems.

METHODS COURSES IN AMERICANIZATION

128. Technique of Teaching Adults. Methods of teaching adults—the foreign-speaking, the illiterate, the fatigued—in keeping with the dignity of mature years, and the mental processes of mature minds of foreigners.
129. Methods of Americanization. Practical methods of Americanization in use in the United States, together with facts and conditions of their success and failure.
- 131-132-133. Supervised Americanization Work. Practical field work among foreign peoples in our vicinity.

TRADE AND INDUSTRIAL EDUCATION

- Ind.10. Methods, Elementary Wood Work. This course is primarily a methods course. A very important part of the course is demonstration work by the students. The course also involves uses and care of tools, tool processes, and uses and care of wood-working machinery.
- Ind.11. Methods, Primary Grade Wood Work. This course is designed primarily for primary grade teachers and teachers of subnormal children. The course consists of lectures and shop work. The shop work is divided into three parts: *flat piece* work, *assembled* and movable parts, and toy furniture.
- Ind.12. Methods, Elementary Electric Wiring. This course consists of bell wiring, elementary inside electrical wiring, fundamental electrical laws, blue print reading and estimating. Methods of presenting this work to a class is a very important part of the work.
- Ind.14. Methods, Mechanical Drawing. A very important part of the course is the demonstration work by the students. The course consists of conventions, perspective, isometric, orthographic, working drawings and tracing and blue printing.
- Ind.20. Industrial History. Lectures, quizzes, and required readings. Evolution of arts, industry, tools, processes, and production to 1800; evolution in economic and social conditions; culmination of the industrial revolution in America—resultant agricultural, industrial, economic, and social problems; twentieth century outlook and opportunities; implications for practical education.
- Ind.25. Literature of Industrial Education. Acquaintance and methods of use. Survey of useful books, reports, periodicals, and special bulletins. Students made familiar with reference facilities. Individual term assignments to teach sources, note-taking, organization, and the preparation of papers.
- Ind.30. Graphic Presentation. Study of typical methods of graphic representation of data. The use of simple educational and social materials for drill in the interpretation and statement of facts and conditions.
- Ind.40. Occupational Analysis. Necessity for, and types of, analyses, survey of those available. Individual work upon a chosen occupation—breakups, classification of materials, and their organization for teaching purposes. (Not offered in 1924-25.)

- Ind.41. Job Analysis. Relation to occupational analysis. Jobs reduced to operations. These examined for skills, physical demands, information, time study, fatigue and safety factors, and teaching order. Individual work, under guidance, within any field familiar to a student. Class criticism.
- Ind.42. Selection of Related Materials. Makes definite use of occupation analyses prepared in Courses Ind.40 and Ind.41. Content of related courses determined and arranged. Reference materials collected and application charts prepared. (Not offered in 1924-25.)
- Ind.50-51-52. Practice Teaching. Three quarters required. During each quarter the group to meet for not less than four two-hour periods for lectures and the making of lesson plans. Instructor to visit persons enrolled (at their places of employment) to criticize and help and to determine grade of ability. Students not on the part time basis to be assigned to practice work in the University High School, Dunwoody Industrial Institute, or the public schools of the Twin Cities.
- Ind.60. Social Agencies in Education. An evaluation of various social agencies that make educational contributions; their status, aims, achievements, and deficiencies; their relationships and possible fields of cooperation. The special significance of social agencies to vocational education under public support and control.
- Ind.61. Social Significance of Industrial Education. A study of the basic facts of economics and sociology which support efforts in the organization and administration of industrial education. Review of the movements which contributed to its introduction and development. Its social value and results.
- Ind.65. Methods, 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, Related Subjects. Theory, practices, and problems of related instruction; application charts in mathematics, drawing, science, and safety; group-study and unit-course preparation; usable methods and the means of supervision. Both incidental and scheduled teaching considered.
- Ind.70. Methods, Shop Subjects. Various methods of conducting shop classes, with and without reference to production work; lesson plans, grading, reports, and records; the assigning of jobs and shop management; standards of workmanship.
- Ind.80. General Industrial Training. Organization and supervision of the industrial offering for grades and high school in typical Minnesota towns. Aims of the work, offerings, and schedules, teaching fitness, equipment, methods, and management. Consideration of the unifying opportunities within a department and a school.
- Ind.150-151-152. Seminar in Vocational Education. Survey of studies in the field, individual and group investigation, reports, and criticisms. Required of all students writing theses in this special field.

- Ind.171. Administration of Industrial Education—Day Schools. National, state, and local organization and support of day industrial schools; adaptable types, buildings, and equipment, promotion and advertising, co-operative agreements and relationships, supervision of instruction, student placement. General versus unit course organization. Relation to part time and evening instruction.
- Ind.172. Administration of Industrial Education—Evening Schools. Development of the after training of adults; agencies and scope of the movement; state supervision, national and state legislation; qualifications of instructors, problems and difficulties, records and certification, fees and charges; buildings, equipment, and instruction facilities. General versus unit course organization. Costs.
- Ind.173. Administration of Industrial Education—Part Time Classes. A study of the new movement for part time education. Social and economic background, methods of organizing classes, a study of the special student groups, courses of study. Typical schools, comparative state legislation and plans. Minnesota's problems.

NOTE.—Shop courses in wide variety are offered in the College of Engineering. An agreement between the Dunwoody Industrial Institute and the University makes it possible for credit work to be done at Dunwoody, if registration is made at the University. Candidates for degrees should keep in mind the fact that 45 credits is the limit set for shop and drawing work.

*The Bulletin
of the University of
Minnesota*

The College of Education

Part II

*Announcement of Program for the Year
1925-1926*



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1925							1926													
JULY							JANUARY							JULY						
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa
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AUGUST							FEBRUARY							AUGUST						
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30	31
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NOVEMBER							MAY							NOVEMBER						
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27	28	29	30	31	27	28	29	30	26	27	28	29	30	31	..
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UNIVERSITY CALENDAR

1925-26

September	17	Thursday	Payment of fees closes, except for new students
September	17-19		Entrance examinations
September	21-25		Examinations for removal of conditions
			Physical examinations for all new students
			Registration period for new students ²
September	25	Friday	Payment of fees for new students closes
September	25-26		Necessary changes in registration
September	26	Saturday	Optional examinations in English

FALL QUARTER

September	28	Monday	Fall quarter begins, 8:30 ¹ a.m.
October	15	Thursday	Senate meeting, 4:30 p.m.
November	11	Wednesday	Armistice Day; a holiday
November	14	Saturday	Homecoming Day
November	26	Thursday	Thanksgiving Day; a holiday
December	3	Thursday	State Day Convocation
December	16-19		Final examination period
December	17	Thursday	Commencement Convocation
			Senate meeting, 4:30 p.m.
December	19	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	23	Wednesday	Payment of fees closes for all students in residence fall quarter

WINTER QUARTER

December	31	Thursday	Registration day for new students ²
January	2	Saturday	Necessary changes in registration
January	4	Monday	Christmas vacation ends, winter quarter begins, 8:30 ¹ a.m.
February	12	Friday	Lincoln's Birthday; a holiday
February	18	Thursday	Charter Day Convocation
			Senate meeting, 4:30 p.m.
February	22	Monday	Washington's Birthday; a holiday
March	17-20		Final examination period
March	18	Thursday	Payment of fees closes for all students in residence winter quarter
March	20	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

¹ First hour classes begin at 8:00 in the Medical School and at 8:15 at University Farm.

² Registration subsequent to the date specified will necessitate the approval of the assistant dean for students' work. See also penalty fees for late registration, General Information, section 13, Science, Literature, and the Arts bulletin, Part I.

CALENDAR

SPRING QUARTER

March	26	Friday	Registration day for new students ²
March	26-27		Necessary changes in registration
March	29	Monday	Spring vacation ends, spring quarter begins, 8:30 ¹ a.m.
April	2	Friday	Good Friday; a holiday
May	13	Thursday	Cap and Gown Day Convocation
May	20	Thursday	Senate meeting, 4:30 p.m.
May	31	Monday	A holiday (May 30, Sunday, Memorial Day)
June	9-12		Final examination period
June	12	Saturday	Spring quarter closes, 5:20 p.m.
June	13	Sunday	Baccalaureate service
June	14	Monday	Fifty-fourth annual commencement

SUMMER SESSION

June	18-19		Summer Session first term begins, registration and payment of fees
June	21	Monday	Classes begin, 8:00 a.m.
July	31	Saturday	Registration and payment of fees for second term closes
			First term Summer Session closes
August	2	Monday	Second term classes begin
September	4	Saturday	Second term Summer Session closes

¹ First hour classes begin at 8:00 in the Medical School and at 8:15 at University Farm.

² Registration subsequent to the date specified will necessitate the approval of the assistant dean for students' work. See also penalty fees for late registration, General Information, section 13, Science, Literature, and the Arts bulletin, Part I.

COLLEGE OF EDUCATION

PROGRAM

GENERAL COURSES

No.	Title	Hour	Day	Room	Instructor
208f	Methods in Ed. Research..... (2 cred.; grad.)	I, II	S	113Ed	Mr. Haggerty, Mr. Olson
228f-229w-230s	Problems of College Education..... (6 cred.; grad.)	7:30-9:30 p.m.	M	Ar	Mr. Haggerty

ADMINISTRATION AND SUPERVISION

Major Advisers: L. J. Brueckner, Fred Engelhardt, L. V. Koos

No.	Title	Hour	Day	Room	Instructor
65f,w	The High School..... (3 cred.; jr., sr.; prereq., Ed. 55)	III	TThS	204Ed	Mr. Koos
65s	The High School..... (3 cred.; jr., sr.; prereq., Ed. 55)	III	TThS	204Ed	Mr. Boardman
113f	High School Curriculum..... (3 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	VIII	MWF	112Ed	Mr. Hudelson
115f,w,s	Practice Supervision (3 cred.; sr., grad.)	Ar	Ar	Ar	Mr. Brueckner, Mr. Peik
119f	Elementary School Curriculum..... (3 cred.; sr., grad.; prereq., 1, 3)	I	MWF	ArEd	Mr. Peik
119Tf-120Tw	Elementary School Curriculum..... (4 cred.; sr., grad.; prereq., 1, 3)	I, II	S	113Ed	Mr. Peik
121W	Educational Advising of Women and Girls (3 cred.; jr., sr., grad.; prereq., 15 qtrs. cred. in ed. and psy.)	Ar	Ar	Ar	Miss Blitz
123s	Supervision of High School Instruc- tion (3 cred.; sr., grad.; prereq., 10 hrs. in education)	VIII	MTh	ArEd	Mr. Koos
124f	Educational Administration..... (3 cred.; sr., grad.; prereq., 10 hrs. in education)	IX	MWF	205Ed	Mr. Engelhardt
124aw-124bs	Educational Administration..... (4 cred.; sr., grad.; prereq., 10 hrs. in education)	III, IV	S	ArEd	Mr. Peik
125w-126s	City School Administration..... (6 cred.; sr., grad.; prereq., Ed. 124, 111)	IX	MWF	205Ed	Mr. Engelhardt
127s	<i>The School Superintendent...</i> (2 cred.; sr., grad.; prereq., 10 hrs. in education)	<i>Not offered in 1925-26.</i>			
128f,w,s	Special Problems in Educational Ad- ministration (1 or 2 cred.; prereq., Ed. 124-125- 126)	Ar	Ar	Ar.	Mr. Engelhardt

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
160f	Principles of Supervision..... (2 cred.; sr., grad.; prereq., 15 or equivalent)	III, IV	S	ArEd	Mr. Brueckner
161bf	Elementary School Supervision..... (2 cred.; sr., grad.; prereq., 15 or equivalent)	VIII, IX	W	ArEd	Mr. Peik
161as	Supervision: Uses of Ed. Tests in Improving Instruction (2 cred.; sr., grad.; prereq., 15 or equivalent)	III, IV	S	ArEd	Mr. Brueckner
162w	Elementary School Supervision..... (3 cred.; sr., grad.; prereq., 15 or equivalent)	II	TThS	ArEd	Mr. Brueckner
164f	High School Administration..... (3 cred.; sr., grad.; prereq., 10 hrs. in education including Ed. 55)	I	TThS	ArEd	Mr. Koos
167w-168s	Junior High School..... (4 cred.; sr., grad.; prereq., 10 hours in education including Ed. 55)	IX, X	W	Ar	Mr. Koos
175s	City School Finance..... (3 cred.; sr., grad.; prereq., 124, 125)	VIII	MWF	205Ed	Mr. Engelhardt
178f-179w	School Surveys (6 cred.; sr., grad.)	VIII	MWF	ArEd	Mr. Engelhardt
205f-206w-207s	Seminar in Ed. Admin..... (6 cred.; grad.; prereq., 124, 125- 126, 160-161-162)	Ar	Ar	Ar	Mr. Engelhardt
218f-219w-220s	Seminar in Secondary School Prob- lems (6 cred.; grad.)	IX, X	Th	111Ed	Mr. Koos

AGRICULTURAL EDUCATION

Major Adviser: A. V. Storm

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
11f,s	Principles of Vocational Education... (3 cred.; jr., sr.; § no prereq.)	I	MWF	317Ad	
11w	Principles of Vocational Education... (Same as 11f)	II	TThS	317Ad	
21f	Vocational Education (3 cred.; jr., sr.; no prereq.)	III	TThS	307Ad	Mr. Mayne
41f,w,s	Apprentice Teaching (2 cred.; jr., sr.; §¶ prereq., 131)	Ar	Ar	Ar	Mr. Field, Mr. Nylin, Mr. Lathrop
42f,w,s	Teaching (3 cred.; jr., sr.; §¶ prereq., 41)	Ar	Ar	Ar	Mr. Field, Mr. Lathrop, Mr. Nylin
75f,s	Visual Presentation (3 cred.; jr., sr.; prereq., 11)				
	Lect.	VI	M	317Ad	
	Lab.	VI, VII	WF	317Ad	

§ Offered only to those preparing to teach.

¶ Registration limited. Students are admitted to this course only when approved by Mr. McIntosh.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
81s	Extension Work (3 cred.; jr., sr.; prereq., 6 cred. in farm mgt., 6 cred. in farm crops, 15 cred. in an. ind., 6 cred. in agr. educ.)	VI	MWF	4Ad	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		<i>Not offered in 1925-26.</i>		
131w,s	Methods in Teaching High School Agriculture	III	MTWThF	317Ad	Mr. Field
141w,s	Supervised Practice in Vocational Agriculture	Ar	Ar	Ar	Mr. Lathrop
151w,s	Organization and Management.....	IV	MTWFS	317Ad	Mr. Storm, Mr. Lathrop
153f,s	Consolidated Rural Schools.....	Ar	Ar	Ar	Mr. Dyer
154	Rural Education and Community Life (3 cred.; jr., sr.; prereq., 11)	Ar	Ar	Ar	Mr. Dyer
155	Consolidated Rural School Problems.. (3 cred.; jr., sr.; prereq., 11, 153 or equiv.)	Ar	Ar	Ar	Mr. Dyer
171w,s	Problems in Procedure.....	Ar	Ar	Ar	Mr. Lathrop
176s	Problems in Visual Presentation..... (3 cred.; jr., sr.; prereq., 75)	Ar	Ar	Ar	
191f-192w-193s	Seminar in Agricultural Education... (6 cred.; sr.; prereq., 11 cred.)	Ar	Ar	Ar	Mr. Storm, Mr. Lathrop, Mr. Field

ART EDUCATION

Major Adviser: Ruth Raymond

FUNDAMENTAL PRINCIPLES OF DESIGN

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s	Fund. Principles of Design..... (9 cred.; no prereq.) Sec. 1	(II) III (IV)	TThS	404F	Miss Raymond,
1f	Fund. Principles of Design..... (3 cred.) Sec. 2	II (III) (IV)	TThS	406F	

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

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

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

§ Offered only to those preparing to teach.

¶ Registration limited. Students are admitted to this course only when approved by Mr. McIntosh.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
20f-21w-22s	Principles of Harmony in Form and Color	(I) II (III)	TThS	401F	Mr. Hilpert, Miss Sutorius
	(9 cred.; soph., jr., sr.; prereq., 2, 3)				
50w-51s	Commercial and Industrial Design (6 cred.; jr., sr.; prereq., 1, 2, 3, 4, 5, 7, 8, 9, or arranged)	VI(VII)(VIII)	MWF	402F	Mr. Hilpert
53f	<i>Design for the Consumer</i>	<i>Not offered in 1925-26.</i>			
	(3 cred.; jr., sr.; prereq., 1, 2, 3, 7, 8, 9, and 20, 21, 22 or 50, 51)				
54w	Design for the Consumer.....	VI	MWF and ar		Miss Raymond
	(See 53f)				
55f-56w-57s	<i>Fundamental Art Principles</i>	<i>Not offered in 1925-26.</i>			
	(6 cred.; all; no prereq.)				
DRAWING					
4f,5w,6s	Still Life Drawing.....	(I)(II)(III)(IV)	W	404F	Miss Sutorius
	(3 cred.; all; no prereq.) (Limited to 20)				
7f,8w,9s	Sketch	I, II, III, IV	F	401F	Miss Sutorius, Miss Raymond
	(3 cred.; no prereq.) (Limited to 25)	VI, VII	MW	401F	
10f,11w,12s	Composition				
	(3 cred.; all; no prereq.) (Limited to 25)				
	Sec. 1	II, III (IV)	M	406F	Miss Raymond
23f,24w,25s	Water Color	(I) II, III (IV)	M	406F	Mr. Hilpert
	(3 cred.; soph., jr., sr.; prereq., 4f, 5w, 6s) (Limited to 20)				
26f,27w,28s	Charcoal, Pencil, Pen Techniques...	II, III (IV)	W	406F	
	(3 cred.; soph., jr., sr.; prereq., 4f, 5w, 6s) (Limited to 20)				
29f-30w-31s	Sketch from Pose.....	(I)(II)(III)(IV)	F	402F	Mr. Hilpert
	(3 cred.; soph., jr., sr.; prereq., 7, 8, 9)	(VI) (VII)	MW	401F	
60f,61w,62s	Advanced Water Color.....	Ar	Ar	Ar	Mr. Hilpert
63f,64w,65s	Advanced Techniques	Ar	Ar	Ar	
66f,67w,68s	Advanced Sketch	Ar	Ar	Ar	Mr. Hilpert
HANDICRAFTS					
32w	Cardboard and Paper Construction..	VII (VIII)	MW	404F	Miss Ross
	(1 cred.; all; no prereq.) (Limited to 20)				
33w	Bookbinding	VI, VII (VIII)	TTh	406F	Miss Ross, Miss Sutorius
	(2 cred.; all; no prereq.) (Limited to 20)	(VI) VII, VIII	TTh		
35f	<i>Clay-Modeling</i>	<i>Not offered in 1925-26.</i>			
	(1 cred.; all; no prereq.)				
37f	Elementary Weaving, Basketry.....	(V) VI (VII)	TTh	406F	Miss Ross, Miss Sutorius
	(2 cred.; all; no prereq.)				
38f	Allied Crafts	(VI) VII (VIII)	W	406F	Miss Ross, Miss Sutorius
	(1 cred.; all; no prereq.) (Limited to 15)				
39su	Advanced Basketry	Ar	Ar		Miss Ross
40su	Advanced Weaving	Ar	Ar		Miss Ross

PROGRAM

No.	Title	Hour	Day	Room	Instructor
41f	Elementary Pottery (2 cred.; all; no prereq.) (Limited to 15)	(VI)VII(VIII)	MF	411F	Miss Ross, Miss Sutorius
42w	Advanced Pottery (2 cred.; all; prereq., 38) (Limited to 10)	(V) VI (VII)	MWF	411F & kiln room	Miss Ross, Miss Sutorius
43s	Advanced Pottery Continued (2 cred.; soph., jr., sr.; prereq., 38, 46)	Not offered in 1925-26.			
44s	Application of Design to Fabrics... (2 cred.; all; prereq., 29, 30)	VI, VII (VIII)	TTh	404F	Miss Ross
45w	Application of Design to Needle- craft (2 cred.; soph., jr., sr.; prereq., 29, 30, 31)	(VII) VIII	TTh	406F	Miss Sutorius
46s	Metal Work (2 cred.; soph., jr., sr.; prereq., 29, 30, 31)	(VI)(VII)VIII	MWF	406F	Miss Ross
	ART HISTORY AND APPRECIATION				
70	Art of the Italian Renaissance.... (2 cred.; soph., jr., sr.; prereq., 9 cred. in design)	Not offered in 1925-26.			

TEACHER-TRAINING

80f,81w,82s	Types of Art Instruction..... (3 cred.; jr., sr.; prereq., 12 cred. in design, 12 cred. in drawing, 6 cred. in handicraft)	(VII) (VIII)	TTh	403F	Miss Raymond
		IV	S	402F	
83s	Teacher's Course in Art..... (3 cred.; jr., sr.; prereq., 12 cred. in design, 12 cred. in drawing, 6 cred. in handicraft)	VI(VII)(VIII)	MWF	402F	Miss Raymond
86f,87w,88s	Practice Teaching in Art.....	VI, VII, VIII	TTh	Public schools	Miss Raymond

EDUCATIONAL PSYCHOLOGY

Major Advisers: M. E. Haggerty, W. S. Miller

No.	Title	Hour	Day	Room	Instructor
55f	Educational Psychology (3 cred.; jr., sr.; prereq., 6 cred. in psychology)	I	MWF	Psy	Mr. Miller
55w,s	Educational Psychology (See 55f)	I	MWF	Psy	Mr. Miller
55Tf-56Tw	Educational Psychology (for Teach- ers) (4 cred.; jr., sr.; prereq., 6 cred. in psychology)	III, IV	S	Psy	Mr. Olson
57f	Ontogenetic Psychology (3 cred.; jr., sr.; prereq., 6 cred. in psychology)	IX X	TTh T	Psy	Mr. Olson

NOTE.—Hours in parentheses are laboratory hours and may be adjusted in individual cases.

NOTE.—Handicraft courses are especially recommended to those desiring training for occupational therapy or other forms of social service.

NOTE.—Courses for public school teachers.—Courses equivalent to parts of those listed above in design, drawing, and the handicrafts will be offered on Saturday mornings, if there is sufficient demand. Those interested should consult with the Art Education faculty.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
106f-107w-108s	<i>Advanced Educational Psychology</i> .. (9 cred.; jr., sr., grad.; prereq., 55 or equiv.)	Not offered in 1925-26.			
111s	Educational Diagnosis.....	II	MWF	Psy	
	(3 cred.; jr., sr., grad.; prereq., 55 or equiv.)				
111Tf-112Tw	Ed. Diagnosis (for teachers).....	I, II	S	Psy	Mr. Turney
	(4 cred.; jr., sr., grad.; prereq., 55 or equiv.)				
116f	Elementary Statistical Methods....	III, IV	S	Psy	Mr. Von Borgers- rode
	(2 cred.; jr., sr., grad.)				
117w-118s	Advanced Statistical Methods in Education	IX, X	T	Psy	
	(4 cred.; sr., grad.; prereq., 126)				
130s	Vocational Psychology	IX, X	F	115Psy	Mr. Paterson
	(2 cred.; jr., sr.; prereq., Psy. 1, 2 or 6 and 4 additional credits in economics, education, or psychol- ogy)				
134f-135w-136s	Mental Tests and Mental Diagnosis (6 cred.; sr., grad.; prereq., 55 or equiv.)	VII, VIII	MW	Psy	Mr. Miller
134af-134bw	Mental Tests and Mental Diagnosis (2 cred.; sr., grad.; prereq., 55 or equiv.)	I, II	S	Psy	Mr. Miller
138w-139s†	Experimental Educational Psychol- ogy	IX, X	WF	Psy	Mr. Turney
	(4 cred.; sr., grad.; prereq., 55 or equiv.)				
143f-144w†-145s	Individual Mental Examination....	I, II	S	Psy	Mr. Turney
	(6 cred.; sr., grad.; prereq., 55 and 111 or 134. Permission of in- structor)				
149f-150w†-151s	Psycho-Educational Clinic	Ar	Ar	Ar	Mr. Rockwell, Mr. Turney
	(2 to 6 cred.; sr., grad.; permission of instructor; prereq., Ed. 134-135- 136, 144-145 or 184, and 111)				
153f-154w-155s	Research Problems	Ar	Ar	Ar	Mr. Haggerty, Mr. Miller
	(Ar.; sr., grad.; prereq., consult instructor)				
184s	Mental Deficiency	III, IV	S	Psy	Mr. Rockwell
	(2 cred.; jr., sr., grad.; prereq., 55 or equiv.)				
191w	Systematic Ed. Psychology.....	III	MTThF	Ar	Mr. Haggerty
	(4 cred.; sr., grad.; prereq., 12 credits in psy. and ed. psy.) (Not open to students receiving credit for Ed. Psy. 106-107-108)				
192w-193s	The Psychology of Behavior Prob- lems in Children.....	III, IV	S	Psy	Mr. Blanton
	(4 cred.; jr., sr., grad.; prereq., 15 cred. in psy. and ed.)				

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
197f-198w-199s	Seminar: Problems of Subnormality. (6 cred.; jr., sr., grad.)				Not offered in 1925-26.
201f-202w-203s	Seminar in Ed. Psychology (No cred.; grad.)	IX, X		M Ed	Mr. Haggerty, Mr. Miller, Mr. Rockwell

HISTORY AND PHILOSOPHY OF EDUCATION

Major Advisers: Miss Alexander, Mr. Finney

No.	Title	Hour	Day	Room	Instructor
1f	Brief Course in History of Education (5 cred.; jr., sr.; prereq., 6 cred. in psychology)				
	Sec. 1	II	MTWThF	210OL	Miss Alexander
	2	IV	MTWFS	210OL	
1w,s	Brief Course in History of Education (See 1f)	II	MTWThF	210OL	Miss Alexander
3f	Educational Sociology (Psychology) (3 cred.; jr., sr.; prereq., 6 cred. in psychology)				
	Sec. 1	II	MWF	208OL	Mr. Finney
	2	III	MWF	208OL	Mr. Finney
3w,s	Educational Sociology (See 3f)	III	MWF	210OL	Mr. Finney
5s	Public Education in the U. S. (Offered at U Farm) (3 cred.; jr., sr.; prereq., 6 cred. in psychology)	VIII	MWF	Ar	Miss Alexander
101f	Found. of Mod. Ed. (3 cred.; jr., sr., grad.; prereq., 6 cred. in psychology and 6 cred. in history)	VIII	MWF	208OL	Miss Alexander
102w	Hist. of Mod. Secondary and Higher Education (3 cred.; jr., sr., grad.; prereq., 6 cred. in psychology and 6 cred. in history)	VIII	MWF	208OL	Miss Alexander
103s	Hist. of Mod. Elem. Education (3 cred.; jr., sr., grad.; prereq., 6 cred. in psychology and 6 cred. in history)	VI	MWF	208OL	Miss Alexander
140w-141s	Topics in the History of Education (6 cred.; sr., grad.; prereq., permission of instructor)	VI, VII VI	W F	ArOL	Mr. Krey
187f-188w-189s	Seminar in Educational Sociology (6 cred.; grad.; prereq., Ed. 1 or 101-102-103 and 3)	I, II	S	206OL	Mr. Finney

COLLEGE OF EDUCATION

HOME ECONOMICS EDUCATION

Major Adviser: Wylle B. McNeal

No.	Title	Hour	Day	Room	Instructor
40f	Child-Training				
	(3 cred.; jr., sr.; prereq., Prev. Med. 52 or parallel, Psy. 1-2)				
	Sec. 1	IV	MWF	203HE	
	2	V	MWF		
	3	VIII	MWF		
42f,w,s,	Special Methods of Teaching Home Economics	VIII	MTWThF	213HE	Miss Clara Brown, Miss Rivers
	(5 cred.; jr., sr.; prereq., H.E. 13, 22, Psy. 1-2, Agr. Ed. 11 or 55)				
43w	Organ. & Methods for Related Art Teaching	III	TThS	402HE	Miss H. Goldstein
	(3 cred.; jr., sr.; prereq., H.E. 42 or parallel 52, 131 or parallel)				
46f,w	Observation and Teaching: Related Art				
	(8 cred.; sr.; prereq., 42, 43 or parallel H.E. 13 and 53)				
	Lect.	IX	TTh	213HE	Miss Clara Brown
	Teaching	Ar	Ar	Ar	
47f,w,s	Observation and Teaching: Foods and Home Management.....				
	(8 cred.; sr.; prereq., H.E. 34, 35, 42)				
	Lect.	IX	TTh	313HE	Miss Amidon
	Teaching	Ar	Ar	Ar	Miss Rivers
48f,w,s	Observation and Teaching: Textiles and Clothing				
	(8 cred.; sr.; prereq., H.E. 42 and 53)				
	Lect.	IX	TTh	213HE	Miss Clara Brown
	Teaching	Ar	Ar	Ar	Miss Keever, Miss Sell
49f,w,s	Observation and Teaching: General Home Economics				
	(8 cred.; sr.; prereq., H.E. 42)				
	Lect.	IX	TTh	213HE	Miss Clara Brown
	Teaching	Ar	Ar	Ar	Miss Rivers, Miss Amidon
141f	Home Economics Problems in Vocational Education	Ar	Ar	Ar	Miss Brown, Miss McNeal
	(2 cred.; sr.; prereq., H.E. Ed. 42)				
142s	Educational Measurement in Home Economics	Ar	Ar	Ar	Miss Brown
	(2 cred.; sr.; prereq., Ed. Psy. 55, H.E. Ed. 42)				

LIBRARY METHODS

No.	Title	Hour	Day	Room	Instructor
Ed7f	School Library Organization..... (2 cred.; jr., sr.)	VII (30 prac. hrs. to be ar.)	M	117Ed	Miss Penrose
Ed8w	Cataloging	VII (30 prac. hrs. to be ar.)	M	117Ed	Miss Penrose
Ed9s	Reference Work	VII (30 prac. hrs. to be ar.)	M	117Ed	Miss Penrose
Ed10f	Book Selection	VII (1 cred.; jr., sr.)	W	117Ed	Miss Penrose
Ed11w	Book Selection	VII (1 cred.; jr., sr.)	W	117Ed	Miss Penrose
Ed12s	Book Selection	VII (1 cred.; jr., sr.)	W	117Ed	Miss Penrose

PHYSICAL EDUCATION FOR MEN

Major Advisers: L. J. Keller, Fred Luchring

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s	Freshman Physical Education..... (No cred.; fr.; no prereq.)				
	Sec. 1	II	TTh	A	Mr. Taylor and others
	2	III	TTh	A	
	3	VI	TTh	A	
	4	VII	TTh	A	
	5	VIII	TTh	A	
4f	Freshman Hygiene				
	(No cred.; fr.; A-H inclusive; no prereq.)				
	Sec. 1	II	T	301F	Dr. Cooke and others
	2	III	W	301F	
	3	IV	S	301F	
	4	IV	T	301F	
4v	Freshman Hygiene				
	(See 4f; fr.; I-R inclusive)				
	Sec. 1	II	T	301F	Dr. Cooke and others
	2	III	W	301F	
	3	IV	S	301F	
	4	IV	T	301F	
4s	Freshman Hygiene				
	(See 4f; fr.; S-Z inclusive)				
	Sec. 1	II	T	301F	Dr. Cooke and others
	2	IV	T	301F	
	3	II	S	301F	
7f-8w-9s	Advanced Leaders				
	(3 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Sec. 1	IV	T	A	Mr. Taylor
		II	TTh		
	2	IV	T	A	
		III	TTh		
		IV	T	A	
		VI	TTh		
	4	IV	T	A	
		VII	TTh		
	5	IV	T	A	
		VIII	TTh		
	6	II	MWF	A	
	7	III	MWF	A	
		IV	MWF	A	

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
10f-11w-12s	Minor Sports (6 cred.; soph., jr., sr.; prereq., 1-2-3)				
	Lect.	IV	S	A	Mr. Keller
	Lab.	IV	MWF		
13f-14w-15s	Corrective Work (No cred.; by petition only; no prereq.)				
	Sec. 1	II	TTh	A	Mr. Iverson
	2	II	TTh		
	3	IV	TS		
16f-17w-18s	Drill Substitution (No cred.; by petition only; no prereq.)				
	Sec. 1	II	MWF	A	Mr. Iverson
	2	III	MWF		
	3	IV	MWF		
19f-20w-21s	Gymnastics (3 cred.; jr., sr.; prereq., 1-2-3)	III	MWF	A	Mr. Keller, Mr. Taylor
22f-23w	Kinesiology (4 cred.; jr., sr., prereq., 1-2-3, Anat. 4)	VII	TTh	A	Mr. Keller
24s	Technique of Gymnastic Teaching.. (2 cred.; jr., sr.; prereq., 22-23, Anat. 4)	VII	TTh	A	Mr. Keller
28f	Physical Examination and Normal Diagnosis (2 cred.; sr.; prereq., Physiol. 57-58)	I	MWF	A	Dr. Cooke
29w	Orthopedic and Remedial Gymnas- tics (2 cred.; sr.; prereq., 22-23-24, 29)	I	MWF	A	Dr. Cooke
30s	Athletic Training (2 cred.; sr.; prereq., none)	I	MWF	A	Dr. Cooke
31f	History of Physical Education.... (2 cred.; sr.; prereq., Ed. 1)	II	MWF	A	Mr. Keller
32w	Principles of Physical Education... (3 cred.; sr.; prereq., 31, 10-11-12, 23-24)	II	MWF	A	Mr. Keller
33s	Organization and Administration of Physical Education (3 cred.; sr.; prereq., 32)	II	MWF	A	Mr. Luehring
35w	Athletic Organization and Admin- istration (3 cred.; jr., sr.; no prereq.)	III	TTh	A	Mr. Luehring
37f	Football Coaching (3 cred.; sr.; no prereq.)				
	Lect.	VI	MWF	A	
	Lab.	Ar	Ar		
38w	Basket-Ball (2 cred.; sr.; no prereq.)	VI	MWF	A	
39s	Track Athletics (2 cred.; sr.; no prereq.)	VI	MWF	A	
42s	Baseball (2 cred.; sr.; no prereq.)	VII	MWF	A	
43f-44w-45s	Practice Teaching (6 cred.; sr.; prereq., 10-11-12, 22-23-24, Ed. 55)	Ar	Ar	A	Mr. Keller

PHYSICAL EDUCATION FOR WOMEN

Major Adviser: J. Anna Norris

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s*	Elem. Physical Training..... (No cred.; required of all students; no prereq.)				
	Sec. 1	II	MWF	3, 151, 153WGm	Ar
	2	IV	MWF	3, 151, 153WGm	Ar
	3	VI	MWF	3, 151, 153WGm	Ar
	4	VIII	MWF	3, 151, 153WGm	Ar
	5	III	TThS	3, 151, 153WGm	Ar
4f	Preliminary Hygiene (No cred.; required of all students; no prereq.)				
	Sec. 1	I	M	201WGm	Dr. Norris
	2	II	T	201WGm	
	3	III	W	201WGm	
	4	IV	M	201WGm	
	5	VI	T	201WGm	
4w	Preliminary Hygiene III		W	201WGm	Dr. Norris
7f-8w-9s	Sophomore Physical Training..... IV		TS	153WGm	Miss Hazelton
10f-11w-12s*	Sophomore Orthopedic Gymnastics.. IV (No cred.; soph.; prereq., 1-2-3)		TS	3WGm	Dr. Tolg
10f-11w	Sophomore Orthopedic Gymnastics.. (See 10-11-12)				
	Sec. 1	VI	TTh	3WGm	Miss Denny
	2	III	MF	3WGm	Miss Denny
13f-14w-15s	Sophomore Interpretative Dancing.. IX (No cred.; soph.; prereq., 1-2-3)		TTh	151WGm	Miss Baker
13f	Sophomore Interpretative Dancing.. (See 13-14-15)				
	Sec. 1	VIII (3:30)	TTh	151WGm	Miss Baker
	2	VIII (4:00)	TTh	151WGm	
13s	Sophomore Interpretative Dancing.. VIII (See 13-14-15)		TTh	151WGm	Miss Baker
14w	Sophomore Interpretative Dancing.. VIII (See 13-14-15)		TTh	151WGm	Miss Baker
16f-17w-18s*	Sophomore Games and Folk Dancing (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	III (10:30)	MF	151WGm	Miss Hazelton
	2	III (11:00)	WF	151WGm	Ar
19f-20w-21s*	Sophomore Major Sports..... (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1 (Hockey, f; basket- ball, w; baseball, s)	VI	TTh	151WGm	Miss Clayton
	2 (Tennis, f-s; basket- ball, w)	VII	TTh	151WGm	Miss Clayton
20w	Sophomore Major Sports (Basket- ball) VI (1:00) (See 19-20-21)		TTh	151WGm	Ar

* The third quarter is open to students who have not taken the preceding quarters.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
22f,s-23w§	Sophomore Elem. Swimming..... (No cred.; soph.; prereq., 1-2-3)				
	Sec. 1	IV (11:30)	MW	51WGM	Ar
	2	IV (12:00)	MW	51WGM	Ar
	3 (fall and spring only)	VII	MW	51WGM	Ar
	4	II	TTh	51WGM	Ar
	5	IV	TS	51WGM	Ar
	6	VII	TTh	51WGM	Ar
	7	VIII (3:30)	TTh	51WGM	Ar
	8	VIII (4:00)	TTh	51WGM	Ar
	9	III	MW	51WGM	Ar
25f,s-26w§	Sophomore Intermediate Swimming (No cred.; soph.; prereq., 1-2-3, elementary swimming test)				
	Sec. 1	VII (4:00)	MW	51WGM	Ar
	2	III	ThS	51WGM	Ar
28f,s-29w§	Sophomore Advanced Swimming... (No cred.; soph., jr., sr.; prereq., 1-2-3, intermediate swimming test)	VIII (3:30)	MW	51WGM	Ar
30w	Sophomore Figure Skating..... (No cred.; soph., jr., sr.; prereq., 1-2-3 and ability to skate)	VIII	TTh	WGm rink or 3WGm	Mr. Iverson
36w	Winter Sports (No cred.; fr. majors in Phys. Ed., 1-2-3 and ability to skate)	VII (3:00)	TTh	WGm rink or 3WGm	Mr. Iverson
37f-38w	Freshman Major Sports..... (No cred.; fr. majors in Phys. Ed.)	I	TTh	151WGM	Miss Kissock, Miss Hazelton
43f-44w-45s	Play and the Playground..... (3 cred.; jr., sr.; prereq., 6 quarters)	VI (fall & w) VII (fall & w)	TTh T	151WGM 201WGM	Miss Kissock
50w	Gymnastics for Freshmen..... (No cred.; fr. majors in Phys. Ed.; no prereq.)	VI ½ (w)	MWF	153WGM	Miss Clayton
51f-52w	Gymnastics for Sophomores..... (1 cred.; soph. majoring or jrs. minoring; prereq., 1-2-3)	II	TTh	153WGM	
54f-55w	Gymnastics for Juniors..... (1 cred.; jrs. majoring and srs. minoring; prereq., 51-52)	I (fall) II (winter)	TTh T	153WGM	
56w-57s	Swimming with Technique..... (1 cred.; soph., jr.; prereq., Phys. Ed. 28)	VII (winter) III (spring)	MW TF	51WGM 51WGM	
58w-59s	Advanced Folk Dancing with Technique (2 cred.; jr.; prereq., 6 qtrs.)	I	MWF	151WGM	Miss Baker
60f	Minor Sports with Technique..... (1 cred.; jr.; prereq., 6 qtrs.)	II VII	TTh Th	153WGM	Miss Kissock, Miss Hazelton
61s	Minor Sports with Technique..... (See 60f)	II	TTh	153WGM	Miss Hazelton, Miss Clayton
63f-64w-65s	Major Sports with Technique..... (3 cred.; soph., jr.; prereq., 37)	I (f, w) VIII I (s) VII (s)	ThF T TThF T	151WGM	Miss Kissock
66f-67w-68s	Interpretive Dancing (3 cred.; jr.; prereq., 6 qtrs.)	III	MWF	151WGM	Miss Baker

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
69f-70w-71s	Advanced Interpretive Dancing with Technique (2 cred.; sr.; prereq., 66-67-68)	Lect. IV (f, w, s) Lab. IV	MW	151WGm	Miss Baker
75w	History of Physical Education.... (2 cred.; jr., sr.; prereq., Ed. 1)	IV	TS	201WGm	Miss Hazelton
76w	Physical Diagnosis and Prophylaxis (2 cred.; sr.; prereq., Physiol. 57-58)	I, II	W		Dr. Barron
80f-81w	Kinesiology (8 cred.; jr., prereq., Anat. 3, Farm En. 23)	VIII III	Th TThS	201WGm	Miss Denny
82s	Physical Examination (2 cred.; jr.; prereq., 80-81)	VIII	MTh	201WGm	Dr. Tolg
83s	Technique of Gymnastic Teaching.. (3 cred.; jr.; prereq., 54-55, 80-81)	III III	TThS MTh	Ar 201WGm	Miss Baker
84f	Principles of Gymnastics..... (3 cred.; sr.; prereq., 54-55, 82)	Lect. I Lab. II	W MF	201WGm 201WGm	Miss Hazelton Miss Baker
85w-86s	Principles of Physical Education... (2 cred. w.; 1 cred. s.; prereq., 84, 91)	III (w) IV (s)	ThS W	201WGm	Miss Baker
87s	Personal and School Hygiene..... (3 cred.; sr.; prereq., Physiol. 57-58)	II	MWF	201WGm	
88f-89w-90s	Orthopedic and Remedial Gym..... (3 cred.; sr.; prereq., 83)	VII (fall) VIII (fall & w) Lab. hr.	TTh Th Ar	3WGm 3WGm	Dr. Tolg Dr. Tolg
	Spring Lect.	VII Prac. teach.	Th Ar	3WGm	Dr. Tolg
91f	Principles of Dancing..... (2 cred.; sr.; prereq., 66-67-68)	VII	MW	151WGm	Miss Baker
92f-93w-94s	Practice Teaching (6 cred.; sr.; prereq., 43-44-45, 56-57, 63-64-65, 69, 91, 83)	Ar	Ar	Ar	Miss Baker and others
97w	Organization and Administration... (3 cred.; sr.; prereq., 85)	IV VI	WF Th	201WGm	Dr. Norris

Courses for Which No Registration Is Required

31f,w,s	Life-Saving	IX	W	51WGm	
32f,w,s	General Swimming	IX	MTF	51WGm	
	(No cred.; all; no prereq.)				
33-34-35*	Hockey, Basket-Ball, and Baseball (No. cred.; fr., jr., sr.; prereq., permission of director)	IX	MTWTh	151WGm	Miss Kisssock

PUBLIC SCHOOL MUSIC

Major Advisers: Carlyle M. Scott, Abe Pepinsky

No.	Title	Hour	Day	Room	Instructor
29-30-31	Grade School Methods..... (9 cred.; jr., sr.; no prereq.)	IX, X	F	117Ed	Mr. Giddings
32-33-34	High School Methods..... (9 cred.; jr., sr.; prereq., 29-30-31)	IX, X	W	117Ed	Mr. Giddings

* The third quarter is open to students who have not taken the preceding quarters.

No.	Title	Hour	Day	Room	Instructor
51f-52w-53s	Instrumentation (3 cred.; jr., sr.; prereq., 1, 2, and 3 or equiv.)	VII	Th	3Mu	Mr. Pepinsky
54f-55w-56s	Advanced Instrumentation (3 cred.; jr., sr.)	VIII	T	3Mu	Mr. Pepinsky
64f-65w-66s	Orchestra-Conducting (6 cred.; jr., sr.)	VII VIII (Observation 7:30 p.m.)	M Th W	4Mu	Mr. Pepinsky
71-72-73	Class Instrument Teaching..... (3 cred.; soph.; no prereq.)	I	T	3Mu	Mr. Pepinsky
74-75-76	Advanced Class Instrument Teaching (3 cred.; jr.; prereq., 71-72-73)	VII, VIII	MTh	4Mu	Mr. Pepinsky
81f-82w-83s	Observation of Teaching..... (6 cred.; jr., sr.; prereq., 32-33-34)	<i>Not offered in 1925-26.</i>			

THEORY AND PRACTICE OF TEACHING

Major Advisers: Leo J. Brueckner, Earl Hudelson

GENERAL METHODS

No.	Title	Hour	Day	Room	Instructor
15f,w,s	Technique of High School Instruction (3 cred. jr., sr.; prereq., Ed. 55)	III	MWF	204Ed	Mr. Hudelson
16f,w,s	Practice Teaching (5 cred.; sr., grad.; prereq., Ed. 15 and Special Methods Course)	Ar	Ar	Ar	Mr. Boardman
17s	Practice Teaching of Subnormal Children (2 cred.; jr., sr.)	Ar	Ar	Ar	Mr. Boardman

SPECIAL METHODS

18s	Teachers' Course in Animal Biology (3 cred.; jr., sr., grad.; prereq., An. Biol. 1-2, Ed. 15)	V, VI, VII	TTh	213AB	Mr. Sigerfoos
19f,s	Teachers' Course in Botany..... (5 cred.; jr., sr.; prereq., 18 cred. in botany and Ed. 15)	VII	MTWThF	210P	
20s	Teachers' Course in Chemistry..... (3 cred.; jr., sr.; prereq., gen. chem. and qual. chem. and Ed. 15)	III	MWF	315C	Mr. Geiger
23f	Teachers' Course in Geography.... (3 cred.; jr., sr.; prereq., Geog. 114 and Ed. 15)	I	MWF	Ar	
35s	Teachers' Course in Norwegian.... (3 cred.; sr., grad.; prereq., Scand. 4-5, or 10-11-12 and Ed. 15)	Ar	Ar	206F	Mr. Bothne
39f	<i>Social Science for Junior High Schools</i> (2 cred.; jr., sr.)	<i>Not offered in 1925-26.</i>			
41w	Teachers' Course in Swedish..... (3 cred.; sr., grad.; prereq., Scand. 10-11-12 or 4-5 and Ed. 15)	Ar	Ar	206F	Mr. Stomberg

PROGRAM

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No.	Title	Hour	Day	Room	Instructor
42w	<i>Fundamental Educational Theories Relating to Instruction in the Elementary School</i>				
	(2 cred.; jr., sr.)				<i>Not offered in 1925-26.</i>
43f	<i>The Teaching of English in the Elementary School</i>				
	(2 cred.; jr., sr.; prereq., Ed. 37f)				<i>Not offered in 1925-26.</i>
44w	<i>Children's Literature</i>				
	(2 cred.; jr., sr.; prereq., Ed. 37f)				<i>Not offered in 1925-26.</i>
45s	<i>Teaching of Geography and History in the Elementary School</i>				
	(2 cred.; jr., sr.; prereq., Ed. 37f)				<i>Not offered in 1925-26.</i>
46f,w,s	Practice Teaching with Special Methods	Ar		Ar Ar	Mr. Peik
	(5 cred.; jr., sr.)				
47f	<i>Field Problems in High School Training Departments</i>				
	(2 cred.; jr., sr.)				<i>Not offered in 1925-26.</i>
48f	Teachers' and Supervisors' Course in Arith. for Lower Grades.....	I, II		S Ar	Mr. Brown
	(2 cred.; jr., sr., grad.; prereq., 15 cred. in education)				
49w	Teachers' and Supervisors' Course in Arith. for Intermed. and Upper Grades	I, II		S Ar	Mr. Brown
	(2 cred.; jr., sr., grad.; prereq., 15 cred. in education)				
50f,w	Normal School Teaching and Administration	III, IV		S Ar	Mr. Brown
	(4 cred.; jr., sr., grad.; prereq., 15 cred. in education)				
51f	The Teaching of English in the Junior High School.....	I, II		S 206Ed	Miss Smith
	(2 cred.; jr., sr.)				
52f-53w-54s†	Teachers' Course in English and Practice Teaching	VII		TTh 205Ed	Miss Inglis
	(9 cred.; jr., sr., prereq., Ed. 15)				
56f-57w-58s†	Teachers' Course and Practice Teaching in Mathematics.....	VIII		MW 113Ed	Mr. Haertter
	(9 cred.; jr., sr.; prereq., Math. 50 and Ed. 15)				
59f-60w-61s†	Teachers' Course and Practice Teaching in Physics.....	IX		TTh 8Ed	
	(9 cred.; jr., sr.; prereq., see announcement, Ed. 15)				
62f-63w-64s†	Teachers' Course and Practice Teaching in Secondary School Science	IX		MW 8Ed	Mr. Smith
	(9 cred.; jr., sr.; prereq., Ed. 15 and consent of instructor)				

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
66f-67w-68s†	Teachers' Course and Practice Teaching in Social Science for Senior High Schools..... (9 cred.; jr., sr.; prereq., 30 cred. in history or social science. Consult instructor)	VII	TTh	Ar	Mr. Krey, Mr. Tohill
70f-71w-72s†	Teachers' Course and Practice Teaching in German..... (9 cred.; jr., sr.; prereq., 52, 55, and Ed. 15)	VII	MW	215Ed	Miss Hubman
73f-74w-75s†	Teachers' Course and Practice Teaching in Latin..... (9 cred.; jr., sr.; prereq., any two of Courses 51-53 or equiv., 75, and Ed. 15)	VII	TTh	112Ed	Miss Denneen
76f-77w-78s†	Teachers' Course and Practice Teaching in the Romance Languages (9 cred.; jr., sr.; prereq., 13, 14, 15, and one conv. comp. course. one literary course, and Ed. 15)	VII	MTh	111Ed	Miss Violet
80f-81w-82s†	Teachers' Course and Practice Teaching in Commercial Subjects (8 cred.; jr., sr.; prereq., Ed. 15 and consent of instructor)	Ar		Ar Ar	Miss Davidson

COURSES OPEN TO GRADUATE STUDENTS

193s	Foundations of Secondary School Methods	VIII		MWF Ar	Mr. Hudelson
	(3 cred.; sr., grad.; prereq., Ed. 15)				
195w	Problems of High School English Teaching	III, IV		S 112Ed	Mr. Hudelson
	(2 cred.; sr., grad.; prereq., Ed. 15 and 21)				
222f-223w-224s	Research Problems in Secondary School Methods	Ar		Ar Ar	Mr. Hudelson
	(2 cred.; grad.; prereq., Ed. 15 and 113)				
225f-226w-227s	Seminar in Elementary School Problems	IX, X		T	Mr. Brueckner

TRADE AND INDUSTRIAL EDUCATION

Major Adviser: Homer J. Smith

No.	Title	Hour	Day	Room	Instructor
Ind. 10w	Methods, Elementary Grade Woodwork	VII, VIII	TTh	24Ed	Mr. Stockwell
	(2 cred.; all; no prereq.)				
Ind. 11w	Special Class Woodwork.....	IX, X	TTh	24Ed	Mr. Stockwell
	(2 cred.; all; no prereq.)				
Ind. 12s	Methods, Elementary Electric Wiring				<i>Not offered in 1925-26.</i>
	(2 cred.; all; no prereq.)				
Ind. 14s	Methods of Teaching Drawing.....	IX, X		T 206OL	Mr. Stockwell
	(2 cred.; all; prereq., 10 cred. in draw. or by permission)				

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
Ind. 20s	Industrial History (2 cred.; all; no prereq.)	IX, X	W	206OL	Mr. Tohill
Ind. 25s	Literature of Industrial Education (2 cred.; all; no prereq.)	IX, X	Th	208OL	Mr. Smith
Ind. 30f	Graphic Presentation (2 cred.; all; no prereq.)	III, IV	S	206OL	Mr. Smith
Ind. 40f	Analysis (2 cred.; all; no prereq.)	IX, X	T	206OL	Mr. Stockwell
Ind. 42w	Selection and Organization of Related Materials (2 cred.; all; no prereq.)	IX, X	T	206OL	Mr. Smith
Ind. 50f, 51w, 52s	Practice Teaching (6 cred.; jr., sr.; prereq., Ed. 15, Ind. 80, and any one of Ind. 65, 66, 70)	Ar	Ar	Ar	Mr. Smith
Ind 60f	Social Agencies in Education..... (2 cred.; jr., sr.; no prereq.)	IX, X	M	210OL	Mr. Prosser
Ind. 61w	Social Significance of Vocational Education (2 cred.; jr., sr.; prereq., Ind. 60)	IX, X	M	210OL	Mr. Prosser
Ind. 65f	Methods in Non-vocational Subjects (2 cred.; all; no prereq.)	IX, X	W	206OL	Mr. Smith
Ind. 66s	Methods in Related Subjects..... (2 cred.; jr., sr.; prereq., Ind. 40 and 42)	IX, X	F	206OL	Mr. Smith
Ind. 70w	Methods in Shop Subjects..... (2 cred.; jr., sr.; prereq., Ind. 40)	IX, X	F	206OL	Mr. Smith
Ind. 80f	Organization and Supervision of General Industrial Training..... (2 cred.; all; no prereq.)	IX, X	F	206OL	Mr. Smith
Ind. 110w	Guidance in the Schools..... (2 cred.; jr., sr., grad.; prereq., Ed. Psy. 134)	III, IV	S	210OL	Mr. Smith
Ind. 150f- 151w-152s	Seminar in Vocational Education.. (6 cred.; grad. only)	7:30-9:30 p.m.	M	Ar	Mr. Prosser
Ind. 171f	Administration of Vocational Education (day schools)..... (2 cred.; jr., sr., grad.; no prereq.)	IX, X	Th	210OL	Mr. Craigo
Ind. 172w	Administration of Vocational Education (evening schools)..... (2 cred.; jr., sr., grad.; prereq., 171)	IX, X	W	210OL	Mr. Bass
Ind. 173s	Administration of Vocational Education (part-time classes)..... (2 cred.; jr., sr., grad.; prereq., 171 and 172)	IX, X	M	210OL	Mr. Prosser

Shopwork and drawing courses of wide variety are available in the College of Engineering. Students may also elect to pursue courses, day or evening, at Dunwoody Industrial Institute. Conference with the adviser and consequent assignment to Dunwoody assures that the enrolment fee paid to the University covers the cost of instruction.

COLLEGE OF EDUCATION

ANIMAL BIOLOGY

REQUIREMENTS OF THE DEPARTMENT

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

For teacher's certificate.—Major recommendation: General Zoology, and at least 20 additional credits in the department. Medical Physiology (Course 4) is included among the electives.

Minor recommendation: General Zoology, and at least ten additional credits chosen from the following: General Physiology, Histology, Entomology, General Embryology, Ornithology, and Human Physiology (Medical Physiology, Course 4).

No.	Title	Hour	Day	Room	Instructor
1f-2w†	General Zoology				Mr. Minnich
	(10 cred.; all; no prereq.)				
	Sec. 1 Lab.	III, IV	MWF	101AB	
	(Limit, 150) Lect.	III	TThS		
		IV	T	313AB	
	Sec. 2 Lab.	VI, VII	MWF	101AB	
	(Limit, 150) Lect.	VI, VII	TTh	313AB	
1w-2s†	General Zoology				Mr. Sigerfoos
	(See 1f-2w)				
	Sec. 1 Lab.	I, II	MWF	101AB	
	Lect.	I	T		
		II	TThS	313AB	
1s-(2su† or 2w†)	General Zoology				
	(See 1f-2w)				
	Lab.	VI, VII, VIII	WF	101AB	Ar
	Lect.	VI, VII	MTh	313AB	
5f-6w-7s†	General Zoology				
	(12 cred.; pre-medical and pre-dental students; no prereq.)				
	Sec. 1 Lab.	I, II	TS	101AB	Mr. Ringoen
	(Pre-dental) Lect.	I	MWF	313AB	
	Sec. 2 Lab.	III, IV	TS	101AB	Mr. Sigerfoos
	(Pre-medical) Lect.	IV	MWF	313AB	
	(Spring) Lab.	III, IV	WF	101AB	
	Lect.	IV	MTS	313AB	
14f-15w-16s†	General Zoology	See College of Agriculture bulletin.			
	(9 cred.; Agr., For., H.E.; no prereq.)				
21s	Introd. to General Physiology...	VI, VII, VIII	MW	10AB	Mr. Lund
	(5 cred.; fr., soph., jr., sr.; prereq., 1-2, chem. or phys. desirable)	VI, VII, VIII, IX	F		
22s	General Ecology	VI, VII, VIII	MW	401AB	Mr. Chapman
	(5 cred.; fr., soph., jr., sr.; prereq., 1-2)	VI, VII, VIII, IX	F		
23f	Introd. Entomology	VI, VII	MTWThF	204,	
	(5 cred.; soph., jr., sr.; prereq., 1-2)			211AB	Mr. Oestlund
24f	Introd. Animal Parasitology.....	VI, VII, VIII	MWF	202AB	Mr. Riley
	(5 cred.; soph., jr., sr.; prereq., 1-2)				

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
26w	Comp. Anatomy (5 cred.; soph., jr., sr.; prereq., 1-2)	III, IV	MTWFS	202, 211AB	Ar
27w	Cytology and Technique..... (5 cred.; soph., jr., sr.; prereq., 1-2)	VI, VII	MTWThF	201AB	Ar
29w-30s†	Histology and Organology..... (10 cred.; soph., jr., sr.; prereq., 1-2 and permission of the head of the department)	I, II	MTWThF	201AB	Miss Payne
31f	General Physiology (5 cred.; soph., jr., sr.; prereq., 15 cred. in an. biol. or 10 cred. in an. biol. and 10 cred. in chem. or phys.)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
32w	General Physiology (5 cred.; soph., jr., sr.; prereq., as for 31)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
33s	Principles of Animal Behavior... (5 cred.; soph., jr., sr.; prereq., 15 cred. in an. biol. or 10 cred. in chem. or phys. or psy.)	VI, VII, VIII VI, VII, VIII, IX	MW F	10AB	Mr. Lund
37f-38w-39s†	General Entomology (9 cred.; soph., jr., sr.; prereq., 1-2)	I, II	MWF	204AB	Mr. Oestlund
44s	Animal Parasites (3 cred.; fr. soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	WF	202AB	Mr. Riley
45w	Insects and Disease..... (3 cred.; fr. soph., jr., sr.; prereq., 1-2)	VI, VII, VIII	WF	202AB	Mr. Riley
46w-47s†	Ornithology (6 cred.; soph., jr., sr.; prereq., 1-2 and permission of instructor)	VI, VII, VIII	MW	314AB	Dr. Roberts
48f-49w-50s†	Histology and Organology (9 cred.; soph., jr., sr.; prereq., 1-2 and permission of the head of the department)	III, IV	MWF	201, 211AB	Mr. Downey
75s	Nature Study (3 cred.; jr., sr.; prereq., 20 cred. incl. 1-2)	VI, VII, VII	TTh	213AB	Mr. Sigerfoos
107s	Protozoology (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	I, II	MWF	211, 213AB	Mr. Sigerfoos
108s	Experimental Zoology (5 cred.; jr., sr., grad.; prereq., 15 cred. in an. biol. or An. Biol. 1-2 and Psy. 1-2)	VII and other hours to be arranged	MWF	10AB	Mr. Minnich
109f-110w-111s	General Physiology (15 cred.; jr., sr., grad.; prereq., 20 cred. in an. biol.)	Ar	Ar	Ar	Mr. Lund
117f-118w-119s	Ecology of Insects..... (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1-2)	VI, VII, VIII	TTh	401AB	Mr. Chapman

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
120su	Advanced Ecology (5 cred.; jr., sr., grad.; prereq., 117-118-119)	Ar		Ar Ar	Ar
125f-126w-127s†	Advanced Entomology (9 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	Ar		Ar 204AB	Mr. Oestlund
130w	Biology of Aphididae..... (3 cred.; jr., sr., grad.; prereq., 20 cred. incl. 1-2)	III, IV		MWF 204AB	Mr. Oestlund
139f-140w†	Histol. and Develop. of Insects.. (6 cred.; jr., sr., grad.; prereq., 1-2 and 37-38-39)	II, III, and ar		TTh 324Ad(F)	Mr. Riley
144f-145w-146s	Animal Parasites and Parasitism (9 cred.; jr., sr., grad.; prereq., 1-2 and 5 add. cred.)	VI, VII, VIII		WF 202AB	Mr. Riley
154w-155s†	Hematology (6 cred.; jr., sr., grad.; prereq., histol., embryol.)	VI, VII, VIII		TTh 201, 211AB	Mr. Downey
181f-182w†	Embryology (6 cred.; jr., sr., grad.; prereq., 1-2 and 27 or equiv.)	VI, VII		MWF 201, 211AB	Ar
183s	Genetics and Eugenics..... (3 cred.; jr., sr., grad.; prereq., 1-2 and 5 other cred. in an. biol. or botany)	IV		MWF 211AB	Ar
187w	Seminar* (Phil. Aspects of Zoology) (1 cred.; sr., grad.; prereq., permission of instructor)	Ar		Ar Ar	Mr. Minnich
197f-198w-199s	Problems (9 or 18 cred.; sr., grad.; prereq., 1-2 and special requirements)	Ar		Ar Ar	Ar

ENTOMOLOGY AND ECONOMIC ZOOLOGY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE.—Consult the bulletin of the College of Agriculture, Forestry, and Home Economics for program of hours, days, buildings, and instructors.

No.	Title	Hour	Day	Room	Instructor
3f,w	Economic Entomology (3 cred.; soph., jr., sr.; prereq., an. biol. 9 cred.)				
4f	Economic Vertebrate Zoology..... (3 cred.; jr., sr.; prereq., an. biol. 9 cred.)				
8f	Variety and Habits of Fur-Bearing Animals (3 cred.; soph., jr., sr.; prereq., an. biol. 9 cred.)				
150f,su	Insecticides and Their Action..... (3 or 6 cred.; jr., sr.; prereq., 37-38-39, Agr. Biochem. 7-8, or equiv.)				
197f,w,s,su	Introduction to Research..... (5 or more cred.; sr.; prereq., 37-38-39 or 44-45 and other work as prescribed by the division)				

*This course is primarily for students whose major subject is animal biology or psychology.

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

ANTHROPOLOGY

Major Advisers: A. J. Jenks, W. D. Wallis

MAJOR SEQUENCE

At least 24 credits selected from the following courses: 80, 108, 110, 112, 113, 121, 161; Educational Psychology 111; History 121-122, 166. In addition, Psychology 125-126 is required. (Prerequisites: 15 credits from the biological sciences, 15 credits from the social sciences; Anthropology 51 (or 1) and two other courses.)

Modifications of this sequence will be permitted upon petition approved by the major adviser and the assistant dean for the Senior College.

No.	Title	Hour	Day	Bldg.	Instructor
51f,w,s	Introd. to Anthropology..... (5 cred.; jr., sr.; prereq., 10 cred. of a science and 10 cred. of a social science)	VI	MTWThF	15F	Mr. Jenks and Mr. Wallis
53w	Cultural Anthropology: Technology (3 cred.; jr., sr.; prereq., 51)	II	TThS	15F	Mr. Wallis
54s	Cultural Anthropology: Social Organization..... (3 cred.; jr., sr.; prereq., 51)	II	TThS	15F	Mr. Wallis
55w	Human Migrations with Special Reference to Immigration..... (3 cred.; jr., sr.; prereq., 51)	II	MWF	15F	Mr. Jenks
62f	Ethnology..... (3 cred.; jr., sr.; prereq., 51)	IV	MWF	15F	Mr. Jenks
80f	The American Indian..... (3 cred.; jr., sr.; prereq., 51)	II	MWF	12F	Ar
108f	Philippine Peoples..... (3 cred.; jr., sr.; prereq., 51)	III	MWF	15F	Mr. Jenks
110f	Physical Anthropology..... (3 cred.; jr., sr.; prereq., 51)	II	TThS	12F	Mr. Wallis
112s	The American Negro..... (3 cred.; jr., sr.; prereq., 51)	III	MWF	15F	Mr. Jenks
113s	Peoples of Europe..... (3 cred.; jr., sr.; prereq., 55)	II	MWF	15F	Mr. Jenks
121w	Advanced Phys. Anthropol..... (3 cred.; jr., sr., prereq., 110)	Ar	Ar	12F	Mr. Wallis
123w-124s	Problems in Anthropology..... (6 cred.; jr., sr., grad.; prereq., three courses)	Ar	Ar	12F	Mr. Jenks
161s	Primitive Religion..... (3 cred.; jr., sr.; prereq., 51)	II	MWF	12F	Mr. Wallis

ARCHITECTURE

COLLEGE OF ENGINEERING AND ARCHITECTURE

Major Adviser: Frederick M. Mann

Junior College Courses

No.	Title	Hour	Day	Room	Instructor
21f-22w†-23s	Free-Hand Drawing..... (6 cred.; soph., jr., sr.; prereq., soph. standing)				
31f-32w†-33s	Elements of Architecture..... (15 cred.; soph., jr.; prereq., soph. standing)				
31w-32s†-33su	Elements of Architecture..... (See 31f-32w-33s)				
61f-62w-63s	Projections, Shades, and Shadows, Perspective..... (6 cred.; soph.; prereq., Math 5)				

Note.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors.

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

Senior College Courses

14f-15w-16s	History of Architecture..... (6 cred.; jr., sr.; prereq., 31-32-33)
17f-18w-19s	History of Architecture..... (6 cred.; jr., sr.; prereq., 14-15-16)
34-35-36f,w,s	Architectural Design (12 cred.; jr., sr.; prereq., 31-32-33, 23, 61-62-63)
51f-52w-53s	Building Construction (6 cred.; jr., sr.; prereq., 31-32-33)
74f-75w-76s	Free-Hand Drawing (9 cred.; jr., sr., int. dec.; prereq., 23)
81f	Color and Design..... (2 cred.; stud. of dram.; to accompany Pub. Speak. 91-92-93)
134-135-136f,w,s	Interior Decoration Design..... (21 cred.; sr.; prereq., 34-35-36)
163s	History of Sculpture and Painting (2 cred.; jr., sr.; prereq., 14-15-16)
182f-183w	Decoration and Allied Arts..... (6 cred.; sr.; prereq., 17-18-19)

Note.—Consult the bulletin of the College of Engineering and Architecture for program of hours, days, buildings, and instructors.

ASTRONOMY

Major Adviser: Francis P. Leavenworth

No.	Title	Hour	Day	Room	Instructor	
111f§*	Descriptive Astronomy (5 cred.; 3d qtr., fr., soph., jr., sr.; no prereq.)	III	MTThFS	124F	Mr. Beal	
111w§*	Descriptive Astronomy (See 111f)	Sec. 1 2	III IV	MTThFS MTWFS	124F 124F	Mr. Beal Mr. Leavenworth
111s§*	Descriptive Astronomy (See 111f)	Sec. 1 2	I III	TWThFS MTThFS	124F 124F	Mr. Beal Mr. Leavenworth
25w§*	Stellar Astronomy (3 cred.; soph., jr., sr.; prereq., 11)	II	TThS	124F	Mr. Beal	
25s§*	Stellar Astronomy (See 25w)	IV	MWF	124F	Mr. Leavenworth	
51f-52w-53s‡	General Astronomy (10 cred.; jr., sr.; prereq., Math. 5, 6, and 7, or phys. sci. and Math. 6)	II	MWF (fall, winter) MWF and ar (spring)	124F	Mr. Leavenworth	

* Courses 11-25 and 51-52-53 cover much the same field. Students are advised not to take both 51-52-53 and 11-25.

‡ Satisfies the junior college requirement for science. Open without petition to sophomores who have the prerequisites and who satisfy the requirements in General Information, section 43 of Science, Literature, and the Arts bulletin, Part I.

§ Does not satisfy the junior college requirement for science.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
62f	Elements of Practical Astron. (3 cred.; jr., sr.; prereq., Astron. 11 or 51, and Math. 6, 7)	III	MWF	123F	Mr. Leaven- worth
101f-102w-103s	Practical Astronomy (9 or 18 cred.; jr., sr., grad.; prereq., Astron. 11 or 51, and Math. 50)	Ar	Ar	123F	Mr. Leaven- worth
111f-112w-113s	Celestial Mechanics (9 cred.; sr., grad.; prereq., Math. 51)	Ar	Ar	123F	Mr. Beal
140w	Method of Least Squares..... (3 cred.; jr., sr., grad.; prereq., Math. 51)	II	TThS	123F	Mr. Leaven- worth

BACTERIOLOGY

MEDICAL SCHOOL

Major Advisers: Arthur T. Henrici, Winford P. Larson

No.	Title	Hour	Day	Room	Instructor
51f	General Bacteriology (5 cred.; jr., sr.; prereq., chem. 10 cred. and biol. 8 cred.)				
	Sec. 1	VI, VII, VIII	MWF	MH	Ar
	2	VI, VII, VIII, IX	TTh	MH	Ar
51w,s	General Bacteriology (See 51f)	VI, VII, VIII	MWF	MH	Ar
101f	Special Bacteriology for Medical Students (4 cred.; jr., sr.; prereq., 51)	I, II I, II, III	ThS T	MH	Ar
103s	Special Bacteriology for Students of Agriculture (5 cred.; jr., sr.; prereq., 51)	I, II, III I, II	TS Th	MH	Ar
105f	Food Bact. (3 cred.; jr., sr.; prereq., 51)	VII, VIII	TTh	MH	Ar
114s	Higher Bacteria (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
116w	Immunity (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
117s	Pathogenic Protozoa (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
118f	Morphology and Taxonomy of Bac- teria (3 cred.; jr., sr.; prereq., 101 or 103)	VII, VIII	TTh	MH	Ar
119f-120w	Bacteriological Chemistry (4 cred.; jr., sr.; prereq., 101 or 103; Physiology 100, 101, or Agr. Biochem. 111-112)	VI, VII, VIII	TTh	MH	Ar
121w	Common Fermentations	See Medical School bulletin.			
125f	Industrial Bacteriology	See Medical School bulletin.			
150f,-151w, or 150w-151s	Advanced Bacteriology (Cred. ar.; jr., sr.; prereq., see instructor)	VII, VIII	TTh	MH	Ar

BOTANY

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation, 31 credits in botany as follows: Courses 1-2, 7, 21, 22, and either 12 and 13 or 62 and 63; Course 51 advised.

Minor recommendation in botany 20 credits as follows: Courses 1-2, 7, and either 21 or 22; Course 51 advised.

No.	Title	Hour	Day	Room	Instructor
1f-2w†	General Botany				Mr. Huff
	(10 cred.; all; no prereq.)				
	Sec. 1 Lab.	I, II	MWF	212, 214, 220P	
	Quiz	I	T	212, 214, 220P	
	Lect.	II	TThS	210P	
	Sec. 2 Lab.	VI, VII	MWF	212, 214, 220P	
	Quiz	VII	Th	210P	
	Lect.	VI, VII	T	210P	
		VI	Th	210P	
1w-2s†	General Botany				Mr. Huff
	(See 1f-2w)				
	Lab.	III, IV	MWF	212, 214, 220P	
	Quiz	IV	T	212, 214, 220P	
	Lect.	III	TThS	210P	
1s-(2f)†	General Botany				Mr. Huff
	(See 1f-2w)				
	Lab.	I, II	TThS	212, 214, 220P	
	Quiz	I	W	212, 214, 220P	
	Lect.	II	MWF	210P	
(1s)-2f†	General Botany				Mr. Huff
	(See 1f-2w)				
	Lab.	I, II	TThS	212, 214, 220P	
	Quiz	I	W	212, 214, 220P	
	Lect.	II	MWF	210P	
7s	Taxonomy of Flowering Plants....				
	(5 cred.; all; prereq., 2)				
	Lab.	I, II	MWF	212, 214, 220P	Mr. Rosendahl
	Quiz	I	S	210P	
	Lect.	I	TTh	210P	
12f	Morphology of Algae.....	I, II	TThS	213AB	Miss Tilden
	(3 cred.; all; prereq., 2)				
13	Morphology of Fungi.....	<i>Not offered in 1925-26.</i>			
	(3 cred.; all; prereq., 2)				
21s	Elementary Ecology	III, IV	MTWFS	G	
	(5 cred.; all; prereq., 2)				
22f,s	Elementary Plant Physiol.....	III, IV	MTWFS	G	Mr. Harvey
	(5 cred.; all; prereq., 2)				
51f	Histological Methods	I, II	MWF	213AB	Miss Thompson
	(3 cred.; jr., sr.; prereq., 15 cred.)				
62w	Bryophytes and Pteridophytes.....	III, IV	MWF	Ar	Mr. Huff
	(3 cred.; jr., sr.; prereq., 15 cred.)				
63s	Gymnosperms and Angiosperms....	VI, VII, VIII	TTh	Ar	Mr. Butters
	(3 cred.; jr., sr., grad.; prereq., 7 or 62)				

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
101f	Elementary Biometry (3 cred.; jr., sr., grad.; prereq., 18 cred., biol. sci.)	Ar	Ar	Ar	Mr. Harris
108s	Pteridophytes (5 cred.; jr., sr., grad.; prereq., 7 or 62)	Ar	Ar	Ar	Mr. Butters
110	<i>Gymnosperms</i> (5 cred.; jr., sr., grad.; prereq., 7 and 63)	<i>Not offered in 1925-26.</i>			
113f-114w-115s	Adv. Taxonomy (9 cred.; jr., sr., grad.; prereq., 15 cred. incl. 7)	VI, VII	MWF	213AB	Mr. Rosendahl
118w	Cytology (3 cred.; jr., sr., grad.; prereq., 18 cred.)	VI, VII, VIII	TTh	213AB	Mr. Rosendahl
123w	Algae: Blue-Green (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
124f	Algae: Green (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
125w	Algae: Brown (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
126s	Algae: Red (3 cred.; jr., sr., grad.; prereq., 15 cred. incl. 12)	VI, VII, VIII	TTh	104AB	Miss Tilden
127s	Anatomy of Vascular Plants..... (5 cred.; jr., sr., grad.; prereq., 18 cred.)	Ar	Ar	213AB	Mr. Butters
131f	Field Ecology (5 cred.; jr., sr., grad.; prereq., 21)	Ar	Ar	G	Mr. Cooper
132w	Ecological Anatomy (5 cred.; jr., sr., grad.; prereq., 21)	III, IV	MTWFS	G	
133s	Forest Geography of North America (5 cred.; jr., sr., grad.; prereq., 21)	VI, VII	MWF	G	
141f	Physical Phases of Plant Physiology (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Harvey
142w	Plant Metabolism (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Harvey
143s	Plant Metabolism and Growth..... (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	I, II	MTWThF	G	Mr. Harvey
144s	Plant Microchemistry (5 cred.; sr., grad.; prereq., 22 and gen. org. chem.)	III, IV	MTWFS	G	Mr. Harvey
145f,w,s	Advanced Biometry (3 cred.; sr., grad.; prereq., 101)	Ar	Ar	Ar	Mr. Harris

COLLEGE OF EDUCATION

PLANT PATHOLOGY AND BOTANY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Room	Instructor
1f	Plant Pathology				
	(5 cred.; jr., sr.; prereq., bot. 9 cred.)				
1w	Plant Pathology				
	(See 1f)				
7w-8s	Weeds and Grasses.....				
	(6 cred.; soph., jr., sr.; prereq., bot. 9 cred.)				
9f	Weeds and Seed-Testing.....				
	(3 cred.; soph., jr., sr.; prereq., bot. 9 cred.)				
10f	Forest Pathology				
	(5 cred.; soph., jr., sr.; prereq., bot. 9 cred.)				
10s	Forest Pathology				
	(See 10f)				
12w	Seed Problems				
	(3 cred.; jr., sr.; prereq., 9)				
14s	Plant Disease Control.....				
	(5 cred.; jr., sr.; prereq., 1, Ent. 3)				

Advanced Courses

105f-106w-107s	Mycology				
	(9 cred.; jr., sr.; prereq., 1 or 10 or equiv.)				
108f	Methods				
	(3 cred.; jr., sr.; prereq., 1 or 10, Bact. 51)				
110w	Principles of Pathology				
	(3 cred.; jr., sr.; prereq., 1 or 10, Bact. 51)				
111w	Diseases of Field Crops.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
112	Diseases of Fruit Crops.....				Not offered in 1925-26.
	(3 cred.; jr., sr.; prereq., 1 or 10)				
113s	Diseases of Vegetable Crops.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
114w	Advanced Forest Pathology.....				
	(3 cred.; jr., sr.; prereq., 1 or 10)				
116f	Pathological Histology				
	(3 cred.; jr., sr.; prereq., 1 or 10)				

Note.—Consult the bulletin of the College of Agriculture, Forestry, and Home Economics for program of hours, days, buildings, and instructors.

CHEMISTRY

Major Adviser: I. W. Geiger

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: Courses 6, 7, 8, or 9, 10; 12, 13; 20, 21; 35, 36.

Minor recommendation: Courses 6, 7, 8, or 9, 10; 12, 13; 20, 21; or 27 and 6 additional credits in chemistry.

For teacher's certificate in natural science see Specialized Curriculum, Part I of Education Bulletin.

PROGRAM

General Inorganic Chemistry

No.	Title	Hour	Day	Room	Instructor
1f-2w†-3s	Gen. Inorg. Chemistry (for pre-med. and pre-dent.) (12 cred.; pre-dent., pre-med.; no prereq.)	Lect. VI Sec. 1 Lab. VI, VII 2 VIII, IX	MWF TTh TTh	225C 110C	Mr. Ryerson Mr. Ryerson and assistants
4f-5w†	Gen. Inorg. Chemistry (for pre-med. and pre-dent.) (8 cred.; pre-dent., pre-med. only; prereq., entrance cred. in chem.)	Lect. VI Sec. 1 Lab. VI, VII 2 VIII, IX	MWF TTh TTh	100C 210C	Mr. Stephens Mr. Stephens and assistants
6f-7w†-8s	Gen. Inorg. Chemistry (15 cred.; those entering without chem.; no prereq.)	Lect. II Lab. I, II, III	MWF ThS	225C 210C	Miss Cohen Miss Cohen and assistants
9f-10w†	Gen. Inorganic Chemistry (10 cred.; all; prereq., entrance cred. in chem.)	Lect. II Lab. I, II, III	MWF ThS	100C 290C	Mr. Sneed Ar
9w-10s†	Gen. Inorg. Chemistry (See 9f-10w)	Lect. III Lab. VIII-IX	MWF MWF	100C 290C	Mr. Kirk Ar
11f	Qual. Chemical Anal. (for pre-med. and pre-dent.) (4 cred.; pre-med. and pre-dent. only; prereq., 3 or 5)	Lect. IV Lab. VI, VII	MWF MW	225C 290C	Miss Cohen Miss Cohen and assistants
11s	Qual. Chemical Anal. (for pre-med. and pre-dent.) (See 11f)	Lect. VI Sec. 1 Lab. VI, VII 2 VIII, IX	MWF TTh TTh	100C 210C 210C	Mr. Stephens Mr. Stephens
12f-13w†	Qual. Chemical Analysis (10 cred.; all; prereq., 8 or 10)	Fall Lect. I Lab. VI, VII, VIII Winter Lect. I Lab. VI, VII, VIII	TThS MW TTh MWF	325C 290C 325C 290C	Mr. Maynard
12s-(13f)†	Qual. Chemical Anal. (See 12f-13w)	Lect. II Lab. I, II, III	MWF ThS	100C 290C	Mr. Sneed Mr. Sneed and assistants

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
(12s)-13f†	Qual. Chemical Anal. (See 12f-13w)				
	Lect.	VI	MW	111C	Mr. Kirk
	Lab.	VII, VIII, IX VI, VII, VIII	MW F	290C	
101s	History of Chemistry..... (2 cred.; sr., grad.; prereq., 36)	Ar	Ar	Ar	Miss Cohen
102w	Adv. Qual. Chemical Anal. (2 or 3 cred.; jr., sr., grad.; pre- req., 21, 36)	Ar	Ar	290C	Mr. Sneed
103f-104w-105s	Adv. Inorg. Chemistry..... (3 to 9 cred.; jr., sr., grad.; pre- req., 21, 36)	IV	MWF	111C	Mr. Sneed
<i>Analytical Chemistry</i>					
20w-21s	Quant. Analysis (10 cred.; soph., jr., sr.; prereq., 12-13)				
	Lect.	VI	M	325C	Mr. Geiger
	Rec.	VI	F	315C	
	Lab.	VII-IX	MF	310C	
		VI-IX	W	310C	
27f,w	Quant. Analysis (for pre-med.).... (4 cred.; pre-med. only; prereq., 11 or 13)				Mr. Geiger(f) Mr. Sarver(w)
	Sec. 1	Lect.	VI	M	325C
		Rec.	VI	W	315C
		Lab.	VII-IX	MW	310C
			VI-IX	F	310C
	2	Lect.	VI	M	325C
		Rec.	VI	F	315C
		Lab.	VII-IX	MF	310C
			VI-IX	W	310C
	3 (Limit 30)	Lect.	VI	M	325C
		Rec.	VI	Th	315C
		Lab.	VI-IX	T	310C
			I-III	S	310C
			VII-IX	Th	310C
123f-124w-125s	Adv. Analytical Chemistry..... (3 to 9 cred.; jr., sr., grad.; prereq., 21 or 27)				
	Lect.	VI	T	315C	Mr. Brinton
	Lab.	VII-IX	T	310C	
		VI-IX	Th	310C	
127f-128w-129s	Chemistry of Rare Elements..... (9 cred.; jr., sr., grad.; prereq., 21)	Ar	Ar	Ar	Mr. Brinton
<i>Organic Chemistry</i>					
31w-32s†	Elem. Organic Chemistry..... (8 cred.; pre-med.; prereq., 11)				
	Lect.	IV	MWF	100C	Mr. Smith
	Sec. 1 (Limit 85)	VI-VIII	TTh	390C	Mr. Smith
	2 (Limit 30, pre-med. only)	VI-VIII	WF	390C	
	3	I-III	TTh	390C	

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
35f-36w†-37s	Organic Chemistry				
	(10 or 15 cred.; jr., sr.; prereq., 15 cred. in college chem.)				
	Lect.	III	MWF	325C	Mr. Hunter
	Rec.	III	Th	111C	Mr. Lauer
	Lab.	VI-VIII	TTh	390C	Mr. Lauer
132w	Rise and Development of Organic Chemistry	Ar	Ar	Ar	Mr. Frankforter
	(2 cred.; jr., sr.; prereq., 37)				
133f	Reagents in Organic Chemistry....	II	MWF	325C	Mr. Smith
	(3 cred.; jr., sr.; prereq., 37)				
134f	The Terpenes	Ar	Ar	Ar	Mr. Frankforter
	(2 cred.; jr., sr.; prereq., 37)				
138,139f,w,s	Adv. Organic Chemistry Lab.	Ar	Ar	390C	Mr. Hunter
	(4 to 10 cred.; jr., sr.; prereq., 37)				

Physical Chemistry

140f-141w†-142s	Physical Chemistry				Mr. McDougall
	(9, 12, or 15 cred.; jr., sr., grad.; prereq., 2 yrs. col. chem., 1 yr. col. phys.)				
	Lect.	IV	MWF	325C	
	Lab.	VI-VIII	F	15C, 117C	
	Rec.	IV	S	115C	
143f,w	Physical Chemistry (medic).....				
	(4 cred.; pre-med. and biol. students; prereq., 32)				
	Lect.	VI	TTh	225C	Ar
			F	325C	Ar
	Sec. 1 Lab.	I-III	MW	15C	Ar
	2	VII-IX	TTh	117C	Ar
146f-147w-148s	Adv. Physical Chem.	Ar	Ar	Ar	Ar
	(9 or 12 cred.; jr., sr., grad.; prereq., 142 and calculus)				
149s	Prin. of Colloidal Chemistry.....		<i>Not offered in 1925-26.</i>		
	(2 cred.; sr., grad.; prereq., 141)				
150s	Appl. of Colloidal Chemistry.....	Ar	Ar	Ar	Mr. Reyerson
	(2 cred.; sr., grad.; prereq., 141)				
157f-158w-159s	Colloid Chemistry Lab.	Ar	Ar	Ar	Mr. Reyerson
	(Cred. ar.; sr., grad.; prereq., 149 or 150)				

Technological Chemistry

161f-162w-163s	Food Analysis				
	(9 cred.; jr., sr., grad.; prereq., 20-21)				
	Lect.	IV	T	215C	Mr. Harding
	Lab.	VI, VII, VIII, IX	F	217C	Mr. Harding
		II, III	F		

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

AGRICULTURAL BIOCHEMISTRY

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

Introductory Courses

No.	Title	Hour	Day	Room	Instructor
3f-4w	Types of Carbon Compounds.... (6 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
3w-4s	Types of Carbon Compounds.... (See 3f-4w)				
7f-8w	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
7w-8s	General Agricultural Biochemistry (10 cred.; soph., jr., sr.; prereq., chem. 10 cred.)				
15f,s	Principles of Animal Nutrition... (3 cred.; jr., sr.; prereq., 7-8)				

Advanced Courses

101f-102w	Agricultural Quantitative Analy- sis				
	(6 cred.; jr., sr.; prereq., 7-8)				
103s	Dairy Chemistry				
	(5 cred.; jr., sr.; prereq., 7-8)				
106f	Chem. Tech. of Agricultural Prod- ucts				
	(5 cred.; sr.; prereq., 101-102)				
108s	Chemistry of Wheat and Wheat Products				
	(3 cred.; jr., sr.; prereq., 7-8)				
110s	Flour Laboratory Methods.....				
	(5 cred.; jr., sr.; prereq., 101-102)				
111f,su-112w,su	Phytochemistry				
	(6 cred.; sr.; prereq., biol. 9 cred., org. chem.)				
113f,su-114w,su- 115s	Biochemical Laboratory Methods..				
	(6 cred.; sr.; prereq., quant. anal., parallel 111-112)				
116w	Advanced Animal Nutrition.....				
	(2 cred.; jr., sr.; prereq., 15 or equiv.)				
117f,w,s,su	Laboratory Problems in Animal Nutrition				
	(3 to 5 cred.; jr., sr.; prereq., 116, permission of instructor)				
118f,w,s,su	Laboratory Problems in Biochem- istry				
	(3 or 5 cred.; sr.; prereq., 111- 112, 113-114-115; or 103 or 110)				

NOTE.—Consult the bulletin of the College of Agriculture, Forestry, and Home Economics for program of hours, days, buildings, and instructors.

COMPARATIVE LITERATURE

No.	Title	Hour	Day	Room	Instructor
101f-102w-103s†	Drama (9 cred.; jr., sr., grad.; prereq., jun. col. requirement in Eng. and foreign lang.)	III	TThS	113F	Mr. Firkins
105f-106w-107s†	Criticism (9 cred.; jr., sr., grad.; prereq., jun. col. requirement in Eng. and foreign lang.)	VI	MWF	113F	Mr. Firkins
110w	Romantic Movement (3 cred.; sr., grad.; prereq., per- mission of instructor)	II	TThS	113F	Mr. Firkins

COMPARATIVE PHILOLOGY

No.	Title	Hour	Day	Room	Instructor
101-102†	<i>Science of Language</i> (4 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered in 1925-26.</i>			
103	<i>Universal Language</i> (2 cred.; jr., sr., grad.; prereq., see note)	<i>Not offered in 1925-26.</i>			
105s	Life of Words (2 cred.; jr., sr., grad.; prereq., see note)	VI	TTh	217F	Mr. Klaeber
108s	Comparative Phonetics (3 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Kroesch
109f-110w-111s†	History of German Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Klaeber
141f-142w-143s†	Hist. Gram. of Eng. Lang. (6 cred.; jr., sr., grad.; prereq., see note)	Ar	Ar	Ar	Mr. Klaeber

DRAWING AND DESCRIPTIVE GEOMETRY

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Room	Instructor	
41-42-43f,w,s	Technical Drawing (6 cred.; all; no prereq.)	Sec. 1	I, II	MWF	455C	Mr. Cederberg
		2	III, IV	MWF		
		3	VIII, IX	MWF(f,w)		
44f,w,s	Lettering (1 cred.; all; no prereq.)	Sec. 1	IV	T	217E	Mr. Schuck, Mr. Levens
		2	II	Th	107E	
45f,w,s	Alphabets (2 cred.; soph., jr., sr.; no prereq.)	II	TTh	217E	Mr. Kirchner, Mr. Levens	
47f-48w-49s	Drawing, Engraving, and Decoration (9 cred.; jr., sr.; † no prereq.)	II	MWF	208E	Mr. Kirchner	

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

NOTE.—Prerequisite for all courses, one of the following groups: (1) five years' foreign language; four may be in high school and one in college; (2) two years' foreign language in college; (3) 4 credits in Old English.

COLLEGE OF EDUCATION

ECONOMICS

Major Adviser: G. W. Dowrie

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate.—Major recommendation in commercial subjects, Economics 1-2, 5, 6-7, 25-26, and 15 credits from the following group: 90, 143-144, 161, 191-192; Political Science 51-52-53; Geography 11-12.

For teacher's certificate in social studies see specialized curriculum.

No.	Title	Hour	Day	Room	Instructor
1f-2w†	Introduction to Economics..... (10 cred.; fr. pre-bus. students; no prereq.)				Mr. Black and others
	Lect.	III	TTh	OLAud	
	Sec. 1	I	TThS	6B	
	2	I	TThS	106B	
	3	II	TThS	213B	
	4	II	TThS	209B	
	5	I	MWF	109B	
	(Sections limited to 25 students each)	6	II	MWF 209B	
		7	III	MWF 213B	
		8	III	MWF 6B	
		9	IV	MWF 106B	
		10	V	MWF 109B	
		11	VI	MWF 109B	
		12	VI	MWF 6B	
		13	VI	MWF 109B	
		14	VI	MWF 209B	
		15	VIII	MWF 202B	
		16	VIII	MWF 6B	
3s	The Mechanism of Exchange..... (5 cred.; fr. pre-bus. and majors in economics; no prereq.)				Mr. Dowrie and others
	Lect.	III	TTh	OLAud	
	Sec. 1	I	TThS	6B	
	2	I	TThS	102B	
	3	II	TThS	102B	
	4	II	TThS	213B	
	5	III	MWF	213B	
	(Sections limited to 25 students each)	6	IV	MWF 109B	
		7	IV	MWF 106B	
		8	V	MWF 201B	
		9	VI	MWF 109B	
		10	VI	MWF 202B	
4f*	Principles of Economics—Pre-Business Course (5 cred.; soph., pre-bus. only; pre-req., 1-2)				Mr. Hansen and others
	Lect.	II	T	MuAud	
	Sec. 1	I	TThFS	213B	
	2	II	MWFS	202B	
	(Sections limited to 25 students each)	3	II	MWFS 6B	
		4	III	TThFS 109B	
		5	IV	MWFS 213B	
		6	V	MTWF 202B	
		7	VI	MWThF 102B	
		8	VII	MWThF 6B	

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

* Open to pre-business students only.

No.	Title	Hour	Day	Room	Instructor
4w*	Principles of Economics—Pre-Business Course (Pre-bus.; see 4f)				Mr. Hansen and others
	Lect.	II	T	MuAud	
	Sec. 1	II	MWFS	109B	
	(Sections limited to 2	IV	MWFS	109B	
	25 students each)	3	MTWF	102B	
		4	MWThF	202B	
		VI			
4s*	Principles of Economics—Pre-Business Course (Pre-bus.; see 4f)				Mr. Hansen and others
	Lect.	II	T	202B	
	Sec. 1	I	TThFS	109B	
	(Sections limited to 2	III	TThFS	6B	
	25 students each)	3	MWThF	6B	
		VI			
6w-7s†¶	Principles of Economics—General Course (10 cred.; soph., jr., sr.; no pre-req.)				Mr. Hansen and others
	Lect.	II	Th	301F	
	Sec. 1	I	TThFS	213B	
		2	MWFS	6B	
	(Sections limited to 3	III	TThFS	106B	
	25 students each)	4	MWFS	6B	
		5	MWThF	213B	
		VI			
6s(7f)†¶§	Principles of Economics—General Course (See 6w-7s)				Mr. Hansen and others
	Lect.	II	W	Ar	
	Sec. 1	II	MTThS	106B	
	(Sections limited to 2	IV	MWFS	213B	
	25 students each)	3	MWThF	209B	
		VI			
(6s)-7f††	Principles of Economics—Old Course				Mr. Hansen and others
	Lect.	II	Th	301F	
	Sec. 1	II	MWFS	109B	
	(Sections limited to 2	III	MWFS	106B	
	25 students each)	3	MWFS	6B	
		4	MTWF	6B	
		V			
14s	Elements of Statistics..... (5 cred.; soph., jr., sr.; prereq., 4 or 6-7)				Mrs. Kittredge and others
	Lect.	III	MW	OLAud	
	Sec. 1	I, II	MW	301B	
		2	ThS	301B	
		3	TS	301B	
		4	WF	301B	
		5	TTh	301B	
		6	WF	301B	
		7	TTh	301B	
		8	M	301B	
			F	301B	
			M	301B	
			F	301B	

* Open to pre-business students only.

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

‡ Second quarter of Course 6-7 as offered in 1925-26.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

§ Open with permission to third quarter pre-legal freshmen.

¶ Not open to pre-business students.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor	
25f-26w†	Principles of Accounting.....				Mr. Heilman and others	
	(8 cred.; soph., jr., sr.; no prereq.)					
	Lect. Sec. 1	I	MWF	301B		
	2	I	TThS	301B(fall)		
	3	II	MWF	301B		
	4	II	TThS	301B		
	(Sections limited to	5	III	MWF		301B(fall)
	30 students each)	6	III	TThS		301B
	7	IV	MWF	301B(fall) 213B(winter)		
	8	V	MWF	301B(fall)		
	9	VI	MWF	301B		
	10	II	MWF	303B(fall) 213B(winter)		
	Lab. Sec. 1	VI, VII	M	303B		
	2	I, II	T	302B		
	3	VI, VII	W	303B(fall)		
	4	VI, VII	Th	303B		
	5	VI, VII	F	303B		
	6	VII, VIII	M	301B		
	7	VII, VIII	T	301B(fall)		
	(Sections limited to	8	VII, VIII	W		301B
18 students each)	9	VII, VIII	Th	301B		
10	VII, VIII	F	301B(fall)			
11	VIII, IX	T	303B			
12	VIII, IX	W	303B(fall)			
13	III, IV	T	303B			
14	II, III	Th	302B			
15	III, IV	S	303B			
16	III, IV	F	302B			
25w-26s†	Principles of Accounting				Mr. Heilman and others	
	(See 25f-26w)					
	Lect. Sec. 1	II	MWF	303B		
	2	I	TThS	303B		
	(Sections limited to	3	III	MWF		303B
	30 students each)	4	IV	MWF		301B(winter) 302B(spring)
	5	VI	MWF	302B(winter)		
	Lab. Sec. 1	VI, VII	T	303B		
	2	III, IV	W	302B(winter) 301B(spring)		
	3	VIII, IX	M	303B		
	(Sections limited to	4	VIII, IX	W		303B
	18 students each)	5	II, III	S		302B
6	VII, VIII	F	301B(winter) 303B(spring)			
7	VI, VII	W	303B			
8	VII, VIII	T	301B(winter)			
62s	Social Insurance	III	TThS	102B	Mr. Graves	
	(3 cred.; jr., sr.; prereq., 4 or 6-7)					
72f	Economics of Transportation.....					
	(3 cred.; jr., sr.; prereq., 4 or 6-7)					
	(Sections limited to	Sec. 1	VI	MWF	202B	Mr. Cummings
	30 students each)	2	VII	MWF	202B	
72w	Economics of Transportation.....	VI	MWF	102B	Mr. Cummings	
	(See 72f)					
	(Limited to 30 students)					

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
72s	Economics of Transportation..... (See 72f) (Limited to 30 students)	VII	MWF	202B	Mr. Cummings
74s	Transportation Problems (3 cred.; jr., sr.; prereq., 72)	VI	MWF	102B	Mr. Cummings
85f,s	Principles of Marketing..... (3 cred.; jr., sr.; prereq., 4 or 6-7)	Lect. I Sec. 1 I 2 I 3 III	T ThS WF ThS	202B 202B 209B 213B	Mr. Vaile
103f-104w†	Value and Distribution (6 cred.; jr., sr., grad.; prereq., 4 or 6-7)	Sec. 1 I 2 VII	MWF MWF	106B 102B	Mr. Garver, Mr. Waite
105	<i>History of Economic Ideas (The Classical Economists)</i> (3 cred.; jr., sr., grad.; prereq., 103-104)		<i>Not offered in 1925-26.</i>		
106s	History of Economic Ideas..... (The Critics of the Classical Economists) (3 cred.; jr., sr., grad.; prereq., 105 or permission of instructor)	IV	MWF	202B	Mr. Hansen
108w	Marketing Organization: Agricultural Products (3 cred.; jr., sr., grad.; prereq., 85)	VIII	MWF	102B	Mr. Price
113w-114s	Theory of Statistics..... (6 cred.; jr., sr., grad.; prereq., 14)	I	MWF	6B	Mrs. Kittredge
143f-144w†	The Financial System..... (8 cred.; jr., sr., grad.; prereq., 4 or 6-7)	Lect. III Sec. 1 VIII 2 II 3 II 4 II 5 III 6 III 7 V 8 VI	W MTW MWF MWF TThS TThS TThS MWF MWF	MuAud 209B 106B 102B 106B 209B 202B(fall) 109B(winter) 209B 209B	Mr. Dowrie and others
143w-144s†	The Financial System..... (See 143f-144w)	Lect. IV Sec. 1 II 2 IV 3 VII	S MWF MWF MWF	202B 104B(winter) 209B(spring) 104B 202B(winter) 102B(spring)	Mr. Dowrie, Mr. Farmer

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
149w	Business Cycles (3 cred.; jr., sr., grad.; prereq., 143-144, 155)				Mr. Ebersole
	Lect.	IX	MT	202B	
	Sec. 1	IX	W	202B	
	2	IX	W	209B	
	3	Ar	Ar	Ar	
149s	Business Cycles (See 149w)				
	Lect.	VIII	MT	202B	Mr. Ebersole
	Sec. 1	VIII	W	202B	
	2	VIII	W	209B	
	3	Ar	Ar	Ar	
153w	Trust Problem (3 cred.; jr., sr., grad.; prereq., 155)	II	MWF	202B	Mr. Stehman
154s	Public Utilities (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Econ. 4 or 6-7)	II	MWF	102B	Mr. Garver
155s	Corporation Finance (3 cred.; jr., sr., grad.; prereq., 143-144)				Mr. Stehman
	Lect.	III	Th	301F	
	Sec. 1	II	MW	109B	
	2	III	MW	6B	
	3	III	MW	202B	
	4	IV	MW	209B	
	5	VI	TTh	102B	
	6	VII	TTh	102B	
161f	Labor Problems and Trade Union- ism (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				Mr. Hansen
	Lect.	IV	MW	202B	
	Sec. 1	IV	F	202B	
	2	IV	F	109B	
	3	II	F	213B	
161w	Labor Problems and Trade Union- ism (See 161f)	III	TThS	202B	Mr. Hansen
162w	Labor Movement in America and England (3 cred.; jr., sr., grad.; prereq., 161)	IV	MWF	202B	Mr. Hansen
163	<i>Economic Aspects of Population and Immigration</i> (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	<i>Not offered in 1925-26.</i>			
169	<i>Labor and Socialist Movement in Europe</i> (3 cred.; jr., sr., grad.; prereq., 161)	<i>Not offered in 1925-26.</i>			
170s	Land Economics (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	2:30-4:00	TTh	209B	Mr. Black

No.	Title	Hour	Day	Room	Instructor
176f	Commercial Policies (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	I	MWF	202B	Mr. Blakey
176s	Commercial Policies (See 176f)	I	MWF	202B	Mr. Blakey
191f-192w†	Public Finance (6 cred.; jr., sr., grad.; prereq., 4 or 6-7)				Mr. Blakey
	Sec. 1	III	MWF	209B	
	2	IV	MWF	209B	
193s	State and Local Taxation..... (3 cred.; jr., sr., grad.; prereq., 191-192)	III	MWF	209B	Mr. Blakey

ENGLISH

Major Advisers: C. W. Nichols, Rewey B. Inglis

REQUIREMENTS OF THE DEPARTMENT

For teacher's certificate in English.—

- English as the major subject: English-Rhetoric A-B-C; English 6 and 8, either 44-45 or 62, and six additional credits from Courses 44-45, 50, 62, and courses numbered 100 and above; Rhetoric 11-12 or 18-19 and 20; Public Speaking 41-42-43 or 45-46.
- English as a minor subject: English-Rhetoric A-B-C; English 6 and 8 and either 44-45 or 62; Rhetoric 11-12 or 18-19 and 20.
- Public Speaking as the minor subject: a student must satisfy the department that he is actively interested in some phase of public speaking either as a member of a literary or debating society or a participant in a contest or dramatic performance, or as a lecturer; he must complete the following courses: English-Rhetoric A-B-C; Public Speaking 41-42-43, and 9 additional hours in public speaking.

No.	Title	Hour	Day	Room	Instructor
A-B-C	Freshman English (See Composition)				
1f-2w-3s*	English Survey (9 cred.; soph., jr., sr.; prereq., 9 cred. in composition)				
	Sec. 1 Lect.	II	M	OLAud	
	Rec.	II	WF	110F	
	2 Lect.	II	M or		
	Rec.	IV	T	OLAud	
	3 Lect.	III	WF	113F	
	Rec.	II	M or		
	4 Lect.	IV	T	OLAud	
	Rec.	VII	TTh	107F	
6f	Chaucer (4 cred.; soph., jr., sr.; prereq., A-B-C or equiv.‡)				
	Sec. 1	II	TWThS	205F	Mr. Dunn, Mr. Ruud
	2	V	MTWF	204F	Miss Carr

* Students may enter any quarter.

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

‡ Course A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
6w	Chaucer				
	(See 6f)				
	Sec. 1	II	TWThS	205F	Mr. Ruud
	2	V	MTWF	204F	Mr. Van Winkle, Miss Carr
6s	Chaucer				
	(See 6f)				
	Sec. 1	II	TWThS	204F	
	2	V	MTWF	204F	Mr. Ruud, Mr. Van Winkle
8f	Shakespeare				
	(4 cred.; soph., jr., sr.; prereq., A-B-C or equiv.†)				
	Sec. 1	I	TThFS	204F	Miss Jackson, Mr. Nichols
	2	VI	MTThF	204F	Mr. Hillhouse, Mr. Van Winkle
8w	Shakespeare				
	(See 8f)				
	Sec. 1	I	TThFS	204F	Mr. Dunn, Mr. Van Winkle
	2	VI	MTThF	204F	Mr. Hillhouse, Mr. Ruud
8s	Shakespeare				
	(See 8f)				
	Sec. 1	I	TThFS	204F	Miss Jackson, Mr. Van Winkle
	2	VI	MTThF	204F	Mr. Hillhouse, Mr. Nichols
40s	Bible as Literature.....				
	(3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.†)				
	Lect.	III	MW	301F	Mr. Burton
	Sec. 1 Rec.	IV	T	311F	
2	III	T	311F		
3	IV	S	209½F		
	4	III	Th	311F	
42s	Browning				
	(3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.† Not open to students with credit for 41)				
	Lect.	IV	MW	301F	Mr. Burton
	Sec. 1 Rec.	II	F	311½F	
	2	III	F	311½F	
	3	III	Th	305F	
	4	II	T	207F	
5	IV	T	311½F		
6	VI	T	306F		

† Course A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
44f-45w†	American Literature (6 cred.; soph., jr., sr.; prereq., A-B-C or equiv.‡)	IV	MWF	301F	Mr. Moore, Miss Jackson
44w-45s†	American Literature (See 44f-45w)	VI	MWF	301F	Mr. Moore, Mr. Nichols
50f	Old English (4 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	III	TThFS	306F	Mr. Ruud
51w	Spenser (3 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	VI	MWF	205F	Mr. Stoll
53	<i>Seventeenth-Century Lyrists</i> (4 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	<i>Not offered in 1925-26.</i>			
58f-59w†	Nineteenth-Century Prose (6 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	II	TThS	204F	Mr. Beach
60w	History of English Language... (2 cred.; jr., sr.; prereq., 50)	VI	TTh	205F	Mr. Klaeber
61s	Present-Day English (3 cred.; soph., jr., sr.; prereq., A-B-C or equiv.‡)	I	TThS	114F	Mr. Ruud
62f	Milton (4 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	VII	MTWF	204F	Mr. Van Winkle
62w	Milton (See 62f)	VII	MTWF	204F	Mr. Stoll
64s	Bacon (3 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	VI	MWF	205F	Mr. Dunn
66	<i>English Novel</i> (4 cred.; jr., sr.; prereq., A-B-C or equiv.‡)	<i>Not offered in 1925-26.</i>			
70f	Elizabethan Drama (4 cred.; jr., sr.; prereq., 8)	VI	MTWF	205F	Mr. Stoll
101f	Middle English (2 cred.; jr., sr., grad.; prereq., 6 and 50)	VI	TTh	217F	Mr. Klaeber
103s	Beowulf (3 cred.; jr., sr., grad.; prereq., 50 and either 6 or 8)	VI	MWF	217F	Mr. Klaeber
105w-106s†	Eighteenth-Century Poetry (6 cred.; jr., sr., grad.; prereq.§)	VII	MWF	205F	Mr. Moore
107-108†	<i>Eighteenth-Century Prose</i> (6 cred.; jr., sr., grad.; prereq.§)	<i>Not offered in 1925-26.</i>			
109f-110w†	Romantic Poets (6 cred.; jr., sr., grad.; prereq.§)	III	TThS	204F	Mr. Beach
111f-112w†	Seventeenth-Century Prose (6 cred.; jr., sr., grad.; prereq.§)	III	MWF	204F	Mr. Moore
123f-124w-125s†	Victorian Novelists (9 cred.; jr., sr., grad.; prereq.§)	4 to 6 o'clock	T	204F	Mr. Beach

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

‡ Course A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

§ Courses 6 and 8, or either 6 or 8 and one other course numbered above 5.

No.	Title	Hour	Day	Room	Instructor
129s	Modern Drama (4 cred.; sr. and grad. only; pre-req., 8, one other course numbered above 5, and permission of chairman of the department)	II	MWThF	321F	Mr. Burton
133w	Ballads (3 cred.; jr., sr., grad.; prereq.§)	III	MWF	205F	Mr. Ruud
136s	Advanced Shakespeare (4 cred.; jr., sr., grad.; prereq., grade of B in Eng. 8)	I	TThFS	205F	Mr. Stoll
140s	Advanced Chaucer (4 cred.; jr., sr., grad.; prereq., 6 and one other course numbered above 5, or 6 with grade of B)	II	TWThS	205F	Mr. Ruud
141f-142w-143s†	Historical Grammar (6 cred.; sr., grad.; prereq.§)	Ar	Ar	Ar	Mr. Klaeber
146-147†	<i>The Metrical Romances</i> (6 cred.; jr., sr., grad.; prereq., 6, and one other course numbered above 5)	<i>Not offered in 1925-26.</i>			
148f-149w†	The Arthurian Romances..... (6 cred.; jr., sr., grad.; prereq., 6, and one other course numbered above 5)	VIII	MWF	205F	Ar
150f	Victorian Poetry (4 cred.; jr., sr., grad., prereq.§)	VII	MTWF	205F	Mr. Stoll
151s	Recent Poetry (4 cred.; jr., sr., grad.; prereq.§)	III	TWThS	204F	Mr. Beach
152w-153s†	Pre-Elizabethan Drama (6 cred.; jr., sr., grad.; prereq., 8, and one other course numbered above 5)	III	TThS	205F	Ar
155	<i>American Novel</i> (4 cred.; jr., sr., grad.; prereq., 44-45 and either 6 or 8)	<i>Not offered in 1925-26.</i>			
164s	Dante in English..... (See Italian 164s)	IV	MWF	203F	Miss Phelps

COMPOSITION

Af,w,s-Bf,w,s- Cf,w,s	Freshman English	Hour	Day	Room	
Students may begin any quarter. They will take the literature given that quarter in English 1f-2w-3s and be assigned to sections according to their previous training in composition. To avoid duplication of the literature part of the course, a student must take the course during one fall, one winter, and one spring quarter.	Freshman English	Lect. II	M	OLAud	
		Rec. I	TThFS	*	
			TThFS	*	
		Lect. IV	T	OLAud	
		Rec. III	MWFS	*	
			IV	MWFS	*
		Lect. II	M	OLAud	
		or			
		IV	T	OLAud	
		Rec. V	MTWF	*	
			VI	MTThF	*
			VII	MTThF	*
		VIII	MTThF	*	

* Assigned at time of registration.

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

§ Courses 6 and 8, or either 6 or 8 and one other course numbered above 5.

PROGRAM

No.	Title	Hour	Day	Room	Instructor	
4f-5w-6s	Composition for Technical Students (9 cred.; all; no prereq.)	I	MWF	311F		
		II	MWF	311F		
		III (Chemists only)	MWF	225C, 315C		
		I	TThS	311F		
4w-5s-(6su)	Composition for Technical Students (9 cred.; all; no prereq.)	II	TThS	311F		
11f-12w†¶	Description; Narration (6 cred.; soph., jr., sr.; prereq., A-B-C, or 4-5-6)	Sec. 1	II	MWF	304F	Ar
		2	IV	MWF	305F	Mr. Nichols
		3	VII	MWF	305F	Miss Chase
		4	II	TThS	304F	Mrs. Phelan
		5	III	TThS	305F	Miss Macgregor
11w-12s†¶	Description; Narration (Sec 11f-12w)	Sec. 1	II	MWF	306F	Mr. Hillhouse
		2	II	TThS	306F	Ar
		3	VI	MWF	306F	Miss Gable
18f-19w†¶	Types of Writing (6 cred.; soph., jr., sr.; prereq., A-B-C or 4-5-6)	Sec. 1	III	TThS	304F	Miss Armstrong
		2	III	MWF	305F	Ar
		3	V	MWF	303F	Mr. Loveland
		4	VII	MWF	306F	Miss Macgregor
18w-19s†¶	Types of Writing (Sec 18f-19w)	Sec. 1	III	MWF	306F	Mrs. Phelan
		2	VII	MWF	304F	Mr. Hessler
20f*	Informal Exposition (3 cred.; soph., jr., sr.; prereq., 11-12 or 18-19)	Sec. 1	III	MWF	302F	Mrs. Phelan
		2	V	MWF	305F	Mr. Hessler
20s*	Informal Exposition (See 20f)	Sec. 1	II	MWF	304F	Ar
		2	IV	MWF	305F	Mr. Nichols
		3	VI	MWF	303F	Miss Armstrong
		4	VII	MWF	305F	Miss Chase
		5	II	TThS	304F	Mrs. Phelan
		6	III	TThS	306F	Miss Macgregor

* Assigned at time of registration.

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

¶ A student registering for either 11-12 or 18-19 must bring with him a written memorandum from his instructor in Freshman English specifying which course in sophomore composition he should elect. No student may receive credit for both 11-12 and 18-19.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

No.	Title	Hour	Day	Room	Instructor
31w	Technical Writing	Consult	College of Engineering	bulletin.	
63f-64w-65s	Studies in Structure and Style. (6 cred.; jr., sr.; prereq., 11-12 or 18-19, and 20)	III	MWF	304F	Mr. Nichols
67f-68w†	Imitative Writing	IV	MWF	304F	Miss Chase, Mrs. Phelan
69s	Short Story-Writing	IV	MTWF	304F	Miss Chase, Mrs. Phelan
100-101	<i>Verseification</i>	<i>Not offered in 1925-26.</i>			
111-112-113	<i>Essay Writing</i>	<i>Not offered in 1925-26.</i>			
115-116-117	<i>Dramatic Technique</i>	<i>Not offered in 1925-26.</i>			
119f-120w-121s	Seminar in Writing.....	VI, VII	Th	304F	Mr. Thomas

PUBLIC SPEAKING

41f-42w-43s†	Public Speaking				
	(9 cred.; soph., jr., sr.; prereq., Composition A-B-C, or 4-5-6)				
	Sec. 1	I	MWF	308F	Mr. Gray
	2	II	MWF	308F	Miss Smith
	3	III	TThS	308F	Miss Smith
	4	VII	MWF	19Mu	Mr. Raines
	5	I	TThS	3F	Ar
	6	II	TThS	308F	Miss Smith
	7	II	MWF	Ar	Mr. Morse
41w-42s-(43f)†	Public Speaking				
	(See 41f-42w-43s)				
	Sec. 1	VI	MWF	19Mu	Ar
	2	I	MWF	19Mu	Ar
	(For engineers only) 3	IV	MWF	*	Mr. Gray
(41w-42s)-43ff	Public Speaking	II	MWF	19Mu	Ar
	(See 41f-42w-43s)				
45f-46w†	Public Speaking				
	(10 cred.; soph., jr., sr.; prereq., Composition A-B-C, or 4-5-6)				
	Sec. 1	IV	MTWFS	3F	Ar
	2	VII	MTWThF	308F	Mr. Rarig
	3	VIII	MTWThF	308'	Mr. Morse

* Electric light room in Electrical Engineering building.

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

§ Open to intercollegiate debaters and orators.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

‡ Students majoring in Public Speaking may register for courses in the College of Education by petition.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
45s-(46f)†	Public Speaking				
	(See 45f-46w)				
	Sec. 1	IV	MTWFS	3F	Ar
	2	VI	MTWThF	125F	Mr. Morse
	3	VII	MTWThF	308F	Mr. Rarig
(45s)-46f†	Public Speaking	VI	MTWThF	308F	Mr. Gray
	(See 45f-46w)				
45w-46s†	Public Speaking	VI	MTWThF	308F	Mr. Gray
	(See 45f-46w)				
55f-56w-57s	Arg. and Debating.....	VII	MWF	6F	Mr. Morse
	(9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
59s	Advanced Public Speaking.....	II	MWF	Ar	Mr. Morse
	(3 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
81f-82w-83s	Interpretative Reading				
	(9 cred.; jr., sr.; prereq., 41-42-43 or 45-46)				
	Sec. 1	IV	MWF	308F	Mr. Rarig
	2	I	TThS	308F	Ar
91f-92w-93s	Play Production	VIII	MWF	19Mu	Mr. Raines
	(9 cred.; jr., sr.; prereq., 81-82- 83, Eng. 8)				
97f,w	Adv. Debate and Oratory	Ar	Ar	308F	Mr. Rarig, Mr. Morse
	(3 cred.; jr., sr.; prereq.§)				
101f-102w	Advanced Speech Composition...	III	MWF	308F	Mr. Rarig
	(6 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46)				
105s	Theory of Reading and Acting...	III	MWF	308F	Mr. Rarig
	(3 cred.; jr., sr., grad.; prereq., 41-42-43 or 45-46)				

GEOLOGY AND MINERALOGY

REQUIREMENTS OF THE DEPARTMENT

For the teacher's certificate in geography.—Major recommendation: A minimum of 28 credits from the following courses in Geography: 51, 52, 61, 62, 71, 75, 81, 91, 93, 95. An additional five credits from the following courses in Geology: 1, 20.

Minor recommendation: 19 credits as follows: (a) 10 credits from 29 or 1, 30, 37; (b) 114, and one other regional course required.

GEOGRAPHY

Major Adviser: Darrell H. Davis

No.	Title	Hour	Day	Room	Instructor
(1s)-2f†	Introd. to Human Geography...	II	MWThFS	101OL	Mr. Hartshorne
	(10 cred.; 3rd qtr. fr., soph.; jr., sr. by permission; prereq., Course 1 as given in 1924-25)				
1w	Introd. to Human Geography...	II	MWThFS	101OL	Mr. Hartshorne
	(5 cred.; 3rd qtr. fr., soph.; not open to jr., sr.; no prereq.)				

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

‡ Course 2 is the second half of Course 1-2 given in 1924-25.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

§ Open to intercollegiate debaters and orators.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
1s	Introd. to Human Geography.... (See 1w)	II	MWThFS	101OL	Mr. Hartshorne
33w*	Climatology (3 cred.; soph., jr., sr.; no prereq.)	VI	TThF	101OL	Mr. Davis
51f‡	Human Geography (5 cred.; jr., sr.; prereq., 10 cred. in economics or sociology, or 15 cred. in history)	III	MTThFS	101OL	Mr. Davis
51w‡	Human Geography (See 51f)	III	MTThFS	101OL	Mr. Davis
52s	Introductory Regional Geography (5 cred.; jr., sr.; prereq., 51 or 1 and 10 cred. in economics)	III	MTThFS	101OL	Mr. Davis
61f	Geography of Commercial Pro- duction (5 cred.; jr., sr.; prereq., 10 cred. in economics or geography)	IV	MTWFS	101OL	Mr. Hartshorne
61w	Geography of Commercial Pro- duction (See 61f)	IV	MTWFS	101OL	Mr. Hartshorne
61s	Geography of Commercial Pro- duction (See 61f)	IV	MTWFS	101OL	Mr. Hartshorne
62s	Trade Routes and Trade Centers (3 cred.; jr., sr.; prereq., 61)	I	TThS	101OL	Mr. Hartshorne
71f	Geography of North America.... (4 cred.; jr., sr.; prereq., 1-2 or 51, or 61, or 25 cred. in social science to include at least one course in geography)	VI	MTThF	101OL	Mr. Davis
75	<i>Geography of Europe</i> (3 cred.; jr., sr.; prereq., 51 or 61)	<i>Not offered in 1925-26.</i>			
81s	Geography of Minnesota..... (3 cred.; jr., sr.; prereq., 12 cred. in geography or 20 cred. in social science to include at least 8 cred. in geography.) (Limited to 15. Permission of instructor necessary)	VI	TThF	101OL	Mr. Davis
91f	Cartography (3 cred.; jr., sr.; prereq., 10 cred. in senior college work in geog- raphy, geology, history, or other subject in which the use of maps is necessary)	I	TThS	101OL	Mr. Hartshorne
95s	Field Course for Teachers..... (3 cred.; jr., sr., grad.; prereq., 71, 75, or 81. Permission of instructor necessary. Limited to 12)	To be arranged			Mr. Davis
101f,w,s	Research Problems in Geography (Credits and hours to be ar- ranged)				Mr. Davis

* Not open to those who have had Courses 1 or 5.

‡ Not open to those who have had Course 1.

PROGRAM

COURSES IN GEOLOGY

No.	Title	Hour	Day	Room	Instructor
1f-2w*†	General Geology (Dynamic and Historical) (10 cred.; all; prereq., any course in chemistry in high school or college)				
	Sec. 1	Lect. I	TWThF	200aP	Mr. Thiel
		Lab. I-II	M	112P	
	2	Lect. VII	MTWTh	110P	Mr. Erdmann
		Lab. VI-VII	F	112P	
1f-3w*†	General Geology (Dynamic and Economic) (10 cred.; all; prereq., any course in chemistry in high school or college)				
		Lect. III	MTThF	110P	Mr. Emmons
		Lab. III-IV	W	112P	
		or VI-VII	Th		
1w-2s*†	General Geology (Dynamic and Historical) (See 1f-2w)				
		Lect. IV	TWFS	110P	Mr. Graham
		Lab. III-IV	M	112P	
		or VI-VII	T		
1w-3s*†	General Geology (Dynamic and Economic) (See 1f-3w)				
		Lect. II	WThFS	200aP	Mr. Allison
		Lab. I-II	T	112P	
1s-2f*†	General Geology (Dynamic and Historical) (See 1f-2w)				
		Lect. III	MTThF		
			(spring)	110P	Mr. Emmons
		Lab. III-IV	W		
			(spring)	112P	
		Lect. III	MTWTh		
			(fall)	104P	Mr. Graham
		Lab. II-III	F		
			(fall)	112P	
1s-(3w)†	General Geology (Dynamic and Economic) (See 1f-3w)	Hours, days, rooms are the same as for 1s-2f			
4s	Geology of Minnesota (5 cred.; all; prereq., 1)	IV	MTWFS	110P	Mr. Thiel
8w†	Introductory Geology (5 cred.; all; no prerequisites)	II	MWThFS	110P	Mr. Thiel
8s†	Introductory Geology (See 8w)	II	MWThFS	110P	Mr. Thiel

* For a three-quarter sequence, Course 2 may be followed by Course 3 or 4 or 11, and Course 3 by Course 2.

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

‡ Does not satisfy the junior college requirement for science. May be followed by Course 2 or 4 with instructor's permission.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

No.	Title	Hour	Day	Room	Instructor
11f	Elements of Paleontology..... (5 cred.; all; prereq., 1)	II	MWThFS	105P	Mr. Stauffer
15s¶	Minerals and Rocks..... (1 cred.; jr., sr.; prereq., 1 or 29)	Ar	Ar	100P	Mr. Gruner
23w-24s-(25f)†	Elements of Mineralogy..... (10 cred.; soph., jr., sr.; prereq., course in chem.)				
	(Winter) Lect.	II	WF	110P	Mr. Gruner
	Lab.	III	WF	100P	
	(For other sections, see Mines bulletin)				
	(Spring) Lect	II	MWF		Mr. Gruner
	Rec.	IX	T		
	Sec. 1 Lab.	VII, VIII	M		
		VI, VII	T		
	2	III, IV	M		
		VII, VIII	F		
(23w-24s)-25f†	Elements of Mineralogy..... (See 23w-24s-(25f))				
	Lect.	III	MWF		Mr. Gruner
	Rec.	VIII	F		
	Sec. 1 Lab.	VI, VII	MW		
	2	{ VII, VIII	T		
		{ VI, VII	F		
27s¶	Outlines of Mineralogy..... (1 cred.; jr., sr.; no prereq.)	Ar	Ar	100P	Mr. Gruner
29f§	General Physiography..... (5 cred.; soph., jr., sr.; no prereq.)	III	MTThFS	200aP	Mr. Allison
61f	Blowpipe Analysis..... (3 cred.; jr., sr.; prereq., 25)	Consult	Mines program		Mr. Gruner
65f	Crystallography..... (3 cred.; jr., sr.; prereq., Math. 7 and Chem. 6-7-8 or 9-10)	Ar	Ar	100P	Mr. Gruner
67w	Mineralogy of Chemical Materials (3 cred.; jr., sr.; prereq., Chem., 5 cred.)	Consult	Chemistry program		Mr. Gruner
73f	Economic Geology..... (3 cred.; jr., sr.; prereq., 24)	VI	MWF	110P	Mr. Schwartz
85s	Field Work in Northern Minne- sota..... (4 cred.; jr., sr.; prereq., 2, 3, or 11*)	Ar	Ar	Ar	Mr. Gruner, Mr. Thiel
91f-92w-93s	Index Fossils of North America.. (9 cred.; jr., sr.; prereq., 2, 3, or 11*)				
	Lect.	I	F	105P	Mr. Stauffer
	Lab.	VI, VII	MW	105P	Mr. Stauffer
101f	Sedimentation..... (3 cred.; jr., sr., grad.; prereq., 23-24)	Ar	Ar	Ar	Mr. Allison

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

* "2, 3, or 11" is equivalent to the "9, 10, or 11" of the 1924-25 bulletin.

§ Does not satisfy the junior college requirement for science.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

¶ Does not count for a senior college course. Not open to sophomores under General Information, section 43 of Science, Literature, and the Arts bulletin, Part I.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
105f	Rock Study				
	(3 cred.; jr., sr., grad.; prereq., 24)				
	Lect.	VI	TTh	110P	Mr. Grout
	Sec. 1 Lab.	VII, VIII	T	200P	
	2	VII, VIII	Th	200P	
106w	Petrography	VII, VIII	MF	200P	Mr. Grout
	(3 cred.; jr., sr., grad.; prereq., 105)				
107f-108w-109s	Paleontologic Practice	Ar	Ar	105P	Mr. Stauffer
	(9 cred.; jr., sr., grad.; prereq., 91-92-93)				
111f	Ore Deposits	I	TThS	110P	Mr. Emmons
	(3 cred.; sr., grad.; prereq., 2, 3, or 11,* and 105)				
112w	Geology of Petroleum.....	I	TThS	110P	Mr. Emmons
	(3 cred.; sr., grad.; prereq., 111)				
113s	Prob. in Ore Deposits.....	VI-IX	Th	104P	Mr. Emmons
	(3 cred.; sr., grad.; prereq., 112)				
124w-125s	Struct. and Metamorphic Geol. ..	VI	MWF	200aP	Mr. Schwartz
	(6 cred.; jr., sr., grad.; prereq., 2, 3, or 11,* and 105)				
127f	Geol. of Lake Sup. Region.....	Ar	Ar	Ar	Mr. Thiel
	(3 cred.; jr., sr., grad.; prereq., 124-125)				
131f-132w-133s	Adv. Petrology				
	(9 cred.; jr., sr., grad.; prereq., 106)				
	Lect.	III	TThS	200P	Mr. Grout
	Lab.	Ar	F	200P	
137w	Testing Econ. Minerals.....				
	(3 cred.; jr., sr., grad.; prereq., 2, 3, or 11,* and 105)				
	Lect.	VI	T	200P	Mr. Grout
	Lab.	VIII, IX	MW	200P	Mr. Thiel
140w-141s	Applied Petrography				
	(6 cred.; jr., sr., grad.; prereq., 131)				
	Lect.	II	F	200P	Mr. Grout
	Lab.	I, II	MW		
144w-145s	Inter. of Geologic Maps.....	VII-IX	TTh	104P	Mr. Allison
	(6 cred.; jr., sr., grad.; prereq., 2, 3, or 11,* and 124)				
149s	Methods of Field Geology.....	Ar	Ar	Ar	Mr. Schwartz
	(1 cred.; jr., sr., grad.; to be taken with 150; prereq., 2, ‡ 23-24-25, 106, 124-125)				
150s	Field Geol. (Black Hills).....	Ar	Ar	Ar	Mr. Emmons, Mr. Schwartz
	(Cred. ar.; jr., sr., grad.; see members of department)				
151f-152w-153s	Adv. General Geology.....	III	MWF	200aP	Mr. Stauffer
	(9 cred.; jr., sr., grad.; prereq., 2, 3, or 11†)				

* "2, 3, or 11" is equivalent to the "9, 10, or 11" of the 1924-25 bulletin.

‡ Course 2 is equivalent to Course 9 of the 1924-25 bulletin.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
166w-167s	Mineralogy	Ar	Ar	103P	Mr. Schwartz
	(6 cred.; sr., grad.; prereq., 111, 131)				

GERMAN

Major Adviser: C. Schlenker

For a teacher's certificate.—Major recommendations: Courses 50-51-52, 56-57-58, 62 or 63, 64, 66, 67, 108, and nine additional credits in courses numbered above 50. Course 65 may be substituted for either Course 66 or Course 67.

Minor recommendation: Courses 50-51-52, 108, and eight additional credits in courses numbered above 50.

Credit may be earned for either Course 62 or Course 63, but not for both courses.

No.	Title	Hour	Day	Room	Instructor
1f*	Beginning A				
	(5 cred.; all; no prereq.)				
	Sec. 1	I	TWThFS	207F	Ar
	2	I	TWThFS	209F	Ar
	3	I	TWThFS	209½F	Ar
	4	I	TWThFS	321F	Ar
	5	IV	MTWFS	207F	Ar
	6	IV	MTWFS	212F	Ar
	7	IV	MTWFS	209F	Ar
	8	VI	MTWThF	207F	Ar
	9	VI	MTWThF	209F	Ar
	10	VI	MTWThF	209½F	Ar
1w*	Beginning A				
	(See 1f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VII	MTWThF	207F	Ar
1s*	Beginning A				
	(See 1f)				
	Sec. 1	II	MWThFS	212F	Ar
	2	VI	MTWThF	5F	Ar
2f*	Beginning B				
	(5 cred.; all; prereq., 1 or one yr. prep. German)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	209½F	Ar
2w*	Beginning B				
	(See 2f)				
	Sec. 1	I	TWThFS	207F	Ar
	2	I	TWThFS	209F	Ar
	3	I	TWThFS	209½F	Ar
	4	I	TWThFS	321F	Ar
	5	IV	MTWFS	207F	Ar
	6	IV	MTWFS	212F	Ar
	7	IV	MTWFS	209F	Ar
	8	VI	MTWThF	207F	Ar
	9	VI	MTWThF	209F	Ar
	10	VI	MTWThF	209½F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 5, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
25*	Beginning B (See 2f)				
	Sec. 1	II	MWThFS	209F	Ar
	2	VII	MTWThF	207F	Ar
3f	Beginning C (5 cred.; all; prereq., 2)				
	Sec. 1	III	MTThFS	209F	Ar
	2	VII	MTWThF	209F	Ar
3w	Beginning C (See 3f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	209½F	Ar
3s	Beginning C (See 3f)				
	Sec. 1	I	TWThFS	207F	Ar
	2	I	TWThFS	209F	Ar
	3	I	TWThFS	209½F	Ar
	4	I	TWThFS	321F	Ar
	5	IV	MTWFS	207F	Ar
	6	IV	MTWFS	212F	Ar
	7	IV	MTWFS	209F	Ar
	8	VI	MTWThF	207F	Ar
	9	VI	MTWThF	209F	Ar
	10	VI	MTWThF	209½F	Ar
4f	Rapid Reading (5 cred.; all; prereq., 3)				
	Sec. 1	II	MWThFS	209F	Ar
	2	III	MTThFS	212F	Ar
	3	VII	MTWThF	207F	Ar
4v	Rapid Reading (See 4f)				
	Sec. 1	III	MTThFS	209F	Ar
	2	VII	MTWThF	209F	Ar
4s	Rapid Reading (See 4f)				
	Sec. 1	II	MWThFS	207F	Ar
	2	VII	MTWThF	209½F	Ar
7f	Prose and Poetry (5 cred.; all; prereq., 2 yrs. prep. German)				
	III	III	MTThFS	207F	Ar
7w	Prose and Poetry..... (See 7f)	VII	MTWThF	212F	Ar
8w	Adv. Prose and Poetry..... (5 cred.; all; prereq., 7)	III	MTThFS	207F	Ar
8s	Adv. Prose and Poetry..... (See 8w)	VII	MTWThF	212F	Ar
15f	Narr. Prose for Pre-Medics..... (4 cred.; pre-med.; prereq., 2 yrs. prep. German)	I	MTWTh	212F	Ar
24f-25w-26s†	Begin. for Chemists..... (12 cred.; chemists, miners; no prereq.)	IV	MTWF	209½F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 5, Science, Literature, and the Arts bulletin, Part II.

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

No.	Title	Hour	Day	Room	Instructor
27f	Narr. Prose for Chemists..... (3 cred.; chemists, miners; pre-req., 26 or 2 yrs. prep. German)	II	MWF	209½F	Ar
28w-29sf	Chemical German	II	MWF	209½F	Ar
31w-32sf	Medical German				
	(6 cred.; pre-med.; prereq., 4 or 15)				
	Sec. 1	I	MWF	212F	Ar
	2	I	TThS	212F	Ar
(31s)-32f†	Medical German	I	TThS	114F	Ar
	(See 31f-32w)				
31s-(32f)†	Medical German	I	MWF	Ar	Ar
50f-51w-52sf	Composition	IV	TS	302F	Mr. Schlenker
	(6 cred.; jr., sr.; prereq., 4 or 4 yrs. prep. German)				
56f-57w†	Essay-Writing	III	MWF	217F	Mr. Kroesch
	(6 cred.; jr., sr.; prereq., 52)				
62w‡	Nineteenth-Century Prose	II	MWThFS	212F	Mr. Lussy
	(5 cred.; jr., sr.; prereq., 4 or 8, or 4 yrs. prep. German)				
62s‡	Nineteenth-Century Prose	III	MTThFS	209F	Ar
	(See 62w)				
63f‡	Modern Drama	IV	MWF	217F	Mr. Davies
	(3 cred.; jr., sr.; prereq., 4 or 8)				
64w	Classic Drama	IV	MWF	217F	Mr. Davies
	(3 cred.; jr., sr.; prereq., 62 or 63)				
65s	Survey through Reformation.....	III	TThS	209½F	Mr. Kroesch
	(3 cred.; jr., sr.; prereq., 3 cred. above 60)				
66f	Eighteenth-Century Survey	III	TThS	209½F	Mr. Burkhard
	(3 cred.; jr., sr.; prereq., 3 cred. above 60)				
67w	Nineteenth-Century Survey	III	TThS	209½F	Mr. Burkhard
	(3 cred.; jr., sr.; prereq., 3 cred. above 60)				
72	<i>Drama since 1880 (Sudermann)..</i>	<i>Not offered in 1925-26.</i>			
	(3 cred.; jr., sr.; prereq., 8 cred. above 60)				
73	<i>Drama since 1880 (Hauptmann)..</i>	<i>Not offered in 1925-26.</i>			
	(3 cred.; jr., sr.; prereq., 8 cred. above 60)				
74	<i>German Poets</i>	<i>Not offered in 1925-26.</i>			
	(3 cred.; jr., sr.; prereq., 62 or 63 or 64)				
77s	Faust I	IV	MWF	302F	Mr. Schlenker
	(3 cred.; jr., sr.; prereq., 6 cred. above 60)				

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

‡ Students may not receive credit for both 62 and 63.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
100f-101w-102s†	Middle High German..... (9 cred.; sr., grad.; prereq., 65 and 11 cred. above 60)	VII, VIII	WF	302F	Mr. Kroesch
108s	Phonetics (3 cred.; sr., grad.; prereq., 9 senior college cred. in mod. lang.)	III	MWF	217F	Mr. Kroesch
109f-110w-111s†	Hist. of German Language..... (9 cred.; sr., grad.; prereq., see statement under Comp. Phil.)	Ar	Ar	Ar	Mr. Klaeber
115f-116w-117s†	Middle High German Literature.. (9 cred.; sr., grad.; prereq., 65 and 11 credits above 60)	Ar	Ar	Ar	Mr. Kroesch
140f-141w-142s†	Early New High German Litera- ture, 1500-1700 (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	Ar	Ar	Ar	Mr. Lussky
150-151-152†	Novelle (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	<i>Not offered in 1925-26.</i>			
153f-154w-155s†	Studies in German Literature of the Nineteenth Century—Aus- trian Drama (9 cred.; sr., grad.; prereq., 67 and 11 cred. above 60)	VII, VIII, IX	T	301Lib	Mr. Burkhard
160-161-162	Lytic Poetry (9 cred.; sr., grad.; prereq., 66 or 67 and 11 cred. above 60)	<i>Not offered in 1925-26.</i>			
163f-164w-165s†	German and English Literary Re- lations, 16th, 17th, 18th cen- turies (9 cred.; sr., grad.; prereq., 65 or 67 and 11 cred. above 60)	Ar	Ar	Ar	Mr. Davies
225f-226w-227s†	Lit. Problems (Schiller)..... (9 cred.; grad., sr. with com- pleted major sequence)	VII, VIII, IX	Th	301Lib	Mr. Schlenker

GREEK

Major Adviser: Charles A. Savage

No.	Title	Hour	Day	Room	Instructor
1f-2w†-3s	Beginning Greek (15 cred.; all; no prereq.)	IV	MTWFS	114F	Mr. Savage, Miss Strong
14f	History: Xenophon (3 cred.; all; prereq., 1-2-3)	III	TThS	114F	Miss Strong
15w	History: Herodotus (3 cred.; all; prereq., 1-2-3)	III	TThS	114F	Mr. Savage
16s	Epic Poetry: Homer..... (3 cred.; all; prereq., 14 or 15)	III	TThS	114F	Miss Strong
17f,w,s	Greek Sources (Everyday Greek) (2 cred.; soph., jr., sr.; prereq., 1 yr. of any foreign language)	VIII	TTh	114F	Mr. Savage

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

No.	Title	Hour	Day	Room	Instructor
51f	Philosophy (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Mr. Savage
52w	Oratory (3 cred.; jr., sr.; prereq., any two of 14, 15, and 16)	Ar	Ar	112F	Mr. Savage
53s	Dramatic Poetry (3 cred.; jr., sr.; prereq., 51 or 52)	Ar	Ar	112F	Mr. Savage
103f	Lyric Poetry (3 cred.; sr., grad.; prereq., 53)	Ar	Ar	112F	Mr. Savage
106w*	Advanced Drama (3 cred.; sr., grad.; prereq., 53 or 105)	Ar	Ar	112F	Mr. Savage
107w*	Advanced Prose (3 cred.; sr., grad.; prereq., 51-52, or 51-53, or 52-53)	Ar	Ar	112F	Mr. Savage
108s§	Advanced Epic Poetry..... (3 cred.; sr., grad.; prereq., 105 or 106)	Ar	Ar	112F	Mr. Savage
109s§	New Testament (3 cred.; jr., sr., grad.; prereq., 51 and 52)	Ar	Ar	112F	Mr. Savage

Courses for Which No Knowledge of Greek Is Required

42s¶	Greek Sculpture (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
43f¶‡	Greek Drama (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
44w¶‡	Greek Literature and Life..... (2 cred.; jr., sr.; no prereq.)	VII	TTh	114F	Mr. Savage
44s¶‡	Greek Literature and Life..... (See 44w)	I	WF	114F	Mr. Savage
45f¶	Greek Mythology (2 cred.; jr., sr.; no prereq.)	I	WF	114F	Mr. Savage
45w¶	Greek Mythology (See 45f)	I	WF	114F	Mr. Savage

HISTORY

Major Adviser: A. C. Krey

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: at least 45 credit hours; at least 15 credits must be in senior college courses, and of these one course (5 credits) must be numbered from 151 to 200.

Minor recommendation: a minor recommendation will be given upon the completion of at least 18 credit hours with a satisfactory grade.

No major recommendation to teach history will be given unless the candidate has taken at least the general course in American history, History 7-8.

* Courses 106 and 107 are offered alternately.

‡ Students may not take for credit both Courses 43, 44 without special permission.

§ Courses 108 and 109 are offered alternately.

¶ Not a senior college course. Not open to sophomores under General Information, section 43 of Science, Literature, and the Arts bulletin, Part I.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
1f*	Modern World, 1648-1795..... (5 cred.; all; no prereq.)	Lect. II	TThS	OLAud	Mr. Ford, Mr. Harding
	Sec. 1	I	MW	311½F	
	2	I	MW	316F	
	3	I	MW	305F	
	4	I	MW	306F	
	5	I	MW	107F	
	6	II	MW	109F	
	7	II	MW	303F	
	8	II	MW	305F	
	9	II	MW	213F	
	10	II	MW	101F	
	11	II	MW	111OL	
	12	III	MW	114F	
	13	III	MW	Ar	
	14	III	MW	227F	
	15	V	MW	111OL	
	16	V	MW	112OL	
	17	VII	MW	112OL	
	18	VII	MW	221OL	
	19	VIII	MW	107F	
	20	VIII	MW	112OL	
2w*	Modern World, 1795-1871..... (5 cred.; all; no prereq.)	Lect. II	TThS	OLAud	Mr. Ford, Mr. Harding
	Sections as in 1f				
3s	Modern World, 1871 to Present.. (5 cred.; all; prereq., 2)	Lect. II	TThS	OLAud	Mr. Ford, Mr. Harding
	Sections as in 1f				
4f-5w†	England 1066 to Present..... (10 cred.; all; no prereq.)	Lect. VII	MWF	OLAud	Mr. White
	Sec. 1	I	TTh	111OL	
	2	III	TTh	221OL	
	3	IV	TS	111OL	
	4	VI	TTh	221OL	
	5	VII	TTh	111OL	
	6	VII	TTh	112OL	
4s-(5w)†	England, 1066 to Present.....	III	MTThFS	211OL	Mr. White
7f-8w†	American History (10 cred.; soph., jr., sr.; no prereq.)	Lect. I	TThS	OLAud	Mr. Stephenson, Mr. Shippee
	Sec. 1	I	MW	209OL	
	2	I	MW	303F	
	3	III	MW	211OL	
	4	VII	MW	211OL	
	5	VIII	MW	211OL	

* To receive credit for Course 1, a student must complete both 1 and 2. To receive credit for Course 2, a student must complete either 1 and 2 or 2 and 3.

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
9s	Recent American History (5 cred.; soph., jr., sr.; prereq., 10 cred. in hist. or pol. sci.)	Lect. I	TThS	OLAud	Mr. Shippee
	Sections as in 7-8				
11f-12w-13s†	Medieval History (10 cred.; 3rd qtr. fr., soph., jr., sr.; prereq., 10 cred. except for mus. and int. dec.)	IV	MWF (fall, winter) MWF and ar (spring)	221OL	
16s	Europe in the Middle Ages..... (5 cred.; all; prereq., 10 cred. in hist. if taken by fr.)	II	MWThFS	221OL	Mr. Krey
33s	English Legal Institutions..... (5 cred.; soph., jr., sr.; prereq., Hist. 4-5)	II	MWThFS	112OL	Mr. White
8o	<i>Introduction to Economic History</i> (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ. or sociol.)	<i>Not offered in 1925-26.</i>			
81	<i>Introduction to Economic History</i> (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ. or sociol.)	<i>Not offered in 1925-26.</i>			
82f	Economic History of the United States: Colonial Period..... (3 cred.; jr., sr.; prereq., 15 cred. in hist. or 10 cred. in econ. or sociol.)	III	TThS	218aOL	Mr. Gras
83w	Economic History of the United States: Early National Period.. (See 82)	III	TThS	218aOL	Mr. Gras
84s	Economic History of the United States since 1860..... (See 82)	III	TThS	218aOL	Mr. Gras
101f-102w	French Revolution: Napoleonic Era (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.)	I	TThS	112OL	Mr. Harding
103f	Pol. Hist.: Greece (5 cred.; jr., sr., grad.; prereq., 20 cred. or major in Greek or Latin)	III	MTThFS	104OL	Mr. Cram
104s	Near East: Modern (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	III	MTThFS	104OL	Mr. Steefel
105w	History of Rome..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	III	MTThFS	104OL	Mr. Cram

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
106f-107w-108s§	Europe, 1815-1914 (9 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Hist. 1-2 or 2-3)	VII	MWF	111OL	Mr. Steefel
109S	Modern England (5 cred., jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	IV	MTWFS	111OL	Mr. Harding
111W	European Background of Amer- ican Immigration (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	MTWF	111OL	Mr. Stephenson
112S	American Immigration (4 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)	VI	MTWF	111OL	Mr. Stephenson
113-114-115	<i>Econ. Hist. of Europe since 1750</i> (9 cred.; jr., sr., grad.; prereq., 20 cred. in hist., econ., or both)	<i>Not offered in 1925-26.</i>			
116f-117w-118S	Econ. Hist. of Europe, 1300-1750 (9 cred.; jr., sr., grad.; prereq., 20 cred. in hist., econ., or both)	II	TThS	111OL	Mr. Gras
119S	Renaissance and Reformation.... (5 cred., jr., sr., grad.; prereq., 15 cred.)	IV	MTWFS	112OL	Mr. Krey
120f	Medieval Civilization (5 cred., jr., sr., grad.; prereq., 15 cred.)	IV	MTWFS	112OL	Mr. Krey
121W	English Backgrounds and Ameri- can Colonization (5 cred., jr., sr., grad.; prereq., 20 cred. in hist. or pol. sci.)	II	MWThFS	112OL	Mr. White
124	<i>European Expansion</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in hist. incl. 1-2, or 106-107-108)	<i>Not offered in 1925-26.</i>			
125f-126w†	American Diplomatic History.... (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 in hist. or pol. sci.)	III	MWF	221OL	Mr. Shippee
127	<i>Feudal Institutions</i> (5 cred.; jr., sr., grad.; prereq., 15 cred.)	<i>Not offered in 1925-26.</i>			
128W	Rise of Nationalism in Europe... (5 cred.; jr., sr., grad.; prereq., 15 cred.)	IV	MTWFS	112OL	Mr. Krey
129-130†	<i>Modern German Empire</i> (6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 cred. in soc. sci. incl. 10 cred. in hist.)	<i>Not offered in 1925-26.</i>			

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

§ With the permission of the instructor, a student may enter the second or third quarter.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
131-132	<i>France under Louis XIV and Louis XV</i>				<i>Not offered in 1925-26.</i>
	(6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 20 in soc. sci. incl. 10 in hist.)				
133	<i>Near East: Old Orient</i>				<i>Not offered in 1925-26.</i>
	(3 cred., jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist.)				
134	<i>Ancient Civilization: Greece</i>				<i>Not offered in 1925-26.</i>
	(3 cred., jr., sr., grad.; prereq., 20 cred. incl. 103 or equiv., or major in Greek or Latin and consent of instr.)				
135	<i>Ancient Civilization: Rome</i>				<i>Not offered in 1925-26.</i>
	(3 cred., jr., sr., grad.; prereq., 134 or consent of instructor; 20 cred. incl. 105 or equiv., or major in Greek or Latin and consent of instr.)				
136-137	<i>Far Eastern Government and Politics</i>				<i>Not offered in 1925-26.</i>
138f-139w†	Far Eastern Diplomacy.....				See Political Science program
141f	West in Amer. Hist. to 1815....	II	TThS	218BOL	Mr. Buck
	(3 cred., jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 7-8)				
142w	West in Amer. Hist., 1815-1865	II	TThS	218BOL	Mr. Shippee
	(3 cred., jr., sr., grad.; prereq., see 141)				
143w	American Political Parties.....	II	MWF	221OL	Mr. Stephenson
	(3 cred., jr., sr., grad.; prereq., 20 cred. in soc. sci. or 15 cred. in hist. incl. 7-8 or equiv.)				
144-145†	<i>History of Minnesota</i>				<i>Not offered in 1925-26.</i>
	(6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 7-8 or consent of instr.)				
146f-147w†	Constitutional Hist. of U. S.	IV	MWF	111OL	Mr. Shippee
	(6 cred.; jr., sr., grad.; prereq., 15 cred. in hist. or 10 cred. in hist. and 10 in soc. sci. incl. Pol. Sci. 1)				
148f-149w†	English Colonies in America.....	I	MWF	112OL	Mr. Harding
	(6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 in hist., or 15 cred. in hist.)				
152w	Select Topics, West to 1815.....	VIII, IX	TTh	328Lib	Mr. Buck
	(5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8 or equiv.)				
153s	Topics, West since 1865.....	VIII, IX	TTh	328Lib	Mr. Buck
	(5 cred.; sr., grad.; prereq., 20 cred., incl. 7-8)				

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
154	Topics, Minnesota (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	Not offered in 1925-26.			
155f	United States, 1850-1865 (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	VIII, IX	WF	328Lib	Mr. Shippee
156	U. S., Reconstruction (5 cred.; sr., grad.; prereq., 20 cred. incl. 7-8)	Not offered in 1925-26.			
157f-158w†*	Topics, Nineteenth Century (10 cred.; sr., grad.; prereq., 20 cred. incl. 107-108, 101-102, or 129-130; equiv. of Hist. 2-3 and French or German)	VII, VIII	TTh	110Lib	Mr. Steefel
162f	Beginnings of Parliament (5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin)	VIII, IX	TTh	328Lib	Mr. White
164w	Studies in Crusades (5 cred.; sr., grad.; prereq., 20 cred., knowledge high school Latin)	VIII, IX	TTh	Ar	Mr. Krey
166f	Topics, Hist. of Immigration (5 cred.; sr., grad.; prereq., 20 cred., consent of instr.)	VIII, IX	TTh	Ar	Mr. Stephenson
168	Topics, American Foreign Relations (3 cred.; sr., grad.; prereq., 20 cred. in hist. incl. 7-8, or 20 cred. in pol. sci.)	Not offered in 1925-26.			
169	Econ. Hist. of U. S. since 1865 (3 cred.; sr., grad.; prereq., 20 cred. in hist. or econ.)	Not offered in 1925-26.			
183s	Stuart Period (5 cred.; sr., grad.; prereq., 20 cred. incl. 4-5)	VIII, IX	MW	328Lib	Mr. Wilson

HOME ECONOMICS

COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

NOTE.—Only courses with 15 credits prerequisite will count as senior college courses

Junior College Courses

No.	Title	Hour	Day	Room	Instructor
3s	Textiles (5 cred.; all; no prereq.) (Limited to 20)	I, II	MTWThF	211,307HE	Miss Weller, Miss Phelps
4f,s	Textiles (Ed., S. L. & A.) (3 cred.; not open to students in H. E.; no prereq.) (Limited to 20)	VI, VII	MWF	211,307HE	Miss Phelps, Miss Noer

* Each term may be taken separately with the permission of the instructor.

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
11f,s	Garment-Making				
	(3 cred.; all; no prereq.)				
	Sec. 1	I, II	MWF	304HE	Miss Noer, Miss Sell
	(Limited to 24 each) 2	I, II	TThS	304HE	Miss Noer, Miss Sell
	3	VI, VII, VIII	TTh	304HE	Miss Noer, Miss Sell
11w	Garment-Making				
	(See 11f)				
	Sec. 1	I, II	TThS	304HE	Ar
	2	VI, VII, VIII	TTh	304HE	Ar
13f,s	Dressmaking	I, II	MTWThF	305HE(f)	Ar
	(5 cred.; all; prereq., 3, 11, 50 home pract. in garment-making) (Limited to 20 students)			114HE(s)	Ar
21f,s	Foods and Cookery.....	I, II	MTWThF	209HE	Miss Kolshorn
	(5 cred.; soph., jr., sr.; prereq., Agric. Biochem. 3, 4*)				
21w	Foods and Cookery.....				
	(See 21f,s)				
	Sec. 1	VI, VII	MTWThF	209HE	Miss Kolshorn
	(Limited to 20 each) 2	I, II	MTWThF	209HE	Miss Kolshorn
22f	Food Economics	III, IV	MTWFS	203,207HE	Miss Child, Miss Kolshorn
	(5 cred.; soph., jr., sr.; prereq., 21)				
22w,s	Food Economics				
	(See 22f)				
	Sec. 1	III, IV	MTWFS	205,207HE	Miss Child, Miss Kolshorn
	(Limited to 20 each) 2	VI, VII	MTWThF	205,207HE	Miss Child, Miss Kolshorn
50f	Color and Design I.....				
	(3 cred.; no prereq.)				
	Sec. 1	I-II	MWF	402HE	Miss V. Goldstein
	2	I-II	TThS	112HE	Miss L. Stoddard
50w	Color and Design I.....				
	(See 50f)				
	Sec. 1	I-II	MWF	112HE	Miss H. Goldstein
	2	VI-VII-VIII	TTh	401HE	Miss L. Stoddard
50s	Color and Design I.....				
	(See 50f)				
	Sec. 1	I-II	TThS	402HE	Miss H. Goldstein
	2	I-II	TThS	112HE	Miss L. Stoddard
52f	Art History and Appreciation....				
	(3 cred.; 3d qtr. soph., jr., sr.; prereq., 50f)				
	Sec. 1	VIII	MWF	313HE	Miss H. Goldstein
	2	III	TThS	313HE	Miss V. Goldstein
52w	Art History and Appreciation....	VIII	MWF	313HE	Miss H. Goldstein
	(See 52f)				
52s	Art History and Appreciation....				
	(See 52f)				
	Sec. 1	II	MWF	313HE	Miss V. Goldstein
	2	VII	MWF	313HE	Miss V. Goldstein

* Course 21 may be taken parallel with 4.

PROGRAM

No.	Title	Hour	Day	Room	Instructor	
53f	Advanced Design (3 cred.; soph., jr., sr.; prereq., 50 or 56)	Sec. 1 2	III, IV VI, VII	MWF MWF	402HE 402HE	Miss H. Goldstein Miss H. Goldstein
53w	Advanced Design (See 53f) (Limited to 20)		VI, VII	MWF	402HE	Miss H. Goldstein
53s	Advanced Design (See 53f)	Sec. 1 2	III, IV VI, VII	MWF MWF	402HE 402HE	Miss H. Goldstein Miss H. Goldstein
56f	Application of Color and Design.. (3 cred.; no prereq.)		VI, VII, VIII	TTh	402HE	Miss V. Goldstein
70f	Food Preparation (3 cred.; †; prereq., 10 cred. in a laboratory science) (Limited to 20)		VI, VII	MWF	103HE	Miss Osbeck
<i>Senior College Courses</i>						
17f,w	Advanced Clothing Construction.. (3 cred.; jr., sr.; prereq., 13, 53) (Limited to 24)		III, IV	MWF	305HE	Miss C. Brown
17s	Advanced Clothing Construction.. (See 17f,w)	Sec. 1 2	III, IV I, II	MWF TThS	305HE 305HE	Ar Ar
71w	Elementary Dietetics (3 cred.; jr., sr.†; prereq., 70)		VI, VII	MWF	105HE	Miss Osbeck
72s	Special Problems in Home Man- agement (3 cred.; jr., sr.†; prereq., H.E. 71, Econ. 6-7 prereq. or par- allel)		VI	MWF	106HE	Miss Osbeck
123f,w	Clothing Economics (2 cred.; jr., sr.; prereq., 13, Econ. 6-7)		III	TS	313HE	Miss Weller
131f	Home Management: House Plan- ning and Equipment..... (5 cred.; sr.; prereq., 52, 53) (Limited to 20)		III, IV	MTWFS	401HE	Miss Morse
131w	Home Management: House Plan- ning and Equipment..... (See 131f)	Sec. 1 2	III, IV VI, VII	MTWFS MTWThF	401HE 401HE	Miss Morse Miss Morse
131s	Home Management: House Plan- ning and Equipment..... (See 131f)		I, II	MTWThF	401HE	Miss Morse

† Open to sophomores only in their third quarter. Not open to students in Home Economics except by special permission of the chief of the division.

HUMAN ANATOMY

MEDICAL SCHOOL

For Course 2, Elementary Anatomy, primarily for nurses, see Nursing School program.

Students in this college may elect other courses in human anatomy (see Medical School program) only by arrangement with the head of the Department of Anatomy.

HUMAN PHYSIOLOGY

MEDICAL SCHOOL

Major Advisers: J. F. McClendon, F. H. Scott

No.	Title	Hour	Day	Room	Instructor
4f,w,s,su	Human Physiology				
	(5 cred.; all; prereq., 1 qtr. biol., 1 qtr. chem.)				
	Lect. IV MWF 315MH Dr. Lyon, Dem. and rec. III TTh Dr. Greis- Lab. II, III, IV S heimer, and others				
57f	Physiol. Chemistry				
	(4 cred.; jr., sr.; prereq., An. Biol. 1-2 or 5-6-7; Chem. 1-2-3 or 4-5)				
	Div. A Lab. I TThS 310MH Mr. Pettibone B Lab. II, III, IV T and others VI, VII, VIII W				
58w,su-59s,su	Human Physiology				
	(8 cred.; jr., sr.; prereq., An. Biol. 1-2 or 5-6-7; Chem. 1-2-3 or 4-5)				
	Div. A Lab. I TThS 301MH Dr. Lyon B Lab. II, III, IV T and others VI, VII, VIII W				
100W-101S-100SU- 101SU*	Physiol. Chemistry				
	(12 cred.; jr., sr.; prereq., biol., org. chem., and physics)				
	Div. A Lab. I, II, III TTh B Lab. I, II, III FS IV MTWF 301MH Dr. Lyon, VI-IX MWF Mr. Scott, and others				
103f,su*	Physiology of Muscles, etc.	IV	MTWF	301MH	Dr. Lyon, Mr. Scott, and others
104W,su*	Physiol. of Nervous System, etc.	IV	MWF	301MH	Dr. Lyon, Mr. Scott, and others
	(7 cred.; jr., sr.; prereq., an. biol. and org. chem.)	VI-VIII	MF		

For other courses see Medical School bulletin and programs

* Students may register for lectures without laboratory.

JOURNALISM

The program of courses in Journalism for the year 1925-26 will be published later.

LATIN

REQUIREMENTS OF THE DEPARTMENT

Major Adviser: J. B. Pike

For a teacher's certificate.—Major recommendation: Course 73, any two of Courses 71, 52, 53 and three courses in the hundred sequence.

Minor recommendation: Course 73 and any two of Courses 71, 52, and 53.

Junior College Courses

No.	Title	Hour	Day	Room	Instructor
1f-2w†§	Beginning Latin				
	(10 cred.; all; no prereq.)				
	Sec. 1	IV	MTWFS	109F	Mrs. Babcock
	2	VI	MTWThF	109F	Mr. Cram
35	Caesar				
	(5 cred.; all; prereq., 1-2 or 1 yr. Latin)				
	Sec. 1	IV	MTWFS	109F	Mrs. Babcock
	2	VI	MTWThF	109F	Mr. Cram
11f	Virgil I and II.....				
	(5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)				
	Sec. 1	III	MTThFS	109F	Mrs. Babcock
	2	VI	MTWThF	107F	Mrs. Babcock
12w	Virgil III and IV.....				
	(5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)				
	Sec. 1	III	MTThFS	109F	Mrs. Babcock
	2	VI	MTWThF	107F	Mrs. Babcock
13s	Ovid	III	MTThFS	109F	Mrs. Babcock
	(5 cred.; all; prereq., 1-2, 3, or 2 yrs. Latin)				
21f	Selections	IV	MTWFS	107F	Mr. Pike
	(5 cred.; all; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)				
22w	Selections and Survey.....	IV	MTWFS	107F	Mr. Pike
	(5 cred.; all; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)				
23s	Plautus and Terence.....	IV	MTWFS	107F	Mr. Pike
	(5 cred.; all; prereq., any two of 11, 12, 13, or 3 or 4 yrs. of Latin)				

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

§ Credit is usually not given for more than one beginning language. See paragraph 2, page 5 of Science, Literature, and the Arts bulletin, Part II.

Senior College Courses

No.	Title	Hour	Day	Room	Instructor
51f	Pliny's Letters (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	108F	Mr. Cram
52w	Horace's Satires and Epistles.... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	108F	Mr. Cram
53s	Suetonius, Selected Lives..... (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)	I	TThS	108F	Mr. Cram
71	Cicero's <i>De Amicitia</i> and <i>De Senectute</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)				<i>Not offered in 1925-26.</i>
62	Horace's <i>Odes</i> and <i>Epodes</i> (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)				<i>Not offered in 1925-26.</i>
63	Apuleius (3 cred.; jr., sr.; prereq., any two of 21, 22, 23, or equiv.)				<i>Not offered in 1925-26.</i>
73s	Advanced Grammar and Composition* (3 cred.; jr., sr.; prereq., 51 and 52, or 71 and 62)	III	MWF	Ar	Ar
121f	Advanced Virgil (3 cred.; jr., sr., grad.; prereq., any one of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
122	Cicero's <i>Letters</i> (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)				<i>Not offered in 1925-26.</i>
123	Medieval Latin (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)				<i>Not offered in 1925-26.</i>
131	Juvenal (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)				<i>Not offered in 1925-26.</i>
132w	Seneca's Epistles (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
133s	Vulgar Latin (3 cred.; jr., sr., grad.; prereq., any two of 51, 52, 53, or equiv.)	II	MWF	107F	Mr. Pike
201-202-203	Grad. Seminar: Tacitus..... (9 cred.)				<i>Not offered in 1925-26.</i>

Students entering winter quarter.—Students with one year of Latin may elect 2w. Students with two years of Latin may elect 12w. Students with three or four years of Latin may elect 22w.

Students entering spring quarter.—Students with one year of Latin may elect 3s. Students with two years of Latin may elect 13s. Students with three or four years of Latin may elect 23s.

* Required of students who expect a teaching recommendation.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
211f-212w-213s	Grad. Seminar: Lucretius..... (9 cred.)	Ar	Ar	Ar	Mr. Pike
221f-222w-223s	Graduate Seminar (9 cred.)	Ar	Ar	Ar	Mr. Cram

Courses for Which No Knowledge of Latin Is Required

43s†	Roman Literature (3 cred.; jr., sr.‡; no prereq.)	II	MWF	Ar	Mr. Cram
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LIBRARY METHODS

No.	Title	Hour	Day	Room	Instructor
1f,w,s	Use of Books and Libraries..... (2 cred.; fr., soph. only; no pre-req.)				
	Sec. 1	II	MW	5Lib	Miss Pirkins
	2	IV	MW	5Lib	Mr. Russell
	3	VI	MW	5Lib	Mr. Walter
101f-102w	Bibliographic Seminar (4 cred.; sr., grad.; prereq., foreign language†)	II	TTh	5Lib	Mr. Walter

MATHEMATICS

Major Adviser: A. L. Underhill

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: 8 credits in addition to the courses required for a minor recommendation.

Minor recommendation: entrance credit in solid geometry or its equivalent;* Course 1 (Higher Algebra) taken either in high school or in college; Courses 6, 7, 30, 50, 51.

Junior College Courses

No.	Title	Hour	Day	Room	Instructor
3f	Higher Algebra (pre-med. students only) (4 cred.; pre-med. only; prereq., 1 yr. elem. alg.)	VII	MTThF	105F	Ar
3w	Higher Algebra (pre-med. students only) (See 3f)	VII	MTThF	104F	Ar
4f	Algebra and Trigonometry (pre-med. students only)..... (4 cred.; pre-med. only; prereq., 3 or 5, or prep. higher alg.)	VIII	MTThF	105F	Ar
4w	Algebra and Trigonometry (pre-med. students only)..... (See 4f)	VII	MTThF	105F	Ar

NOTE.—For courses in hospital library service, consult special bulletin.

‡ Not a senior college course. Not open to sophomores under General Information, sec. 43, Science, Literature, and the Arts bulletin, Part I.

† Enough of one foreign language to meet the Group B requirement for admission to the Senior College, and 9 credits additional in the same or another foreign language.

* Those who did not present solid geometry for entrance may meet this requirement in one of the following ways: (1) By taking the subject in the summer school or in the General Extension Division by correspondence; (2) By passing a college entrance examination or a special examination given by the Department of Mathematics.

No.	Title	Hour	Day	Room	Instructor	
4s	Algebra and Trigonometry (pre-med. students only)..... (See 4f)	VII	MTThF	104F	Ar	
5f	Higher Algebra (5 cred.; all; prereq., 1 yr. elem. alg.)	Sec. 1 2	II VI	MWThFS MTWThF	105F 104F	Ar Ar
5w	Higher Algebra (See 5f)	Sec. 1 2	I VI	TWThFS MTWThF	104F 105F	Ar Ar
5s	Higher Algebra (See 5f)	I	TWThFS	102F	Ar	
6f¶	Trigonometry (5 cred.; all; prereq., 5 or prep. higher algebra)	IV	MTWFS	104F	Ar	
6w¶	Trigonometry (See 6f)	VI	MTWThF	104F	Ar	
6s¶	Trigonometry (See 6f)	I	TWThFS	104F	Ar	
7f¶	College Algebra (5 cred.; all; prereq., 6)	IV	MTWFS	105F	Ar	
7w¶	College Algebra (See 7f)	IV	MTWFS	104F	Ar	
7s¶	College Algebra (See 7f)	VI	MTWThF	104F	Ar	
8f¶	Commerce Algebra (5 cred.; pre-bus. students; prereq., 5 or prep. high. alg.)	I	TWThFS	104F	Ar	
8w¶	Commerce Algebra (See 8f)	II	MWThFS	105F	Ar	
8s¶	Commerce Algebra (See 8f)	VI	MTWThF	105F	Ar	
20f	Mathematics of Investment..... (5 cred.; all; prereq., 8, or 6 and 7)	VI	MTWThF	105F	Mr. Hart	
20w	Mathematics of Investment..... (See 20f)	I	TWThFS	105F	Mr. Hart	
20s	Mathematics of Investment..... (See 20f)	II	MWThFS	105F	Mr. Hart	
30f	Analytical Geometry (5 cred.; all; prereq., 6 and 7)	III	MTThFS	104F	Miss Gibbens	
30w	Analytical Geometry (See 30f)	IV	MTWFS	105F	Mr. Brink	
30s	Analytical Geometry (See 30f)	IV	MTWFS	104F	Mr. Underhill	

¶ Courses 6 and 8 involve some duplication of material, and no student may take both without special permission. No student may receive credit for both Courses 7 and 8. Pre-business students who elect mathematics to meet the requirement of 10 credits in mathematics or laboratory science, should take 5 and 8 if they have not had high school higher algebra, and 8 and 20 if they have had high school higher algebra.

Senior College Courses

50f§	Calculus I	III	MTThFS	101F	Mr. Jackson
	(5 cred.; jr., sr.; prereq., 30)				
50w§	Calculus I	III	MTThFS	104F	Miss Gibbens
	(See 50f)				
50s§	Calculus I	IV	MTWFS	105F	Mr. Brink
	(See 50f)				
51w§	Calculus II	III	MTThFS	101F	Mr. Jackson
	(5 cred.; jr., sr.; prereq., 50)				
51s§	Calculus II	III	MTThFS	104F	Miss Gibbens
	(See 51w)				
52f§	Calculus III	Ar	Ar	Ar	Mr. Underhill
	(5 cred.; jr., sr.; prereq., 51)				
52s§	Calculus III	III	MTThFS	101F	Mr. Jackson
	(See 52f)				
60	Synthetic Metric Geometry	Not offered in 1925-26.			
	(3 cred.; jr., sr.; prereq., 50)				
62w-63s	Theory of Equations	VII	MWF	101F	Mr. Hart
	(6 cred.; jr., sr.; prereq., 50)				
70s	Hist of Elem. Math.	I	MWF	108F	Mr. Bussey
	(3 cred.; jr., sr.; prereq., 30)				
71f	Solid Analytical Geometry	VII	MWF	101F	Mr. Hart
	(3 cred.; jr., sr.; prereq., 50)				
102f-103w-104s*	Adv. Analytical and Synthetic Geometry	Ar	Ar	Ar	Miss Gibbens
	(9 cred.; jr., sr., grad.; prereq., 50)				
106f	Differential Equations	III	MWF	108F	Mr. Brink
	(3 cred.; jr., sr., grad.; prereq., 51)				
107w-108s	Advanced Calculus	III	MWF	108F	Mr. Brink
	(6 cred.; jr., sr., grad.; prereq., 52)				
115f-116w-117s*	Differential Geometry	Ar	Ar	Ar	Mr. Underhill
	(9 cred.; jr., sr., grad.; prereq., 50-51)				
118f-119w-120s	Vector Analysis	Ar	Ar	Ar	Mr. Jackson
	(9 cred.; jr., sr., grad.; prereq., 50-51)				
121-122-123	Math. Theory of Statistics	Not offered in 1925-26.			
	(9 cred.; jr., sr., grad.; prereq., 50-51)				
140w‡	Method of Least Squares	See Astronomy program.			
	(3 cred.; jr., sr., grad.; prereq., Math. 51)				

NOTE.—Some of the courses listed in the Graduate School bulletin are open to properly qualified juniors and seniors. For more information consult the chairman of the Department of Mathematics.

* One of the two courses 102-103-104, 115-116-117 will be given in 1925-26.

‡ Identical with Astronomy 140.

§ Courses 50, 51, and 52 are open without petition to sophomores who have the prerequisites and who satisfy the requirements given in General Information, sec. 43, Science, Literature, and the Arts bulletin, Part I.

COLLEGE OF EDUCATION

MECHANICAL ENGINEERING

COLLEGE OF ENGINEERING AND ARCHITECTURE

No.	Title	Hour	Day	Room	Instructor
11S	Elem. Shop Practice (Pattern Shop) (2 cred.; § pre-dent. only; no prereq.)	VII, VIII, IX	MW	ME	Mr. Shipley and others
12W	Elem. Shop Practice (Foundry) (2 cred.; § pre-dent. only; no prereq.)	VII, VIII, IX*	MW*	ME	Mr. Shipley and others
13f	Elem. Shop Practice (Forge).... (2 cred.; § pre-dent. only; no prereq.)	VII, VIII, IX*	MF*	ME	Mr. Shipley and others

MILITARY SCIENCE AND TACTICS

No.	Title	Hour	Day	Bldg.	Instructor
1f-2W	First Year Basic Course..... (No cred.; fr.; no prereq.)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
3S	First Year Basic Course..... (No cred.; fr.; prereq., 1-2)	VII, VIII, IX	T or W	A	Ar
4f-5W	Second Year Basic Course..... (No cred.; soph.; prereq., 1-2, 3)				
	Sec. 1	II	MWF	A	Ar
	2	III	MWF	A	Ar
	3	VI	MWF	A	Ar
	4	VIII	MWF	A	Ar
6S	Second Year Basic Course..... (No cred.; soph.; prereq., 4-5)	VII, VIII, IX	T or W	A	Ar
51f-52W	First Year Advanced Course.... (Total of five hours selected from the following) (Cred.; † jr.; prereq., 4-5, 6)	II III VI VIII I, II III, IV VI, VII VIII, IX	MWF MWF MWF MWF TThS TS TTh TTh	A A A A A A A A	Ar Ar Ar Ar Ar Ar Ar Ar
53S	First Year Advanced Course.... (Cred.;* jr.; prereq., 51-52)	VII, VIII, IX IV	T or W TS	A A	Ar Ar
54f-55W	Second Year Advanced Course... (Total of five hours selected from the following) (Cred.;* sr.; prereq., 51-52, 53)	II III VI VIII I, II III, IV VI, VII VIII, IX	MWF MWF MWF MWF TThS TS TTh TTh	A A A A A A A A	Ar Ar Ar Ar Ar Ar Ar Ar
56S	Second Year Advanced Course.. (Cred.;* sr.; prereq., 54-55)	VII, VIII, IX IV	T or W TS	A A	Ar Ar

* Other hours and days are available for students who have program conflicts. Students interested should consult Professor Shipley in the College of Engineering.

§ Does not carry credit except for pre-dental students.

† For the amount of credit given for the work of the Advanced R.O.T.C., see page 12, Science, Literature, and the Arts bulletin, Part II.

MUSIC

NOTE.—Courses in music are not open to freshmen and sophomores except those working for a major in music. But under certain conditions, freshmen and sophomores are allowed to take practical music in the General Extension Division. See General Regulations, sec. 5, Science, Literature, and the Arts bulletin, Part I.

Students may enter courses in practical music any quarter.

To secure the degree of bachelor of arts with a major in music, a student must fulfill the requirements of both the Junior and Senior Colleges (pp. 5 to 7, S. L. A. bul.) securing 144 credits in courses other than practical music (piano, voice, etc.). During the first two years he will register for English A-B-C, foreign language, History 11-12-13, and Psychology 1-2 and 4-5 or 7, and the following courses in music: 1-2-3, 4-5-6, 7-8-9. He will take practical music under the direction of an adviser during the entire course. §

Major Advisers: D. N. Ferguson, E. C. Killeen, and C. M. Scott

No.	Title	Hour	Day	Room	Instructor
1f-2w-3s†	Harmony				
	(9 cred.; fr. mu.; no prereq.)				
	Sec. 1	II	MWF	Mu	Mr. Scott
		VI	MWF	Mu	Mr. Scott
1w-2s-(3su)†	Harmony	III	MWF	Mu	Miss Reeves
	(See 1f-2w-3s)				
4f-5w-6s†	Counterpoint	III	TTh	Mu	Mr. Ferguson
	(6 cred.; soph. mu.; prereq., 1-2-3)				
7f-8w-9s	Ear-Training	VI	TTh	Mu	Ar
	(Cred.)* fr., soph., mu.; prereq., 1-2-3)				
7w-8s	Ear-Training	VII	MTh	Mu	Ar
10f-11w-12s	First Year Organ	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				
13f-14w-15s	Second Year Organ	Ar	Ar	Mu	Ar
	(6 or 12 cred.; soph. mu.; prereq., 10-11-12)				
16f-17w-18s	First Year Pianoforte.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				
19f-20w-21s	Second Year Pianoforte.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; soph. mu.; prereq., 16-17-18)				
22f-23w-24s	First Year Violin.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				
25f-26w-27s	Second Year Violin.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; soph. mu.; prereq., 22-23-24)				

* Course 7-8-9 carries 3 credits for freshmen; none for sophomores.

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

§ Entrance requirements, according to instrument selected, are:

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

Voice: Good natural equipment and 2 years of piano.

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

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
28f-29w-30s	First Year Vocal Training..... (6 or 12 cred.; fr. mu.)	Ar	Ar	Mu	Ar
31f-32w-33s	Second Year Vocal Training.... (6 or 12 cred.; soph. mu.; pre- req., 28-29-30)	Ar	Ar	Mu	Ar
34f-35w-36s	First Year of Other Orchestral Instruments	Ar	Ar	Mu	Ar
	(6 or 12 cred.; fr. mu.)				
37f-38w-39s	Second Year of Other Orchestral Instruments	Ar	Ar	Mu	Ar
	(6 or 12 cred.; soph. mu.; pre- req., 37-38-39)				
40f-41w-42s	Orchestra	7:30 p.m.	W	Mu	Mr. Pepinsky
	String Section	IX	T	Mu	Ar
	(3 cred.; jr., sr.)				
43f-44w-45s	University Chorus	7 p.m.	T	Mu	Mr. Killeen
	(3 cred.; fr. and soph. mu., acad. jr., sr.)				
50f-51w-52s	Third Year Organ.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; jr., prereq., 13- 14-15)				
53f-54w-55s	Fourth Year Organ.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; sr.; prereq., 50- 51-52)				
56f-57w-58s	Third Year Piano.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; jr.; prereq., 19- 20-21)				
59f-60w-61s	Fourth Year Piano.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; sr.; prereq., 56- 57-58)				
62f-63w-64s	Third Year Violin.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; jr.; prereq., 25- 26-27)				
65f-66w-67s	Fourth Year Violin.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; sr.; prereq., 62- 63-64)				
68f-69w-70s	Third Year Vocal Training.....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; jr.; prereq., 31- 32-33)				
71f-72w-73s	Fourth Year Vocal Training....	Ar	Ar	Mu	Ar
	(6 or 12 cred.; sr.; prereq., 68- 69-70)				
74f-75w-76s	Third Year and Other Orchestral Instruments	Ar	Ar	Mu	Ar
	(6 or 12 cred.; jr.; prereq., 37- 38-39)				
77f-78w-79s	Fourth Year of Other Orchestral Instruments	Ar	Ar	Mu	Ar
	(6 or 12 cred.; sr.; prereq., 74- 75-76)				
86f-87w-88s	Normal Piano	VII	MWF	Mu	Miss Reeves
	(6 cred.; jr.; prereq., 2 yrs. piano)				
89f-90w-91s	Adv. Normal Piano.....	VIII	MWF	Mu	Miss Reeves
	(6 cred.; sr.; prereq., 86-87-88)				

PROGRAM

No.	Title	Hour	Day	Room	Instructor
92f-93w-94s	Principles of Vocal Technique... (3 cred.; all; no prereq.)	III	W	Mu	Mr. Killeen
100f-101w-102s	Composition-Orchestration (6 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	Ar	Ar	Mu	Mr. Ferguson
103f-104w-105s	Analysis (3 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	III	T	Mu	Mr. Pepinsky
106f-107w-108s	History of Music..... (9 cred.; jr., sr.; prereq., 1-2-3, 4-5-6)	II	MWF	Mu	Mr. Ferguson
109f-110w-111s	Bach and Beethoven..... (9 cred.; sr.; prereq., 106-107- 108)	VII, VIII	TTh	Mu	Mr. Ferguson
112f-113w-114s	Ensemble (6 cred.; jr.)				
	Sec. 1	II	TTh	Mu	Mr. Pepinsky
	(For voice students) 2	VII	TTh	Mu	Miss Hull
115f-116w-117s	Advanced Ensemble (6 cred.; sr.; prereq., 112-113- 114)				
	Sec. 1	IV	MW	Mu	Mr. Pepinsky
	(For voice students) 2	VI	MW	Mu	Mrs. Richter
121f-122w-123s	Romantic Movement (6 cred.; jr., sr.; prereq., 106- 107-108)	VII	WF	Mu	Miss Kendall
124f-125w-126s	Advanced Harmony (6 cred.; jr.; prereq., 4-5-6)	Ar	Ar	Mu	Mr. Scott
127f-128w-129s	Advanced Composition (9 cred.; sr.; prereq., 4-5-6)	Ar	Ar	Mu	Mr. Ferguson

ORIENTATION

No.	Title	Hour	Day	Room	Instructor
1f-2w†	Orientation (10 cred.; entering freshmen only; no prereq.)	III	MTThFS	301F	VI
1w-2s†	Orientation (See 1f-2w)	III	MTThFS	209OL	

PHILOSOPHY

Major Adviser: D. F. Swenson

No.	Title	Hour	Day	Room	Instructor
1f	Problems of Philosophy..... (5 cred.; soph., jr., sr.; no pre- req.)				
	Sec. 1	II	MWThFS	321F	Ar
	2	VII	MTWThF	322F	Mr. Conger
1w	Problems of Philosophy..... (See 1f)				
	Sec. 1	III	MTThFS	321F	Mr. Swenson
	2	VII	MTWThF	322F	Mr. Conger

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

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
1s	Problems of Philosophy..... (See 1f)				
	Sec. 1	IV	MTWFS	321F	Mr. Conger
	2	VI	MTWThF	321F	Ar
2f	Logic (5 cred.; soph., jr., sr.; no pre- req.)				
	Sec. 1	III	MTThFS	321F	Mr. Swenson
	2	IV	MTWFS	321F	Ar
2w	Logic (See 2f)				
	Sec. 1	IV	MTWFS	321F	Ar
	2	VII	MTWThF	321F	Ar
2s	Logic (See 2f)				
	Sec. 1	III	MTThFS	321F	Mr. Swenson
	2	IV	MTWFS	113F	Ar
3f	Ethics (5 cred.; soph., jr., sr.; no pre- req.)				
	IV	IV	MTWFS	322F	Ar
3s	Ethics (See 3f)	I	TWThFS	322F	Ar
10s	Science and Religion (2 cred.; soph., jr., sr.; prereq., 10 cred. in phil. or the sciences)	VII	TTh	321F	Mr. Conger
50w	Ancient and Medieval Philosophy (5 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MTWFS	322F	Ar
11s	Modern Philosophy (5 cred.; jr., sr.; prereq., 10 cred. or 15 cred. in phil. and soc. sci.)	IV	MTWFS	322F	Ar
100f	History of Religions..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Conger
101w	Psychology of Religion..... (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Conger
102s	Philosophy of Religion (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	TThS	322F	Mr. Swenson
103s	Esthetics (3 cred.; jr., sr., grad.; prereq., 10 cred.)	II	MWF	322F	Mr. Swenson
104	<i>History of Esthetic Theory</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)	<i>Not offered in 1925-26.</i>			
108-109	<i>History of Ethics</i> (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	<i>Not offered in 1925-26.</i>			
120	<i>Scandinavian Philosophy</i> (3 cred.; jr., sr., grad.; prereq., 10 cred.)	<i>Not offered in 1925-26.</i>			

PROGRAM

No.	Title	Hour	Day	Room	Instructor
124f	Political and Social Ethics..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Ar
129W	Modern Political Thought..... (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Ar
135f-136w	Philosophy of Plato..... (6 cred.; jr., sr., grad.; prereq., 10 cred.)	VIII	MWF	339Lib	Mr. Swenson
141f-142w	Metaphysics (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	II	MWF	339Lib	Mr. Swenson
147-148	<i>Advanced Logic</i> (6 cred.; jr., sr., grad.; prereq., 10 cred. in phil. incl. 2)	<i>Not offered in 1925-26.</i>			
151-152	<i>Modern Idealism</i> (6 cred.; sr., grad.; prereq., 15 cred. in phil.)	<i>Not offered in 1925-26.</i>			
161f-162w-163s	Seminar in Philosophy..... (9 cred.; sr., grad.; prereq., 20 cred. in phil. and consent of instructor)	Ar	Ar	Ar	Mr. Swenson, Mr. Conger

PHYSICS

Major Adviser: H. A. Erikson

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Sixteen quarter credits in physics.

For university teacher's certificate in natural science, see specialized curriculum, Part I of Education bulletin.

Introductory Courses

No.	Title	Hour	Day	Room	Instructor	
1f	Elem. of Mechanics and Sound.. (3 cred.; all; prereq., Math. 4, or 6)	Lect.	VIII	MWF	30Ph	Mr. Erikson
		Quiz	II or IX	Th	305E	
				Th	100C	
1w	Elem. of Mechanics and Sound.. (See 1f)	Lect.	VIII	MWF	30Ph	Mr. Erikson
		Quiz	IX	T	30Ph	
1s	Elem. of Mechanics and Sound.. (See 1f)	Lect.	III	TThS	30Ph	Mr. Erikson
		Quiz	IX*	F	305E	

* Students who take Chemistry 108 laboratory at VIII, IX, MWF should try to arrange with Professor Erikson for another quiz hour.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
2f,w,s,	Elem. of Mechanics Lab..... (1 cred.; all; prereq., 1 or reg. in 1)				
	Sec. 1	VI, VII§	T	16Ph	Mr. Erikson
	2	VII, IX§	T	16Ph	and assistants
	3	I, II§	Th	16Ph	
9s†	Acoustics (3 cred.; all; no prereq.)	VIII	MWF	30Ph	Mr. Buchta
21f	Heat (3 cred.; all; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Miller
	Quiz	IX	Th	30Ph	Mr. Miller
21w	Heat (For schedule of hours, see	Physics 23w, Engineering program)			
22f	Heat Laboratory (1 cred.; all; prereq., 2, 21, or reg. in 21)				
	Sec. 1	VI, VII	M	23Ph	Mr. Miller
	2	VIII, IX	M	23Ph	and assistants
	3	VI, VII	T	23Ph	
	4	VIII, IX	T	23Ph	
22w	Heat Laboratory (See 22f)				
	Sec. 1	VI, VII	T	23Ph	Mr. Miller
	2	VIII, IX	T	23Ph	
	3	I, II	Th	23Ph	
	4	VIII, IX	Th		
31f,s	Optics (3 cred.; all; prereq., 1)				
	Lect.	I	TThS	30Ph	Mr. Valasek
	Quiz	IX	F	30Ph	Mr. Valasek
32f,s	Optics Laboratory (1 cred.; all; prereq., 2, and 31 or 35 or reg. in 31 or 36)				
	Sec. 1	VI, VII	Th	23Ph	Mr. Valasek
	2	VI, VII	F	23Ph	Mr. Valasek
	3	III, IV	S	23Ph	Mr. Valasek
35w,s	Optics (2 cred.; all; prereq., 1)				
	Lect.	VI	TTh	30Ph	Mr. Valasek
	Quiz	IX	F	30Ph	
41w	Electricity (3 cred.; all; prereq., 1)				
	Lect.	III	TThS	30Ph	Mr. Zeleny
	Quiz	IX	Th	30Ph	Mr. Zeleny
41s	Electricity (For schedule of hours, see Physics 43s, Engineering program)				
42w	Electricity Laboratory (1 cred.; all; prereq., 2, 41 or reg. in 41)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny
	2	VIII, IX	T	31Ph	and assistants
	3	VI, VII	W	31Ph	

† Does not count as part of the pre-medical requirement in physics.

§ Students who cannot enter one of the three sections listed should register for the course at "hours to be arranged" and report to Professor Erikson.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
42s	Electricity Laboratory (See 42w)				
	Sec. 1	VI, VII	T	31Ph	Mr. Zeleny
	2	VIII, IX	T	31Ph	
	3	I, II	Th	31Ph	
	4	VIII, IX	Th	31Ph	
<i>Intermediate Courses</i>					
101f-103w-105s	Theoretical Physics (15 cred.; jr., sr., grad.; prereq., 12 cred. in phys., Math. 51)	IV	MTWFS	2Ph	Mr. Tate
102f	Laboratory Arts (3 cred.; jr., sr., grad.; prereq., 12 cred.)				
	Sec. 1	VI, VII, VIII	MW	2Ph	Mr. Buchta
	2	VI, VII, VIII	TTh	2Ph	Mr. Buchta
104w	Precision Mechanics (3 cred.; jr., sr., grad.; prereq., 12 cred. and Math. 51)				
	Sec. 1	VI, VII, VIII	MW	2Ph	Mr. Buchta
	2	VI, VII, VIII	TTh	2Ph	Mr. Buchta
114f-116w-118s	Elem. Phys. Investigation..... (3 cred.; jr., sr., grad.; prereq., 104, Math. 51)	Ar	Ar	1Ph	Mr. Tate
115f-117w-119s	Problem Course (3 cred.; jr., sr., grad.; prereq., 12 cred., Math. 51)	Ar	Ar	20Ph	Mr. Buchta
122s	Pyrometry and Heat..... (3 cred.; jr., sr., grad.; prereq., 21 and 22)	VI-IX	MW	23Ph	Mr. Miller
132w	Applied Optics (3 cred.; jr., sr., grad.; prereq., 31 and 32)	Ar	Ar	3Ph	Mr. Valasek
142f	Elec. Measurements (3 cred.; jr., sr., grad.; prereq., 41 and 42)	See 144f, Engineering program			Mr. Zeleny
146w	Elec. Meas. of Precision..... (3 cred.; jr., sr., grad.; prereq., 142)	Ar	Ar	12Ph	Mr. Zeleny
148w	Radioactivity (3 cred.; jr., sr., grad.; prereq., 41, 42)	Ar	Ar	15Ph	Mr. Erikson
150s	Conduction through Gases..... (3 cred.; jr., sr., grad.; prereq., 142)	Ar	Ar	Ar	Mr. Erikson

POLITICAL SCIENCE

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate in government.—Major recommendation: at least 36 credits in political science including American Government, State or Municipal Government, Introduction to Political Science and at least 12 credits in senior college courses not including Course 51-52-53.

Minor recommendation: at least 18 credits in political science including American Government, Introduction to Political Science, and either State or Municipal or Comparative European Government.

NOTE.—The following courses in other departments carry credit also in this department:

Economics 154, Public Utilities; 169, Labor and Socialist Movement in Europe; 191-192, Public Finance; and 193, State and Local Taxation.

History 33-34, English Legal Institutions; 106-107-108, Europe 1815-1914; 109, Modern England; 146-147, Constitutional History of the United States; 153, The West in American Politics since 1865; 168, Topics in American Foreign Relations.

Sociology 140, History of Social Theory.

Civil Engineering 53, Municipal Engineering.

Philosophy 129, Modern Political Thought.

Introductory Courses

No.	Title	Hour	Day	Room	Instructor
1f,w,s	American Government (5 cred.; soph., jr., sr., and fr. with 10 cred. in hist. or econ.; no prereq.)	Lect. IV Sec. 1 I 2 II 3 III 4 IV 5 VI 6 VII	MWF TTh	OLAud 209OL 107F 322F TS 221OL 3F 211OL	Mr. Young
2f,w,s	(Fall and spring only) State Government (5 cred.; soph., jr., sr., and fr. with 10 cred. in hist.; no pre- req.)	7 VII	TTh	221OL	
		Lect. VI Sec. 1 VI 2 VI 3 VII 4 Ar 5 Ar	MWF TTh TTh TTh Ar TTh	211OL 211OL 6F 6F Ar Ar	Mr. Lambie

Intermediate Courses

3f,w,s	Comparative European Govern- ment	IV	MTWFS	211OL	Mr. Gaus
11f,w,s	(5 cred.; soph., jr., sr.; prereq., 1) Municipal Government	I	TWThFS	211OL	Mr. Anderson
15f,w,s	(5 cred.; soph., jr., sr.; prereq., 1 or 2) Introd. to Political Science.	III	MTThFS	111OL	Mr. Allin
25f,w,s	(5 cred.; soph., jr., sr.; prereq., 1 or 10 cred. in hist.) World Politics	VI	MTWThF	209OL	Mr. Quigley

PROGRAM

Advanced Courses

No.	Title	Hour	Day	Room	Instructor
51f-52w-53s†*	Business Law (9 cred.; jr., sr.; prereq., 10 cred. in pol. sci. or 10 cred. in econ., or 5 cred. in each)				
	Lect.	II	WF	OLAud	Mr. Young
	Sec. 1	I	M	218aOL	
	2	II	M	218aOL	
	3	IV	M	218aOL	
	4	VI	M	218aOL	
	5	I	T	218aOL	
	6	II	T	218aOL	
	7	IV	T	218aOL	
	8	VI	T	218aOL	
102s	Political Parties (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	TThS	218bOL	Mr. Gaus
105	Colonization (3 cred.; jr., sr., grad.; prereq., 15 cred. or 20 cred. in soc. sci.)	<i>Not offered in 1925-26.</i>			
111w-112s†	Municipal Powers and Functions (6 cred.; jr., sr., grad.; prereq., 18 cred. incl. 11)	III	TThS	211OL(w) 112OL(s)	Mr. Anderson
113	Municipal Problems (3 cred.; jr., sr., grad.; prereq., 18 cred. incl. 11)	<i>Not offered in 1925-26.</i>			
121f-122w†	International Law (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci., or Hist. 106-107-108)	IV	MWF	209OL	Mr. Allin
123s	International Organization (3 cred.; jr., sr., grad.; prereq., same as for 121-122)	IV	MWF	209OL	Mr. Quigley
124	Problems of International Law (3 cred.; jr., sr., grad.; prereq., 121-122)	<i>Not offered in 1925-26.</i>			
125f-126w†	American Diplomatic History (6 cred.; jr., sr., grad.; prereq., 20 cred. in hist. and pol. sci. or 15 cred. in hist. or pol. sci.)	III	MWF	221OL	Mr. Shippee
127	American Foreign Relations (3 cred.; jr., sr., grad.; prereq., 20 cred. in pol. sci. or 20 cred. in hist. incl. Hist. 7-8 or 9)	<i>Not offered in 1925-26.</i>			
130f	Introduction to Administration (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	MWF	209OL	Mr. Gaus

* Cannot be counted for a minor sequence.

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

No.	Title	Hour	Day	Room	Instructor
131w-132s†	Principles of Public Administration (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 10 cred. in pol. sci.)	II	MWF	209OL	Mr. Lambie
136-137†	<i>Far Eastern Government and Pol- itics</i> (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	<i>Not offered in 1925-26.</i>			
138f-139w†	Far Eastern Diplomacy..... (6 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. Course 25, or 10 cred. in pol. sci. and Hist. 1- or 2-3)	VII	MWF	209OL	Mr. Quigley
141f	Problems in State Government and Constitutional Law (3 cred.; jr., sr., grad.; prereq., 15 cred.)	VI	MWF	221OL	Mr. Kumm
145w	Legislative Power and Methods.. (3 cred.; jr., sr., grad.; prereq., 15 cred.)	II	TThS	211OL	Mr. Young
151w-152s†	Constitutional Law (6 cred.; jr., sr., grad.; prereq., 15 cred. incl. 1 senior college course)	VI	MWF	221OL	Mr. Kumm
155s	Administrative Law (3 cred.; jr., sr., grad.; prereq., 15 cred.)	I	MWF	221OL	Mr. Kumm
157f	Police Power (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	II	TThS	211OL	Mr. Young
158s	Government and Business..... (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	II	TThS	211OL	Mr. Young
159w	Law of Public Utilities..... (3 cred.; jr., sr., grad.; prereq., 15 cred. in pol. sci. or Econ. 155.)	I	MWF	221OL	Mr. Kumm
161s	Comparative Federal Government (3 cred.; jr., sr., grad.; prereq., 20 cred.)	II	TThS	209OL	Mr. Allin
166w-167s†	Government and Politics of the British Empire (6 cred.; jr., sr., grad.; prereq., 15 cred. or Hist. 109)	II	MWF	211OL	Mr. Allin
181w	Modern Political Thought (5 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. or 10 cred. in phil.)	I	TWThFS	322F	Ar
187	<i>Problems of Democracy</i> (3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci.)	<i>Not offered in 1925-26.</i>			
190	Jurisprudence (2 cred.; grad. and sr. of suitable preparation)	*		*	Mr. Rottschafer

* Consult the bulletin of the Law School.

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

PREVENTIVE MEDICINE AND PUBLIC HEALTH

MEDICAL SCHOOL

NOTE.—Students desiring to major in this department are advised to consult the special bulletin, obtainable at the office of the registrar.

No.	Title	Hour	Day	Room	Instructor
2f	First Aid (1 cred.; no prereq.) (Limited to 20 women)	VI, VII	W	§	Miss Fisher
2w	First Aid (See 2f) (Limited to 20 women)	VI, VII	F	§	Miss Fisher
3f,w,§	Personal Hygiene and Elementary Sanitation (2 cred.; fr., soph.; no prereq.) (Limited to 80 men)	IV	TS	112MH	Dr. Lees, Dr. Cady
50f,w,su	Public and Personal Health..... (3 cred.; jr., sr.; prereq., An. Biol. 1-2 and Psy. 1-2)	V	MWF	112MH	Dr. O'Brien
52f,w,s	Health Care of the Family..... (3 cred.; jr., sr.; prereq., Bact. 51, Physiol. 4) (Lab. sections limited to 20)	Lect. I Sec. 1 VI, VII 2 VI, VII	S TTh	213HE §	Dr. Mayer Miss Fisher
53f,su	Elements of Preventive Medicine (3 cred.; jr., sr.; prereq., Pys. 1-2; Bact. 51 or equiv.)	I	(fall, spring) MF § I, II(winter) MW §	MWF 112MH	Miss Fisher Miss Fisher Dr. Diehl
58w	Maternal and Child Hygiene..... (2 cred.; jr., sr.; prereq., 50 or 52 or 53)	Ar	Ar	112MH	Dr. Boynton, Dr. Adair, and others
59w	Social Hygiene (1 cred.; jr., sr.; prereq., 50 or 52 or 53)	II	S	112MH	Ar
60w	The Tuberculosis Problem..... (2 cred.; jr., sr.; prereq., 50 or 52 or 53)	IV	TS	112MH	Dr. Myers
61w	Mental Hygiene (1 cred.; jr., sr.; prereq., 50 or 52 or 53, Psy. 1-2)	Ar	Ar	112MH	Dr. Hamilton and others
62f,su	Principles of Public Health Nursing (3 cred.; jr., sr.; for public health nurses)	I	TThS	112MH	Miss Butzerin
63w	Special Fields in Public Health Nursing (3 cred.; jr., sr.; public health nurses; prereq., 62 or equivalent)	I	TThS	112MH	Miss Butzerin

‡Students who take this Course 3 need not take the required Physical Education Course 4.
§ Woman's Hall, University Farm.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
64f,w,s,su	Field Practice in Infant Welfare Nursing	Ar		Ar Ar	Miss Butzerin
	(108 hrs.; 3 cred.; jr., sr.; pre-req., 58 and 62)				
65f,w,s	Field Practice in School Nursing (80 hrs.; 2 cred.; jr., sr.; pre-req., 62)	Ar		Ar Ar	Miss Butzerin
66f,w,s,su	Field Practice in County Nursing (80 hrs.; 2 cred.; jr., sr.; pre-req., 62)	Ar		Ar Ar	Miss Butzerin
67f,w,s,su	Field Practice in a Tuberculosis Sanatorium	Ar		Ar Ar	Dr. Mariette
	(80 hrs.; 2 cred.; jr., sr.; pre-req., 60 and 62)				
68f,w,s,su	Field Practice in Visiting Nursing	Ar		Ar	Miss Zuppann
	(176 hrs.; 5 cred.; jr., sr.; pre-req., 62)				
73w	Occupational Hygiene and Disease	IV		MW 111MH	Dr. Myers
	(2 cred.; jr., sr.; prereq., 53)				
80w,su	Educational Hygiene	II		MWF 112MH	Dr. Diehl
	(3 cred.; jr., sr.; prereq., 50 or 52 or 53)				
102f,w,s,su	Sanitation	Ar		Ar *	Dr. Whittaker, Dr. Archibald, Mr. Childs
	(Cred. ar.; jr., sr., grad.; prereq., Bact. 101; Chem. 21 or 27, 32 or 37; Phys. 22, 32, 42)				Miss Wade
103s	Public Health Bacteriology.....	VII, VIII		MWF or ar *	
	(3 cred. or ar.; jr., sr., grad.; prereq., Bact. 101, 116)				
105f,w,s,	Vital Statistics	Ar		Ar *	Dr. Chesley, Mr. Feezer
	(Cred. ar.; jr., sr., grad.; prereq., 53 and Soc. 45, and open to grad. med. stud.)				
106f,w,s	Public Health Administration....	Ar		Ar Ar	Dr. Chesley, Dr. Diehl
	(Cred. ar.; jr., sr., grad.; prereq., 53 or 101)				
107s	Sanitary Surveys	Ar		Ar Ar	Dr. Myers
	(2 cred.; jr., sr., grad.; prereq., 53 or 100)				

PSYCHOLOGY

Major Advisers: R. M. Elliott, W. S. Foster, and D. G. Paterson

No.	Title	Hour	Day	Room	Instructor
1f-2w†	General Psychology				
	(6 cred.; soph., jr., sr.; no pre-req.)				
	Lect.	I		MW OLAud	Mr. Elliott and others
	(one hour) Rec.	I	Th or F or S	Psy	
		II	Th or F or S	Psy	
		VII	Th or F	Psy	
		VIII	Th or F	Psy	

* State Board of Health.

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

PROGRAM

No.	Title	Hour	Day	Room	Instructor
1f-6w†	General Psychology for Business Students (6 cred.; bus. and pre-bus., soph., jr., sr.; no prereq.)	Lect. III	MW	OLAud	Mr. Elliott and others
	(one hour) Rec.	III	Th or F or S	Psy	
		IV	F or S	Psy	
1w-2s†	General Psychology (See 1f-2w. Registration limited. Written permission must be obtained from junior college office)	Ar	Ar	Ar	
1s,2s	General Psychology (6 cred.; see 1f-2w. Registration limited. Written permission must be obtained from junior college office)	Ar	Ar	Ar	
3s	Psychology Applied to Daily Life (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	Lect. II	MW	301F	Mr. Paterson and others
	(one hour) Rec.	I	F	Psy	
		II	Th or F	Psy	
4f-5w†	Introd. Lab. Psychology (4 cred.; soph., jr., sr.; with or after 1-2, or 1-6) (Sections limited to 40)	Sec. 1 I, II	TTh	211Psy	Mr. Foster and others
	(For pre-leg. stud.) 2	III, IV	TS	211Psy	
	3	VI, VII	TTh	211Psy	
	4	VIII, IX	TTh	211Psy	
	5	III, IV	MW	211Psy	
7s	Introd. Lab. Psychology (See 4f-5w) (Identical with 4f-5w combined)	Sec. 1 VI, VII	MTThF	211Psy	Mr. Foster and others
	2	III, IV	MTWF	211Psy	
9	<i>Animal Behavior</i> (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	<i>Not offered in 1925-26.</i>			
15s	Psychology of Sensation (3 cred.; soph., jr., sr.; prereq., 1-2 or 1-6)	II	TThS	Psy	Mr. Foster
56w*	Psych. of Advertising (3 cred.; jr., sr.; prereq., 1-2 or 1-6, and Prin. of Econ.)	VII	MWF	301F	Mr. Paterson
60f	Psychology in Personnel Work (3 cred.; jr., sr.; prereq., 1-2 or 1-6, and Prin. of Econ. or 10 cred. in pol. sci.)	VII	MWF	115Psy	Mr. Paterson
101f-102w†-103s	Experimental Psychology (6 or 9 cred.; jr., sr., grad.; prereq., 1-2, and 4-5 or 7 or 8 cred. in physics)	VII	MWF		
		VIII	WF	116Psy	Mr. Foster

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

* Cannot be counted for a minor sequence.

No.	Title	Hour	Day	Room	Instructor
108f	Systematic Psychology (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7)	III	TThS	109Psy	Miss Heid- breder
109w	Readings in Psychology (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or An. Biol. 1-2)	III	TThS	109Psy	Miss Heid- breder
114w-115s†	Human Behavior (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Biol. 1-2)	II	TThS	109Psy	Mr. Elliott
121f-122w†-123s	Neuro-Psychology (6 or 9 cred.; jr., sr., grad.; pre- req., 1; 2 or 6; 114-115 or 144-145 or by permission)	VII, VIII	MWF	109Psy	Mr. Lashley
124f	Psychology of Learning (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7)	IV	MWF	109Psy	Mr. Lashley
125f-126w†	Psych. of Individual Differences.. (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Ed. Psy. 116-117)	II	MWF	109Psy	Mr. Woodrow
127s	Social Psychology (3 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7 or Biol. 1-2 or 10 cred. in a soc. sci.)	III	TThS	109Psy	Mr. Bird
130s	Vocational Psychology (2 cred.; jr., sr., grad.; prereq., 1-2 or 1-6, 4 additional cred. in psy., educ., or a soc. sci.)	IX, X	F	Psy	Mr. Paterson
144w-145s†	Abnormal Psychology (6 cred.; jr., sr., grad.; prereq., 1; 2 or 6; 4-5 or 7, or Biol. 1-2 or 10 cred. in a soc. sci.)	IV	MWF	115Psy	Mr. Lashley

ROMANCE LANGUAGES

Major Adviser: E. W. Olmsted

REQUIREMENTS OF THE DEPARTMENT

For a teacher's certificate.—Major recommendation: 36 credits in courses numbered above 4, these courses to include 20 (or 50-51-52 and 53-54-55) and survey.

Minor recommendation: 18 credits in one language in courses numbered above 4.

(NOTE.—One credit less for each recommendation to be accepted if the student elects 20 in place of 50-51-52 and 53-54-55.)

Courses in French and Spanish conversation.—May be taken only when accompanied by the corresponding courses in composition. No credit will be given for work done in a course in conversation unless the course in composition is passed also. Courses in composition may be taken separately.

Admission to advanced courses.—No student will be allowed to elect courses more advanced than intermediate French or Spanish, who has not received an average grade of C in the intermediate courses.

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

PROGRAM

FRENCH

No.	Title	Hour	Day	Room	Instructor
(1s)-2f†*	Beginning French	I	TWThFS	202F	Ar
	(See 1f-2w)	VI	MTWThF	213F	Ar
1f-2w†*	Beginning French	I	TWThFS	213F	Ar
	(10 cred.; all; no prereq.)	II	MWThFS	227F	Ar
		IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
1w-2s†*	Beginning French	IV	MTWFS	202F	Ar
	(See 1f-2w)	VI	MTWThF	202F	Ar
1s-(2f)†*	Beginning French	I	TWThFS	227F	Ar
	(See 1f-2w)	IV	MTWFS	102F	Ar
(3s)-4f	Intermediate French	II	MWThFS	306F	Ar
	(See 3f-4w)	IV	MTWFS	124F	Ar
		VI	MTWThF	202F	Ar
3f-4w	Intermediate French	I	TWThFS	125F	Ar
	(10 cred.; all; prereq., 1-2, or 2 yrs. high school French)	III	MTThFS	213F	Ar
		VII	MTWThF	213F	Ar
3w-4s	Intermediate French	I	TWThFS	202F	Ar
	(See 3f-4w)	VI	MTWThF	213F	Ar
3s-(4f)	Intermediate French	I	TWThFS	213F	Ar
	(See 3f-4w)	II	MWThFS	227F	Ar
		IV	MTWFS	227F	Ar
		VI	MTWThF	226F	Ar
		VII	MTWThF	202F	Ar
8f-9w-10s§	Scientific French (pre-med.)....	I	MWF	3F	Ar
	(9 cred.; pre-med.; prereq., 3 or equiv.)				
20f‡	Oral and Written French.....	III	MTThFS	303F	Ar
	(5 cred.; all; prereq., 4 or 3 yrs. high school French)	VII	MTWThF	227F	Ar
20s‡	Oral and Written French.....	I	TWThFS	15F	Ar
	(See 20f)	III	MTThFS	213F	Ar
		VII	MTWThF	213F	Ar
21f-22w-23s†	Survey of French Lit.....	II	TThS	209½F	Mr. Cleifton
	(9 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	III	TThS	227F	Mr. Barton
		VII	MWF	107F	Mr. Sirich
24w-25s†	Survey of French Lit.....	III	MTThFS	303F	Mr. LeCompte
	(10 cred.; all; prereq., 3-4 or 20 or 4 yrs. high school French)	VII	MTWThF	303F	Mr. Watts
49f,w,s	French Pronunciation	VIII	MWF	207F	Mr. Ditchy
	(3 cred.; all; prereq., 3-4 or 4 yrs. high school French)				
50f-51w-52s†	French Conversation¶	III	MW	201F	Ar
	(3 cred.; jr., sr.**; prereq., 3-4)	VI	MW	302F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 5, Science, Literature, and the Arts bulletin, Part II.

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

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

‡ See departmental requirements, note on freshmen entering with three years' high school French (or Spanish). No student may receive credit for both Course 20 and Courses 50-51-52 and 53-54-55.

§ Students may enter any quarter.

** Open without petition to sophomores who have the prerequisites and who satisfy the requirements in General Information, section 43, Science, Literature, and the Arts bulletin, Part I.

¶ Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately. No student may receive credit for both Course 20 and Courses 50-51-52 and 53-54-55.

No.	Title	Heur	Day	Room	Instructor
53f-54w-55s†	French Composition	III	F	201F	Ar
	(3 cred.; jr., sr.**; prereq., 3-4)	VI	F	302F	Ar
56f-57w-58s†	Adv. French Conversation[.....	II	MW	113F	Ar
	(3 cred.; jr., sr.*; prereq., 20	III	MW	203F	Ar
	or 50-51-52)	VI	MW	108F	Ar
59f-60w-61s†	Adv. French Composition.....	II	F	113F	Ar
	(3 cred.; jr., sr.*; prereq., 20	III	F	203F	Ar
	or 53-54-55)	VI	F	108F	Ar
66w	Practical French Phonetics.....	VIII	MWF	203F	Miss Guinotte
	(3 cred.; jr., sr.*; prereq., 20				
	or 50-51-52 and 53-54-55)				
80f-81w-82s†	French Lit., 19th Century.....	IV	MWF	201F	Mr. Barton
	(9 cred.; jr., sr.*; prereq., 21-	VII	MWF	206F	Mr. Clefton
	22-23 or 24-25) *				
100s	French Oral Diction.....	VIII	MTWF	203F	Miss Guinotte
	(4 cred.; jr., sr., grad.; prereq.,				
	62)				
103f-104w-105s†	French Syntax and Comp.....	VI	F	304F	Mr. Barton
	(3 cred.; jr., sr., grad.; prereq.,				
	59-60-61)				
115f-116w-117s†	French Lit.: 17th Century.....	III	TThS	201F	Mr. Searles
	(9 cred.; jr., sr., grad.; prereq.,				
	21-22-23, or 24-25)				
118f-119w-120s†	French Lit.: 18th Century.....	III	TThS	108F	Mr. Sirich
	(9 cred.; jr., sr., grad.; prereq.,				
	21-22-23, or 24-25)				
121-122-123†	French Lit.: 16th Century.....	<i>Not offered in 1925-26.</i>			
	(9 cred.; jr., sr., grad.; prereq.,				
	80-81-82, or 115-116-117 or 118-				
	119-120)				
141s	Realistic Novel: 19th Century....	VII	MTWF	203F	Mr. LeCompte
	(4 cred.; jr., sr., grad.; prereq.,				
	80-81-82)				
150f-151w-152s†	French Dramatic Lit.	III	TTh	203F	Mr. Olmsted
	(6 cred.; jr., sr., grad.; prereq.,				
	21-22-23 or 24-25)				
153f	French Lyric Poetry.....	VI	MTWF	212F	Mr. Searles
	(4 cred.; jr., sr., grad.; prereq.,				
	20-21-22 or 24-25)				
156w	Molière	IV	MTWF	316F	Mr. Searles
	(4 cred.; jr., sr., grad.; prereq.,				
	21-22-23 or 24-25)				
157w	Contemporary French Novel....	VI	MTWF	217F	Mr. Ditchy
	(4 cred.; jr., sr., grad.; prereq.,				
	21-22-23 or 24-25)				
162w	French Romantic Poets.....	VII	MTWF	203F	Mr. LeCompte
	(4 cred.; jr., sr., grad.; prereq.,				
	80-81-82)				

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements in General Information, section 43, Science, Literature, and the Arts bulletin, Part I.

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

‡ Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately. No student may receive credit for both Course 20 and Courses 50-51-52 and 53-54-55.

No.	Title	Hour	Day	Room	Instructor
171f-172w-173s†	History of French Language.... (3 cred.; jr., sr., grad.; prereq., 59-60-61)	VIII	Th	203F	Mr. LeCompte
174f-175w-176s†	Lectures in French..... (6 cred.; jr., sr., grad.; prereq., 50-51-52, 53-54-55 (or 20); and 80-81-82)	IX	TTh	201F	Mr. Ditchy
191f-192w-193s†	Research Meth. and Material.... (3 cred.; sr., grad.; prereq., con- sent of instructor)	IX	M	201F	Mr. Krappe

ITALIAN

1f-2w§†	Beginning Italian	II	MWThFS	203F	Miss Phelps
	(10 cred.; soph., jr., sr.; no pre- req.)				
80	<i>Manzoni, Leopardi</i>	<i>Not offered in 1925-26.</i>			
	(5 cred.; jr., sr.; prereq., 1-2)				
81s	Carducci, Fogazzaro, Giacosa....	II	MWThFS	203F	Miss Phelps
159-160	<i>Dante</i>	<i>Not offered in 1925-26.</i>			
	(6 cred.; jr., sr., grad.; prereq., 80 or 81)				
161f-162w	The Sixteenth Century.....	IV	MWF	203F	Miss Phelps
	(6 cred.; jr., sr., grad.; prereq., 80 or 81)				
164s	Dante (in English).....	IV	MWF	203F	Miss Phelps
	(3 cred.; jr., sr., grad.; prereq., 4 cred. in Eng. beside A-B-C. or Fr. 21-22-23. Required of students taking 159-160)				

SPANISH

(1s)-2f†*	Beginning Spanish	III	MTThFS	107F	Ar
	(See 1f-2w)	VII	MTWThF	201F	Ar
1f-2w†*	Beginning Spanish	I	TWThFS	226F	Ar
	(10 cred.; all; no prereq.)	IV	MTWFS	226F	Ar
		VI	MTWThF	201F	Ar
1w-2s†§	Beginning Spanish	II	MWThFS	202F	Ar
	(See 1f-2w)	III	MTThFS	212F	Ar
		VII	MTWThF	227F	Ar
1s-(2f)†§	Beginning Spanish	II	MWThFS	201F	Ar
	(See 1f-2w)	VI	MTWThF	107F	Ar
(3s)-4f	Intermediate Spanish	II	MWThFS	202F	Ar
	(See 3f-4w)	IV	MTWFS	202F	Ar
		VI	MTWThF	227F	Ar
3f-4w	Intermediate Spanish	II	MWThFS	201F	Ar
	(10 cred.; all; prereq., 1-2 or 2 yrs. high school Spanish)	III	MTThFS	202F	Ar
		VI	MTWThF	102F	Ar
3w-4s	Intermediate Spanish	III	MTThFS	107F	Ar
	(See 3f-4w)	VII	MTWThF	201F	Ar
3s-(4f)	Intermediate Spanish	I	TWThFS	226F	Ar
	(See 3f-4w)	IV	MTWFS	226F	Ar
		VI	MTWThF	201F	Ar

* Credit is usually not given for more than one beginning language. See paragraph 2, page 5, Science, Literature, and the Arts bulletin, Part II.

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

§ Open to freshmen also with the approval of the instructor.

() Numbers in parentheses do not refer to the year 1925-26. See Course Numbering, page 18, Science, Literature, and the Arts bulletin, Part II.

No.	Title	Hour	Day	Room	Instructor
20s†	Oral and Written Spanish..... (5 cred.; all; prereq., 4, or 3 yrs. high school Spanish)	III	MTThFS	202F	Ar
50f-51w-52s†	Spanish Conversation‡ (3 cred.; jr., sr.*; prereq., 3-4)	II	MW	302F	Mr. Torres
53f-54w-55s†	Spanish Composition (3 cred.; jr., sr.*; prereq., 3-4)	II	F	302F	Mr. Torres
56f-57w-58s†	Adv. Spanish Conversation‡..... (3 cred.; jr., sr.*; prereq., 20 or 50-51-52)	VI	MW	203F	Mr. Arjona
59f-60w-61s†	Adv. Spanish Composition..... (3 cred.; jr., sr.*; prereq., 20 or 53-54-55)	VI	F	203F	Mr. Arjona
62	<i>Practical Spanish Phonetics</i> (3 cred.; jr., sr.*; prereq., 65-66- 67, and 20, or 50-51-52 and 53-54-55)	<i>Not offered in 1925-26.</i>			
65f-66w-67s†	Survey of Spanish Lit..... (9 cred.; jr., sr.*; prereq., 3-4)	II	TThS	302F	Mr. Arjona
68w-69s†	Survey of Spanish Lit. (10 cred.; jr., sr.*; prereq., 3-4)	VI	MTWThF	227F	Mr. Torres
73-74-75†	<i>Span. Commer. Correspond.</i> (3 cred.; jr., sr.*; prereq., 20, or 53-54-55)	<i>Not offered in 1925-26.</i>			
80f-81w-82s†	Spanish Lit.: 19th Century..... (9 cred.; jr., sr.*; prereq., 65-66- 67, or 68-69)	IV	MWF	213F	Mr. Fichter
83f-84w-85s†	Spanish American Lit. (6 cred.; jr., sr.*; prereq., 65- 66-67 or 68-69 or 20 or 50- 51-52 and 53-54-55)	VII	MW	226F	Mr. Torres
100	<i>Spanish Oral Diction</i> (4 cred.; jr., sr., grad.; prereq., 56-57-58)	<i>Not offered in 1925-26.</i>			
103f-104w-105s†	Spanish Syntax (3 cred.; jr., sr., grad.; prereq., 59-60-61)	VIII	W	108F	Mr. Arjona
115-116-117	<i>Spanish Lit.: 17th Century</i> (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered in 1925-26.</i>			
141w	Spanish Novel (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	III	TThFS	302F	Mr. Fichter
150s	Spanish Dramatic Lit. (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	III	TThFS	302F	Mr. Fichter

* Open without petition to sophomores who have the prerequisites and who satisfy the requirements given in General Information, section 43. Science, Literature, and the Arts bulletin, Part I.

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

‡ See departmental requirements, note on freshmen entering with three years' high school French (or Spanish). No student may receive credit for both Course 20 and Course 50-51-52 and 53-54-55.

§ Courses in conversation may be taken only when accompanied by the corresponding courses in composition. Courses in composition may be taken separately.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
156f-157w-158s†	Spanish Lit.: 16th Century..... (6 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	IV	TS	217F	Mr. Krappe
159	<i>Cervantes</i> (4 cred.; jr., sr., grad.; prereq., 65-66-67, or 68-69)	<i>Not offered in 1925-26.</i>			
174f-175w-176s	Lectures in Spanish..... (6 cred.; jr., sr., grad.; prereq., 20 (or 50-51-52 and 53-54-55) and 65-66-67)	IX	TTh	202F	Mr. Arjona

SCANDINAVIAN

No.	Title	Hour	Day	Room	Instructor
1f-2w*	Beginning Norwegian (10 cred.; all; no prereq.)	I	TWThFS	206F	Mr. Bothne
3s	Intermediate Norwegian (5 cred.; all; prereq., 1-2, or 1 yr. high school)	I	TWThFS	206F	Mr. Bothne
4f-5w	Adv. Norwegian (Survey)..... (10 cred.; soph., jr., sr.; prereq., 1-2-3 or 2 yrs. high school)	III	MTThFS	206F	Mr. Bothne
7f-8w*	Beginning Swedish (10 cred.; all; no prereq.)	II	MWThFS	206F	Mr. Stomberg
9s	Intermediate Swedish (5 cred.; all; prereq., 7-8 or 1 yr. high school)	II	MWThFS	206F	Mr. Stomberg
10f-11w	Adv. Swedish (10 cred.; soph., jr., sr.; prereq., 7-8-9 or 2 yrs. high school)	I	TWThFS	110F	Mr. Stomberg
12s	Ancient and Medieval Scandina- vian History (5 cred.; soph., jr., sr.; prereq., 10-11, or 4-5, or Hist. 1-2)	I	TWThFS	110F	Mr. Stomberg
45s	Scandinavian Mythology (3 cred.; jr., sr.; † prereq., none)	IV	MWF	206F	Mr. Stomberg
101f-102w-103s	Modern Norwegian Lit. (9 cred.; jr., sr., grad.; prereq., 4-5)	II	TThS	110F	Mr. Bothne
104f-105w	Mod. Scand. History..... (6 cred.; jr., sr., grad.; prereq., 10-11-12, or 4-5, or 15 cred. in hist.)	VI	MWF	206F	Mr. Stomberg
107f-108w-109s	Modern Swedish Lit. (9 cred.; jr., sr., grad.; prereq., 10-11-12)	VI	MWF	206F	Mr. Stomberg
110w	Ibsen (3 cred.; sr., grad.; prereq., 101- 102-103)	IV VI	T TTh	206F 206F	Mr. Bothne
111-112-113	<i>Old Norse (Icelandic)</i> (6 cred.; sr., grad.; prereq., con- sent of instructor)	<i>Not offered in 1925-26.</i>			

* Credit is usually not given for more than one beginning language. See paragraph 2, page 5, Science, Literature, and the Arts bulletin, Part II.

† Does not count as a senior college course. Not open to sophomores under General Information, section 43, Science, Literature, and the Arts bulletin, Part I.

‡ The entire course must be completed before credit is received for any quarter.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
114f	Strindberg	Ar	Ar	Ar	Mr. Stomberg
	(3 cred.; sr., grad.; prereq., 107-108-109)				
116	<i>History of Scandinavian Languages</i>		<i>Not offered in 1925-26.</i>		
	(3 cred.; sr., grad.; prereq., 101-102-103 or 107-108-109 or 117 or 111)				
117s	Earlier Norwegian Lit.	III	MTThFS	206F	Mr. Bothne
	(5 cred.; jr., sr., grad.; prereq., 4-5)				
130-131-132	<i>Danish Lit. of the 19th Century</i>		<i>Not offered in 1925-26.</i>		
	(9 cred.; jr., sr., grad.; prereq., 4-5)				
134-135	<i>The Landsmaal Movement</i>		<i>Not offered in 1925-26.</i>		
	(6 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)				
136s	Björnson	Ar	Ar	Ar	Mr. Bothne
	(3 cred.; sr., grad.; prereq., 101-102-103, or 130-131-132)				

SOCIOLOGY AND SOCIAL WORK

Major Adviser: R. L. Finney

No.	Title	Hour	Day	Room	Instructor
1f	Intro. to Sociology				
	(5 cred.; soph., jr., sr., and 3d qtr. fr.; no prereq.)				
	Sec. 1	I	TWThFS	9F	Mr. Chapin
	2	III	MTThFS	5F	
	3	IV	MTWFS	9F	
	4	VI	MTWThF	9F	
	5	VII	MTWThF	5F	
	(University Farm, 3 6 cred.)	IV	MWF	*	
1w	Intro. to Sociology				
	(See 1f)				
	Sec. 1	I	TWThFS	9F	Mr. Chapin
	2	III	MTThFS	5F	
	3	IV	MTWFS	9F	
	4	VI	MTWThF	9F	
	5	VII	MTWThF	5F	
	(University Farm, 3 6 cred.)	IV	MWF	*	
1s	Intro. to Sociology				
	(See 1f)				
	Sec. 1	I	TWThFS	9F	Mr. Chapin
	2	II	MWThFS	3F	
	3	III	MTThFS	9F	
	4	IV	MTWFS	9F	
	5	VI	MTWThF	9F	
	6	VII	MTWThF	5F	
	7	VIII	MTWThF	9F	
	(University Farm, 3 8 cred.)	IV	MWF	*	

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
6f,w,s	Modern Social Reform Move- ments (3 cred.; soph., jr., sr.; prereq. 1)				
	Sec. 1	II	TThS	5F	Mr. Clarke
	2	IV	MWF	5F	
	3	VI	MWF	6F	
14f,w	Rural Sociology (3 cred.; soph., jr., sr.; prereq. 1)				
	Sec. 1	III	TThS	9F	Mr. Zimmer- man
	2	V	MWF	9F	
	3	VI	MWF	3F	
	(University Farm) 4	IV	TThS	*	
14s	Rural Sociology (See 14f,w)				
	Sec. 1	III	TThS	3F	Mr. Zimmer- man
	2	V	MWF	9F	
	3	VI	MWF	3F	
45f,w	Social Statistics (5 cred.; soph., jr., sr.; prereq., 1)	VII	MTWThF	9F	Mr. Chapin
51f,w,s	The Occurrence of the Socially In- adequate (3 cred.; jr., sr.; prereq., 10 cred. in soc. sci. or psy.)	I	MWF	5F	Ar
52f,w,s	Elem. Case Work..... (3 cred.; jr., sr.; prereq., 51)	I	TThS	5F	Ar
53f,w,s	Elem. of Criminology..... (3 cred.; jr., sr.; prereq., same as for 51)	III	MWF	3F	Ar
55w	Housing Problems (3 cred.; jr., sr.; prereq., same as for 51)	I	MWF	111OL	Ar
60f,w	Child Welfare (3 cred.; jr., sr.; prereq., 51 and 52)	IX	MWF	9F	Miss Keating
70w	Group Work in the Community... (3 cred.; jr., sr.; prereq., 51)	VIII, IX	T	5F	Miss Mead, Mrs. Rempel
90f,w,s-91f,w,s- 92f,w,s	Elementary Field Work..... (6 cred.; jr., sr.; prereq., 51)				
	(Fall)				
	Sec. 1	I, II, III	MW		Mrs. Rempel
	2	I, II, III	WF		
	3	VI, VII, VIII	MW		
	4	VI, VII, VIII	WF		
	5	VI, VII, VIII	TTh		
	(Winter)				
	Sec. 1	II, III, IV	MW		Mrs. Rempel
	2	II, III, IV	WF		
	3	VI, VII, VIII	MW		
	4	VI, VII, VIII	WF		
	5	VI, VII, VIII	TTh		
	(Spring)				
	Sec. 1	VI, VII, VIII	MW		Mrs. Rempel
	2	VI, VII, VIII	WF		
	3	II, III, IV	TTh		
	4	VI, VII, VIII	TTh		

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

COLLEGE OF EDUCATION

No.	Title	Hour	Day	Room	Instructor
100f	Social Psychology (3 cred.; primarily for sociology students; jr., sr., grad.; prereq., Soc. 1, Psy. 1-2, and 11 cred. in soc. sci., educ., phil., and psy.)	II	TThS	9F	Mr. Chapin
101W	Social Organization (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cred. in soc. sci., educ., phil., or psy.)	II	TThS	9F	Mr. Sorokin
102S	Social Control (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	TThS	9F	Mr. Finney
103S	Sociology of Conflict..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	9F	Mr. Clarke
110W	Community Organization and Social Work in Small Towns and Country (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	5F	Mr. Elmer
112f	The Rural Social Survey..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	VIII	MWF	9F	Mr. Elmer
114S	Rural Social Institutions..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	MWF	*	Mr. Lundquist
115	<i>The Rural Church As a Social Institution</i> (3 cred.; jr., sr., grad.; prereq., same as for 101)	<i>Not offered in 1925-26.</i>			
119f	The Family (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	TThS	3F	Mr. Clarke
120f	Social Progress (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	15F	Mr. Wallis
121W	Advanced Statistical Methods.... (3 cred.; jr., sr., grad.; prereq., 4 courses in soc., including 45 or its equivalent)	VII	MWF	108F	Mr. Chapin
122W-123S	Methods of Social Investigation.. (6 cred.; jr., sr., grad.; prereq., same as for 101 but including 45 or its equivalent for 123S)	VIII	MWF	3F	Mr. Elmer
126-127	<i>Settlement and Community Center Work</i> (4 cred., sr., grad.; prereq., consent of director)	<i>Not offered in 1925-26.</i>			
128S	Principles of Administration Applied to Social Work..... (2 cred.; jr., sr., grad.; prereq., same as for 101)	VIII, IX	Th	5F	Ar

* Consult the bulletin of the College of Agriculture, Forestry, and Home Economics.

PROGRAM

No.	Title	Hour	Day	Room	Instructor
130s	Advanced Case Work..... (2 cred.; sr., grad.; prereq., same as for 101 incl. 51 and 52)	VIII, IX	T	3F	Ar
132	Juvenile Courts and Probation... (2 cred.; jr., sr., grad.; prereq., 51, 52, 53)	<i>Not offered in 1925-26.</i>			
133f	Social Case Work in Health Problems	IX and ar	WF and ar	5F	Mrs. Young
134s	Legal Protection of the Child.... (3 cred.; jr., sr., grad.; prereq., same as for 101 incl. 60)	IX	MWF	5F	Ar
135s	Field Practice in Legal Protection of the Child..... (2 cred.; jr., sr., grad.; prereq., open to students taking 134)	Ar	Ar	Ar	Ar
138w-139s	Mental Case Work..... (6 cred.; jr., sr., grad.; prereq., same as for 130)	IX	TTh and ar	9F	Mrs. Young
140w	History of Social Theory..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	MWF	108F	Mr. Sorokin
141s	Contemp. Social Theory..... (3 cred.; jr., sr., grad.; prereq., same as for 101)	II	TThS	108F	Mr. Sorokin
152	<i>Seminar: Problems of Institutional Administration</i> (2 cred.; sr., grad.; prereq., consent of director)	<i>Not offered in 1925-26.</i>			
153f,154w,155s	Advanced Field Work..... (3 cred. per qtr.; jr., sr., grad.; prereq., 90 and 91)	Ar	Ar	Ar	Ar
158w	The Sociology of Revolution.... (3 cred.; jr., sr., grad.; prereq., same as for 101)	III	MWF	Ar	Mr. Sorokin
187f-188w-189s	Seminar in Educ. Sociology..... (6 cred.; jr., sr., grad.; prereq., same as for 101, including 1 and 6)	I, II	S	206OL	Mr. Finney

**Bulletin of the University of
Minnesota**

SUPPLEMENT

College of Education

Additional Announcements for the Year, 1925-26

Vol. XXVII, No. 42

August 3, 1925

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GENERAL INFORMATION

Standards in English.—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.

**REVISED CURRICULUM IN TRADE AND INDUSTRIAL
EDUCATION**

Major Adviser: Homer J. Smith

FALL			WINTER			SPRING		
No.	Title	Credits	No.	Title	Credits	No.	Title	Credits
Eng. Af	Rhet.	5	Eng. Bw	Rhet.	5	Eng. Cs	Rhet.	5
Ind. 40f	Analysis	2	Ind. 42w	Selection of		Ind. 25s	Lit. of Ind. Ed.	2
Ind. 20f	Ind. Hist.	2	Rel. Mat. (Prereq.,			Shopwork	.....	2
Shopwork	.....	4	40f)		2	Drawing	.....	3
Drawing	.....	2	Shopwork	.....	3	Electives	.....	3
			Drawing	.....	3			
			Electives	.....	2			
Econ. 3f	Prin. of Econ.	5	Econ. 4w	Prin. of Econ.	5	Soc. 1s	Introd. to Soc.	5
Psych. 1f	Gen. Psych.	3	Psych. 2w	Gen. Psych.	3	Ed. Psych. 55	Ed. Psych.	3
Ind. 60f	Soc. Agencies		Ind. 61w	Soc. Sig. of		Drawing (Prereq.,		6
in Ed.		2	Voc. Ed. (Prereq.,			cred. in Gen. Psych.)		2
Shopwork	.....	3	Ind. 60)	.....	2	Electives	.....	5
Electives	.....	2	Shopwork	.....	3			
			Electives	.....	2			
Ind. 80f	Gen. Ind. Tr.	2	Ed. 3w	Ed. Soc. (Pre-		Ind. 14s	Methods in	
124f	Ed. Admin. (Pre-		req., Soc. 1)	3	Drawing (10 cred. in			
req. 10 hrs. in Ed.)		3	Ind. 70w	Methods in		Draw. or by permis-		
15f	Technique of Teach-		Shop Subjects (Pre-		sion)	2		
ing	.....	3	req., 40)	2	Ind. 66s	Methods in		
Electives	.....	7	Ind. 30w	Graphic Pres-		Rel. Subj. (Prereq.,		
			entation	2	40 and 42)	2		
			167w	Junior H.S.		Ed. 103s	Hist. of Elem.	
			Electives	.....	6	Ed. ....	.....	3
						168s	Junior High School	2
						Electives	.....	6

Ind. 50f Prac. Teach... 2	Ind. 50w Prac. Teach... 2	Ind. 50s Prac. Teach. (Prereq., 50 and 51) 2
Ind. 170f Admin. (con- sult adviser) (Day School) 2	Ind. 171w Admin. (Pre- req., 50f) (Evening School) (Prereq., 170) 2	Ind. 172s Admin. (Part Time School) Prereq., 171) 2
134f Mental Tests 2	Ind. 110w Guide in the Schools (Prereq., 134) 2	Psych. 130s Voc. Psych. 2
Electives 9	Electives 9	Electives 9

Required, as specified, 120 quarter credits. Advised electives, 60 quarter credits.
Total 180 credits.

Mathematics, Science, Art, and Athletic Coaching are appropriate elective fields.
The above requirement of 15 credits in Shopwork and 10 in Drawing (25 total) may
be extended by election to not to exceed 45 credits total.

DESCRIPTION OF NEW COURSES

EDUCATION-GENERAL COURSES

228-229-230. Problems of College Education. First term: Problems of Student Personnel. Second Term: Problems of College Teaching. Third term: Problems of College Administration.

ADMINISTRATION AND SUPERVISION

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.

HISTORY AND PHILOSOPHY OF EDUCATION

140-141. Topics in the History of Education.

HOME ECONOMICS EDUCATION

141. Home Economics Problems in Vocational Education. 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.

LIBRARY METHODS

- Ed7. School Library Organization. Covers routine of organization, classification, and installation of all necessary records except the card catalog. Also care of periodicals, mending, binding and bindery records, care of unbound material, and miscellaneous problems of administration.
- Ed8. 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.

- Ed9. Reference Work in the School Library. Selection and use of reference books and miscellaneous reference material.
- Ed10. Book Selection for the High School Library. Books examined in the fall are those chiefly of interest to the English Department.
- Ed11. Book Selection for the High School Library. Books chiefly of interest to the Social Science Department.
- Ed12. Book Selection for the High School Library. Books on science, home economics, and miscellaneous subjects.

TRADE AND INDUSTRIAL EDUCATION

- Ind110. Guidance in the Schools. The history of the guidance movement; typical public school means and methods; the presentation of occupational information; the junior wage-earning situation; attendance and child-labor laws; guidance placement and follow-up plans employed with continuation classes.

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

The Graduate School
Announcement for the Years
1925-1927



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1925							1926																
JULY							JANUARY							JULY									
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UNIVERSITY CALENDAR

1925-26

1925			
September	24-25		Registration of graduate students Physical examination for new students
September	28	Monday	Fall quarter begins, 8:30* a.m.
October	8	Thursday	Examinations in German and French for candidates for advanced degrees
November	5	Thursday	Last day for filing thesis of candidates for the fall quarter
November	7	Saturday	Last day for filing subject-matter of Master's thesis for the spring quarter
November	11	Wednesday	Armistice Day; a holiday
November	26	Thursday	Thanksgiving Day; a holiday
December	17	Thursday	Commencement Convocation
December	19	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1926			
January	4	Monday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	14	Thursday	Examinations in German and French for candidates for all advanced degrees
February	6	Saturday	Last day for filing thesis of candidates for the winter quarter
February	12	Friday	Lincoln's Birthday; a holiday
February	22	Monday	Washington's Birthday; a holiday
March	20	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	29	Monday	Spring vacation ends, spring quarter begins, 8:30* a.m.
April	2	Friday	Good Friday; a holiday
April	8	Thursday	Examinations in German and French for candidates for all advanced degrees
May	3	Monday	Last day for filing thesis of candidates for all advanced degrees
May	17	Monday	Last day for filing written examinations for candidates for all advanced degrees
May	29	Saturday	Last day for oral examinations for candidates for all advanced degrees
May	31	Monday	A holiday (for Memorial Day)
June	7	Monday	Last day for filing bond for publication of Doctor's thesis; last day for depositing binding fee for Master's degree
June	13	Sunday	Baccalaureate service

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

THE GRADUATE SCHOOL

June	12	Saturday	Spring quarter closes
June	14	Monday	Fifty-fourth annual commencement
June	21	Monday	Summer Session, first term begins
July	3	Saturday	Last day for filing thesis of candidates at summer convocation
July	31	Saturday	First term, Summer Session closes
August	2	Monday	Summer Session, second term begins
September	4	Saturday	Second term, Summer Session closes

THE GRADUATE SCHOOL

ORGANIZATION

The Graduate School has exclusive control of all graduate work carried on in the University. The graduate faculty is composed of those properly approved and qualified to offer courses carrying graduate credit. It determines the general educational policy of the Graduate School, and recommends candidates for degrees. The administration of the Graduate School is committed to the dean and an Executive Committee of seven members. They are assisted by group committees representing allied lines of work grouped together for administrative purposes. The groups are as follows:

- a. Social Sciences and Law
- b. Physical Sciences, Mathematics, and Engineering
- c. Biological Sciences
- d. Philosophy and Education
- e. Language and Literature
- f. Medicine
- g. Agriculture

ADMISSION

Any graduate holding a Bachelor's degree or its equivalent from a reputable college or university will be admitted to the Graduate School without examination, and may register for such graduate work as he may be found prepared to enter upon, but he will not thereby be admitted to candidacy for any of the higher degrees until his case has been duly considered and approved.

All inquiries concerning admission to the Graduate School should be addressed to the dean. The student is advised to obtain and fill out an application for admission before presenting himself for registration.

If the rating of the institution from which he received his first degree is such that he will need a year or more of additional work before beginning graduate work at the University of Minnesota, he is advised to enter one of the undergraduate colleges of the University and obtain the preliminary training and an acceptable Bachelor's degree.

College graduates who simply desire to take additional work of undergraduate grade without a view to preparation for an advanced degree should register as unclassified students in the college giving the work.

Advanced standing may be granted for work done in other approved graduate schools. Credits for advanced courses earned while the student is registered in an undergraduate college, even if in excess of the credits required for the baccalaureate degree, cannot be transferred to the Graduate

School. In exceptional cases, with permission of the dean of the undergraduate college concerned and of the dean of the Graduate School, undergraduates lacking not more than 9 quarter credits may be permitted to register also in the Graduate School for partial credit.

REGISTRATION

Full directions concerning registration will be found in a booklet issued by the registrar's office for the information of new students. The essential document is an official transcript of the student's college record.

FEEES

	Quarter
Tuition fee (except for clinical medicine)	\$10.00
Credit hour tuition for students carrying less than full work	1.00
Deposit (first quarter in residence)	3.00
Special deposit for Chemistry laboratory	5.00
<i>Incidental fee.</i> —An incidental fee of \$4 a quarter is charged each student for which the student receives the privileges of the Minnesota Union or Shevlin Hall, the Health Service, the <i>Minnesota Daily</i> including the Official Daily Bulletin, the University post-office service, and the <i>University Address Book</i> .	

Registration in the Graduate School includes the making out of the program and paying fees for the entire year (or for the balance of the year when registration occurs after the fall quarter).

Fees must be paid not later than one week following the approval of the registration by the dean of the Graduate School in order to avoid a \$2 penalty fee.

All the fees above mentioned apply to the regular session. For the Summer Session fees, see special bulletin.

FELLOWSHIPS AND SCHOLARSHIPS

Four graduate fellowships have been established by the late Thomas H. Shevlin, of Minneapolis. These are awarded one each in the College of Agriculture, Forestry, and Home Economics, the School of Chemistry, the Medical School, and the College of Science, Literature, and the Arts. Each fellowship yields \$500 per annum. They are awarded annually. Candidates for these fellowships should file their applications before March 1 with the dean of the Graduate School.

Shevlin fellows will devote their entire time to the graduate work for which they are registered, and may not engage in private tutoring or be required to render any service to the University.

CALEB DORR RESEARCH FELLOWSHIPS IN AGRICULTURE, FORESTRY, AND HOME ECONOMICS

By the bequest of the late Caleb Dorr of Minneapolis, the income from twenty thousand dollars is available for graduate fellowships in the Department of Agriculture of the University of Minnesota. Usually three fellowships of \$500 each will be awarded each year. The holders of these

fellowships are exempt from all tuition fees. The basis of the award is scholarship and the prospect and promise of productive research.

Caleb Dorr fellows will devote their entire time during the academic year (nine months) to the graduate work for which they are registered and may not engage in private tutoring or be required to render any service to the University.

Candidates for these fellowships should file their applications before March 1 with the dean of the Graduate School. Application blanks may be secured from the dean of the Graduate School or from the dean of the College of Agriculture, Forestry, and Home Economics.

THE DUPONT FELLOWSHIP IN CHEMISTRY

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

THE ALBERT HOWARD SCHOLARSHIP

This scholarship, founded by Mr. James T. Howard, yields \$240 annually. The holder is expected to do graduate work in Liberal Arts.

THE CLASS OF 1890 FELLOWSHIP

On the twenty-fifth anniversary of its graduation the class of 1890 founded a fellowship yielding \$200 and exemption from tuition. This fellowship is open to graduates of the colleges of Science, Literature, and the Arts, and Engineering and Architecture desiring to pursue advanced work. Applications should be filed with the dean of the Graduate School before March 1.

DEPARTMENTAL SCHOLARSHIPS

Besides the above stipends there are about seventy scholarships assigned to various departments, yielding \$225 and exemption from tuition and fees. The holders may be required to render service not to exceed ten hours a week in laboratory or office work, or not more than three hours in classroom assistance. Where these regulations are observed, a qualified holder of one of these scholarships may become a candidate for the Master's degree on the basis of one year's work in residence.

Other assistantships and teaching fellowships, some yielding as high as \$1,000 are available, but the amount of work required is greater and the length of residence of the holder of one of these appointments would be increased proportionately.

Inquiries and requests for application blanks may be addressed to the dean of the Graduate School, or to the head of the department in question.

GRADUATE WORK IN THE SUMMER

Work of graduate character done in the Summer Session of the University of Minnesota under a member of the graduate faculty may be counted for residence credit for advanced degrees. In exceptional cases, the course work for the Master's degree may be completed in four summer

sessions of six weeks each. In this case, the candidate may be permitted to carry *in absentia* thesis work to complete the equivalent of three quarters. Students working for the Master's degree in summer sessions must file the subjects of their theses before the completion of the first half of the required work. Theses of summer session students must be completed at least four weeks before the end of the session in which they take the degree.

An increasing amount of graduate work in fields of interest to high school teachers is being offered in the Summer Session. The courses for any session may be found in the bulletin of the Summer Session.

Students who desire graduate credit for work in the summer must register with the dean of the Graduate School.

GRADUATE WORK IN MEDICINE

Graduate work in the laboratory departments and in the clinical branches leading to advanced degrees is offered by the University of Minnesota. This work is under the direction of the Graduate School, and candidates for admission and degrees must meet the requirements of the Graduate School as outlined in the preceding pages. The work is offered by members of the medical faculty in Minneapolis and by members of the graduate faculty on the Mayo Foundation at Rochester, Minnesota, where part or all of the residence work may be done. Several teaching fellowships supported by the University and others on the Mayo Foundation are open to qualified students pursuing graduate work in clinical medicine or in the laboratory branches. A special bulletin on graduate work in medicine is published and may be obtained from the registrar.

WORK IN THE LAW SCHOOL

Under certain properly approved conditions graduate students may offer courses in law as a minor for an advanced degree when their major work is in the Department of Political Science or Economics.

LIBRARY METHODS

The course in Bibliographic Seminar (101-102) offered by the librarian, Frank K. Walter, is recognized for general graduate credit. With the approval of the adviser, it may be counted toward any major or minor.

REQUIREMENTS FOR THE MASTER'S DEGREE

The degree of master of arts is, in general, conferred for advanced non-technical study; the degree of master of science for advanced technical study, such as agriculture, industrial chemistry, engineering, etc.

The requirements for the degree of master of arts or master of science are covered in general by the statement that these degrees may be earned by properly qualified students only by at least one full academic year's work (three quarters) in residence at this University. Students who have

not had adequate preparation in the specific chosen field of work, or who are doing outside work in excess of ten hours a week, will require more than one year to attain the Master's degree.

Upon entrance to the Graduate School, the candidate, with the approval of the dean, will select his adviser in the field of his major work. With the approval of his adviser and the dean, he will also select a minor, and will outline a study program for the year.

Program of study.—A full program for a student who expects to meet the requirements in one academic year must cover the necessary courses in the fields of the major and minor and the preparation of a satisfactory thesis. The work must be selected from graduate courses offered in this bulletin and must amount to not less than 6 or more than 9 credit hours each quarter. In addition, thesis work (or courses upon which the thesis is based) should be carried to make a total of not less than 15 hours per week for three quarters. In general, 9 quarter credits in the minor and 18 quarter credits in the major, in addition to the thesis (or courses upon which the thesis is based), is regarded as the normal program for the Master's degree. A grade not less than B must be obtained in any course offered as fulfilling the requirement in the major. A grade not less than C must be obtained in minor courses.

The major.—The major work must be in a department in which the candidate has had at least three years of work (18 semester or 27 quarter credits) if it be a department open to freshmen, or two years of work (12 semester or 18 quarter credits) if it be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses in the same or allied departments. Any special requirements will be noted in the corresponding departmental statement. At the end of the year, a final written examination (in addition to the usual course examinations) will be given in the major as noted below.

The minor.—The minor subject must be selected in a department in which the candidate has had at least one year's work (6 semester or 9 quarter credits), or he must have had in a closely allied department a year's work (6 semester or 9 quarter credits), which is actually designated as a prerequisite to the minor subject. Any special requirements will be noted in the corresponding departmental statements.

The choice of the minor must be in a department whose work can be logically related to that of the department in which the student is doing his major work. The dean and the group committee may in exceptional cases allow the minor subject to be taken in the same department as that of the major.

The language requirement.—A reading knowledge of a foreign language, modern or ancient, the language to be determined by the major department, is required of candidates for the Master's degree, unless exemption is made in individual cases with the approval of the Executive Committee of the Graduate School. When no other statement is made in the departmental announcement in this bulletin, a knowledge of either French or German is expected. The candidate shall present to the dean

of the Graduate School, not later than the close of the second quarter of residence, a certificate of proficiency in the designated language, signed by the professor in charge of the corresponding language department or his representative.

Candidates for the Master's degree in any department in the language and literature group who register after September 1, 1922, will be required to have a reading knowledge of two foreign languages before they are recommended for the degree.

All examinations to meet the language requirement of the Graduate School, unless otherwise arranged with the language departments, shall be held on the days specified in the calendar at the beginning of this bulletin.

A candidate who fails in a language examination for an advanced degree shall not be given a second examination until the following quarter.

The Master's thesis.—Before the middle of the first quarter in residence the candidate should file at the office of the Graduate School the subject of his thesis. This subject must be approved by his adviser and by the corresponding group committee. It should be on a topic falling within the field of the major. The candidate will ordinarily devote approximately one half his time to the preparation of the thesis, including courses on which the thesis is based. The thesis must be written in acceptable English and show ability to work independently, and give evidence of power of independent thought both in perceiving problems and making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

The thesis is required to be in triplicate in order to facilitate its consideration. Two copies are retained for the University Library (as noted below), the third copy being finally returned to the candidate. Since one copy is usually desired by the adviser or department concerned, a fourth copy should be provided for this purpose. One copy must be upon the specially required linen stock and the others may be carbon copies on cheap paper. Samples in the dean's office of both the linen stock and carbon paper should be examined before the thesis is typewritten. The body of the thesis should be double spaced, but footnotes may be single spaced.

The thesis must be finished and three copies deposited in the office of the dean of the Graduate School at least six weeks before the candidate presents himself for his degree.

The thesis will be examined by a committee of three, appointed by the dean on the recommendation of the group committee. The student's adviser will, as a rule, be the chairman of this committee. Unanimous approval by this committee will be necessary for the acceptance of the thesis.

If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement the sum of one dollar and fifty cents for binding one copy of this thesis, which will be cataloged and deposited in the University Library. This copy cannot be taken from the library. The second copy, however, may be borrowed from the library.

Examinations.—All candidates for this degree will meet the regular requirements as to examinations, topics, reports, etc., of the classes in which they are registered. A special examination in the field of the minor is not required, but this does not excuse the candidate from the regular course examinations. Besides the usual course examinations, where such are given, the candidate for the Master's degree must pass a final written examination in the major and after the acceptance of the thesis, a final oral examination.

The final written examination will be held not later than four weeks before the end of the quarter in which he takes his degree. It will cover the work of the candidate in the field of the major, and may include any work fundamental thereto. This examination will be held by his instructors in the major department, the adviser acting as chairman.

If the final written examination is satisfactory, and the thesis accepted, the final oral examination of the candidate will be held, not later than two weeks before the end of the quarter in which he takes his degree. The adviser will act as chairman of the examining committee, which will include all the instructors with whom the candidate has taken work, the thesis committee, and, ex-officio, the head or chairman of the department in which the major work is done. Any member of the graduate faculty may attend as a visitor, and due notice shall be sent by the chairman of the committee to all members of the graduate faculty in the major and minor departments. The final oral examination will cover all the work offered for the degree, and may include other work fundamental thereto. At the close of the examination, the committee will vote upon the candidate, taking into account all of his work. A majority vote is required for approval.

TABULAR SUMMARY OF REQUIREMENTS FOR
THE MASTER'S DEGREE

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School	On entrance
Approval of thesis subject	Adviser and group committee	Middle of first quarter in residence
Language requirement	Adviser and language department	Before close of second quarter
Approval of candidacy ...	Executive committee	Beginning of third quarter
Filing of thesis	Dean of the Graduate School	At least six weeks before graduation
Examination of thesis	Thesis committee	Before admission to final oral examination
Final written examination in major	Major department members of the graduate faculty	Not later than four weeks before commencement and before final oral examination
Final oral examination on all work	Thesis committee; all candidate's instructors; head of major department ...	Not later than two weeks before commencement
(Course examinations as required at the usual times.)		
Fee for binding thesis ...	Registrar	One week before commencement

Candidates who are eligible for the "preliminary examination" for the Doctor's degree may substitute this examination for the final oral examination for the Master's degree, provided that all other requirements for the preliminary examination (see p. 17) have been met.

Reports.—Special blanks are provided for signed reports concerning the thesis and the final oral examinations. All reports must be filed in the office of the dean of the Graduate School at least one week before the end of the last quarter.

Candidates meeting the requirements as above outlined will be reported by the dean to the executive committee of the graduate faculty, who will by vote recommend to the Board of Regents those approved for degrees.

Candidates upon whom degrees are to be conferred are required to be present at commencement, unless especially excused by the dean of the Graduate School and the president of the University.

MASTER OF SCIENCE IN ENGINEERING OR ARCHITECTURE

The requirements and procedure for the degree of master of science in civil, mechanical, electrical, chemical, or architectural engineering or architecture will correspond to those outlined for this degree in other subjects. The major subject and thesis will lie in the field represented by the degree. The thesis will be filed and final written examination taken at least six weeks before graduation. The language requirement will be waived in all of these cases except chemical engineering, in which German is required.

THE ENGINEER DEGREES

Requirements.—The advanced professional degrees, civil engineer, mechanical engineer, electrical engineer, chemical engineer, and architectural engineer will be conferred upon the recommendation of the Graduate School faculty as a result of the satisfactory completion of the following requirements:

a. A Bachelor's degree, from an approved school in the corresponding branch of engineering.

b. One full academic year of graduate engineering study (three quarters) in residence at this University. Graduates of this University may be permitted to carry on this study *in absentia* under the direction of the faculty. Work done *in absentia* may not be substituted for the residence work required for the master of science.

c. Four years of engineering experience in positions of responsibility, subsequent to receiving the Bachelor's degree. (If the graduate study is done *in absentia*, five years of experience are required.)

d. A thesis of professional grade.

Candidates for the degree of chemical engineer must have a reading knowledge of German.

For graduates of this University, a Master's degree in the corresponding branch of engineering will be accepted as fulfilling the requirements of the year of graduate study.

The Engineer degree will not be granted in less than five years after the Bachelor's degree was received.

If the Bachelor's degree is in another branch of engineering than that in which the professional degree is sought, the student must complete the equivalent of the subjects required for the Bachelor's degree in the new field before admission to candidacy for the desired degree.

The Master's degree with the Engineer degree.—It is recommended that the student who is entering upon the graduate year's study in residence for the Engineer degree register for and obtain the Master's degree for this year's work, that is, the degree of master of science in the corresponding branch of engineering. The essential difference lies in the requirement of a thesis if the Master's degree is sought. However, the aggregate amount of work is intended to be the same in both cases, namely, from 15 to 18 credit hours per week for the three quarters. If the graduate study does not lead to the Master's degree, the student is not required to prepare a thesis as a part of the year's work. The Master's thesis, however, will not satisfy the requirement for the professional thesis which is intended to be related to the practical experience after the Bachelor's degree was received.

Plan of study.—Upon entrance to the Graduate School, the candidate, with the approval of the dean, will select his adviser in the field represented by the desired degree, in which field the major work and the thesis, if one be taken, will lie. With the approval of his adviser and the dean, he will also select a minor, and will outline a study program for the year.

If the student registers for the Master's degree in engineering or architecture, he will conform to the requirements for that degree as regards major and minor work, thesis, examinations, etc.

If the graduate study during the year of residence or *in absentia* is towards the Engineer's degree only, it will be divided into major and minor work, of which the major will usually constitute about two thirds and the minor one third of the total of 15 to 18 credit hours which will be carried each quarter.

Study in absentia.—Only graduates of this University will be permitted to undertake the graduate study *in absentia* towards one of the Engineer degrees. This permission must be obtained from the head of the department represented by the degree, who will usually act as the adviser, and from the dean of the Graduate School. It is not necessary that this study be coincident with the academic year; it may be undertaken at any time.

The proposed plan of study should be arranged with the approval of the adviser. The tuition fee of ten dollars per quarter will be charged for three quarters only, altho the study may, and generally will, extend over more than nine months. At least 1,500 actual hours of work should be performed as the equivalent of a year's study in residence.

The detailed requirements of reports and examinations will be established by the adviser. A separate written report must be submitted at the end of each quarter's work. A written examination covering the

entire study, both major and minor, will be held at the close of the year's work. Under favorable circumstances this examination may be held in the place where the candidate resides.

Upon the satisfactory completion of the year's work, the proper credits will be recorded towards the engineering degree.

Study in residence.—The work will consist of regular courses offered in this bulletin and may include research if desired by the student, even tho the Master's degree be not sought.

Thesis.—At least six months before the Engineer degree is expected, the thesis subject must be approved by the adviser and the group committee. The thesis itself must be filed with the dean at least six weeks before the commencement at which the degree is to be obtained together with a deposit of one dollar and fifty cents to cover binding the thesis.

Statement of experience.—With the thesis, the candidate must file a detailed statement of his professional experience since receiving his Bachelor's degree. This should amount to at least four years, if the graduate study was in residence, or five if *in absentia*.

TABULAR SUMMARY OF REQUIREMENTS FOR
THE ENGINEER'S DEGREE

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School	On registration
Quarterly reports if in absentia	Adviser	
Written examination	Adviser and major and minor staff	At end of year's study or later, as arranged
Thesis subject	Adviser and group committee	Six months before graduation
Experience statement	Adviser and major staff...	Six weeks before graduation
Filing thesis	Dean of Graduate School.	Six weeks before graduation
Fee for binding thesis...	Registrar	One week before graduation

Attendance at commencement.—Unless specifically excused for an important reason, the candidate will be present in person to receive the degree.

DOCTOR'S DEGREE

In the Graduate School, one Doctor's degree, doctor of philosophy (Ph.D.), is conferred by the University of Minnesota. This degree is granted, not on the basis of successful completion of a definite amount of prescribed work but chiefly in recognition of the candidate's high attainments and ability in this special field, to be shown, first, by the preparation of a thesis, and second, by successfully passing the required examinations covering both the general and the special fields of the candidate's subjects as detailed later.

Candidates for the Doctor's degree must devote at least three years¹ of graduate study to approved subjects. The first two years or the last year must be spent in residence at the University of Minnesota.

A member of the staff of instruction above the rank of instructor will not be permitted to enroll for a Doctor's degree at this University. There is no objection, however, to his registering for graduate work at this University and credit so obtained may be presented elsewhere.

PROGRAM OF WORK

First year.—Upon entrance to the Graduate School, the student shall select his adviser with the approval of the dean. With the approval of his adviser he shall submit to the dean a program covering his first year's work.

Second and third years.—Before beginning the work of the second year, the student shall submit to his adviser and the group committee for approval a tentative outline of his work for the second and third years, including both the major and minor subjects. This program is then to be submitted to the dean for final approval. During the second quarter of the second year he shall file with his adviser's approval the subject of his Doctor's dissertation.

Language requirements.—Before admission to the preliminary examination, the student must present to the dean of the Graduate School statements from the French and German departments, certifying that the applicant has a reading knowledge of those languages. The substitution of other foreign languages of greater service in the major field may be permitted by the executive committee on recommendation of the group committee. In addition, a knowledge of other languages may be required in certain cases, as the candidate's major department may prescribe. The student's adviser or his representative shall attend the language examinations and provide literature in the major field from which the test passages are selected. For the dates of these language examinations consult the calendar at the beginning of this bulletin.

THE MAJOR WORK

The major work must be in a department in which the candidate has had, in his undergraduate study, at least the equivalent of three years of work (18 semester or 27 quarter credits) if it be a department open to freshmen, or two years of work (12 semester or 18 quarter credits) if it be a department not open to freshmen. Part or all of this preliminary work may consist of designated prerequisite courses in the same or allied departments.

¹ This time requirement will be met in three years only by those students who devote all their time to graduate study. Students who merely devote the intervals of professional or other regular employment to graduate study will need to extend their total period of work over a longer period of time. Credit for such work will be given in proportion to the amount of time actually spent in the pursuit of graduate work.

During the period of work for the Doctor's degree a student shall spend not less than two thirds of his time¹ on the major subject, including the work on the thesis. During the last two years, he shall carry an average of at least one course per quarter in his major outside the work from which this thesis is developed.

At the close of the second year's work, and before admission to the preliminary examination, the student must obtain the written recommendation of the major department members of the graduate faculty. Such written recommendations should state that in view of the work already done by the applicant, the department is convinced of his probable capacity and ability to meet all the requirements for the degree, including the thesis, the subject of which must be stated.

In the case of a student who comes for the last year of residence only, provision for the examination will be made by the dean and the major department.

THE MINOR WORK

The minor work must be selected in a department in which the student is prepared to pursue courses advanced enough in character to be included in the group designated "For Undergraduate and Graduate Students," and numbered 100 or above.

The choice of the minor must be in a department the work of which can be logically related to that of the department in which the student is doing his major work.

In exceptional cases, the dean and the group committee may allow the minor subject to be taken in the same department as that of the major or in two related departments.

Not less than one sixth of the total work of the three years shall be devoted to the minor subjects and all of this work shall be completed and certified to by the department in which the minor is taken before admission to the preliminary examination.

THESIS

The thesis, for which the accumulation of material may well be started not later than the beginning of the second year, must give evidence of originality and power of independent investigation, and embody results of research, which form a real contribution to knowledge as well as exhibit mastery of the literature of the subject and familiarity with the sources of knowledge. The matter must be presented with a fair degree of literary skill.

Not later than six weeks before the commencement at which he expects to take the degree, the student shall deposit at the dean's office his thesis, typewritten, in triplicate copy to facilitate reading by the thesis committee. The requirements concerning form, copyrighting, and printing adopted in June, 1922, may be consulted in the Graduate School office.

The dean will appoint a thesis committee, of which the student's adviser will usually be the chairman. The duty of this committee will be to read

¹ In estimating the distribution of time, a week of 15 credit hours may be assumed.

the thesis and vote upon its acceptance. Unanimous approval by this committee will be necessary to such acceptance.

Printing of the thesis.—If the thesis be accepted, the student shall deposit with the registrar, not later than one week before graduation, a sufficient bond or such sum of money as is needed to print one hundred copies of the thesis for the use of the University and as many additional copies as the candidate may require for himself. If the thesis is to be published elsewhere, reprints will be acceptable, if bound with covers in the special form required by the University.

EXAMINATIONS

Preliminary.—After the language examination (see p. 15) and at least seven months before the degree is conferred, a preliminary examination of the student shall be given by a committee appointed by the dean and including the student's adviser as chairman, a representative of the group committee other than his adviser, the chairman or head of the major department, a representative of the minor department, and such other members as the dean may consider advisable. Certificates of proficiency in French and German and completion of the minor and the recommendation of the major department shall be required before admission to this examination. The examination shall cover graduate work previously taken by the student, and *may include any work fundamental thereto*, except the thesis and the field of definite specialization. This examination shall be in addition to the usual course examinations. It may be written or oral, or both, at the discretion of the committee. Only after the successful completion of this examination may the student be enrolled as a candidate for the Doctor's degree. Students failing to pass this preliminary examination may be excluded from candidacy for the degree and in any case shall not be re-examined until at least one quarter has passed.

Final written.—After the thesis is presented, and at least four weeks before examination, there shall be a written examination in the major subject, to be given by the members of the graduate faculty in the major department. This examination shall cover all the work done in the major, and *may include any work fundamental thereto*.

Final oral.—After successful completion of the written examination and acceptance of the thesis and not less than two weeks before graduation, the final oral examination shall be given. This examination shall be conducted by a committee consisting of the adviser as chairman, of a majority of the members of the graduate faculty of the department in which the major work was done and at least three other members of the graduate faculty appointed by the dean. At least one member of this committee shall be from a group other than the one in which the major department is included. This examination has special reference to the thesis and the field of the candidate's special studies and shall not exceed three hours.

The date of the final oral examination shall be publicly announced and the examination shall be open to any member of the graduate faculty. Upon completion of the examination, a formal vote of the committee shall be taken, and an affirmative vote of at least two thirds of the members shall be necessary for recommendation of the candidate for the degree.

Reports.—Special blanks are provided for signed reports concerning the thesis and the final oral examinations. All reports must be filed in the office of the dean of the Graduate School at least one week before graduation.

Candidates meeting the requirements as above outlined will be reported by the dean to the executive committee of the graduate faculty, who will by vote recommend to the Board of Regents those approved for degrees.

Candidates upon whom degrees are to be conferred are required to be present at commencement, unless especially excused by the dean of the Graduate School and the president of the University.

TABULAR SUMMARY OF REQUIREMENTS FOR
THE DOCTOR'S DEGREE

WORK	UNDER THE DIRECTION OF	DATE
FIRST YEAR		
Major	Adviser and dean of the Graduate School	On registration
Minor		
SECOND YEAR		
Tentative program of entire second and third year's work	Adviser, group committee, and dean of Graduate School	Before beginning work of second year
Major, including thesis ..	As for tentative program	} Before admission to preliminary examination
Minor	Adviser and minor department	
Language	Adviser and language department	
Recommendation	By major department ...	
Preliminary examination .	Special committee	Seven months before degree is to be conferred
THIRD YEAR		
Major, including thesis ..	Advisers, group committee, and dean of Graduate School	} Six weeks before taking the degree
Filing of thesis	Dean	
Examination of thesis	Thesis committee	Before admission to final oral examination
Final written examination	Major department members of the graduate faculty	Four weeks before taking degree and before final oral examination
Final oral examination ...	Advisers, majority of members of major department, and other members appointed by dean of Graduate School	Not later than two weeks before taking the degree
Bond for publication of thesis	Registrar	Not later than one week before taking the degree

DESCRIPTION OF COURSES

EXPLANATIONS

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

AGRICULTURAL BIOCHEMISTRY

Professors Ross Aiken Gortner, Clyde H. Bailey, Leroy S. Palmer; Associate Professor John J. Willaman; Assistant Professors Walter F. Hoffman, Cornelia Kennedy, Clarence A. Morrow.

Prerequisites.—For major work, credit in general chemistry and qualitative analysis, in organic chemistry, in quantitative analysis, and at least ten quarter credits in biological science. The work presented as prerequisite must be satisfactory to the instructor with whom the student wishes to work.

For minor work, credit in general chemistry and qualitative analysis, in organic chemistry, and 10 quarter credits of biological science. Minors should be arranged only after consultation with the instructors concerned.

All students majoring in this division and all minoring for the Doctor's degree must include either Course 201 or 202 in their study programs.

Candidates for the Master's degree must have a reading knowledge of German or French. (In special cases, where other languages are needed for the development of the thesis, Russian, Italian, or the Scandinavian languages may be substituted.)

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w. Agricultural Quantitative Analysis. Includes estimation of inorganic and organic constituents of biological products, proximate analysis of foods and feeding stuffs, and the use of special apparatus. Prerequisite: quantitative analysis. Three credits each quarter. MWF VI, VII, VIII; 7Ch. Mr. Morrow.
- 103s. Dairy Chemistry. Lectures and laboratory work on the physical, colloidal, and chemical properties of milk and dairy products, and of the processes involved in the manufacture of dairy products. Five credits. Lect. MWF VI; Lab. MWF VII, VIII, IX; 7Ch. Mr. Palmer.
- 108s. 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 its conversion into food. Prerequisite: organic chemistry. Three credits. MWF I; 201Ch. Mr. Bailey.
- 109s. Selected Flour Laboratory Methods. A laboratory course in which particular attention is given to recently developed methods for testing wheat products. Less extensive than 110. Designed for men with commercial laboratory experience. Prerequisite: Course 101-102 or Chemistry 131-132, parallel 108. Three credits. MW VI, VII, VIII, IX; 7Ch. Mr. Bailey.

- 110s. Flour Laboratory Methods. A laboratory course. Analysis of wheat and its products. Designed to train students for research in the cereal industry. Prerequisites: Course 101-102 or food analysis. Five credits. MWF VI, VII, VIII, IX; 7Ch. Mr. Bailey.
- 111f,su-112w,su. Phytochemistry. An advanced course dealing with the colloidal state, and the chemistry of proteins, carbohydrates, glucosides, tannins, fats, plant acids, enzymes and pigments, and their physico-chemical relations to the vital processes involved in growth and nutrition. Prerequisites: organic chemistry, biology, 1 year. Three credits each quarter. Lect. MWF III; Rec. Th VI; 201Ch. Mr. Gortner.
- 113f,su-114w,su-115s. Biochemical Laboratory Methods. A laboratory course paralleling the lectures in 111-112. Prerequisite: quantitative analysis, parallel 111-112. Two credits each quarter. T VI, VII, VIII; Th VII, VIII, IX; 7Ch. Mr. Morrow.
- 116w. Advanced Animal Nutrition. Recent developments in animal nutrition, covering the field of proteins, mineral metabolism, vitamins, and the relation of nutrition to disease. Prerequisite: Course 15 or equivalent. Two credits. TTh III; 351Ch. Mr. Palmer, Miss Kennedy.
- 117f,w,s. Laboratory Problems in Animal Nutrition. A laboratory course on methods used in nutrition studies. (Because of limited laboratory facilities, students planning to register for this course should obtain permission from the instructors before registration.) Prerequisite: Course 116. Three to 5 credits. Ar. Miss Kennedy.
- 118f,w,s,su. Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds, and in special methods of identification or determination of biochemical products. Prerequisites: Courses 111-112, 113-114; or 103 or 110. Three or 5 credits. Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman, Miss Kennedy, Mr. Morrow.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f,w,s. Seminar in Plant Chemistry, Colloids and Proteins. One credit. Ar. Mr. Gortner, Mr. Bailey, Mr. Willaman.
- 202f,w,s. Seminar in Nutrition and Dairy Chemistry. One credit. Ar. Mr. Palmer, Miss Kennedy.
- 203f,w,s,su. Research Problems. Special work on particular research problems other than the student's major thesis. Facilities are provided for biochemical investigations and for advanced studies in plant, animal, or human nutrition. Three or 5 credits. Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman, Mr. Morrow.
- 205f,w,s,su. Special Topics in Biochemical Literature. Library work followed by the preparation of written reports upon either the historical development or the current literature of special biochemical problems. A reading knowledge of German is necessary and of French desirable. Prerequisite: Course 206, 207, or 208. Three credits. Mr. Gortner, Mr. Bailey

- 206f. Colloids. Lectures dealing with the colloidal state, the preparation and properties of colloidal solutions, and the relation of these to biochemical processes. Prerequisite: Course 111-112, or physical chemistry. Three credits. MWF II; 351Ch. Mr. Gortner.
- 207f. Enzymes.¹ 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; 351Ch. Mr. Willaman.
- 208w. Proteins.¹ Lectures on the composition, structure, biochemical reactions, and functions of the protein and amino acids with special emphasis upon those which are concerned in plant growth and metabolism, animal food, and industrial processes. Prerequisite: Course 111-112, or advanced organic chemistry. Three credits. MWF II; 351Ch. Mr. Gortner.
- 209w. Carbohydrates.² A lecture and library course on the synthesis, structure, reactions, and functions of carbohydrates, with especial reference to those which are of plant or animal origin and which play a rôle in biochemical or industrial processes. Prerequisite: Course 111-112, or advanced organic chemistry. Three credits. TThS II; 351Ch. Mr. Willaman.
- 212f,w,s. Special Topics in Nutritional Chemistry. A course comprising lectures, independent library study, and oral presentation by students, of special assigned topics in animal nutrition. A reading knowledge of German is essential and French desirable. Prerequisite: Course 116. Three credits. Mr. Palmer.

AGRONOMY AND FARM MANAGEMENT

Professors Andrew Boss, Herbert K. Hayes; Associate Professors Albert C. Army, George A. Pond, Fred Griffec.

Prerequisites.—In agronomy, for major work, Courses 121, 122, 131, 132, or their equivalents, and a reading knowledge of German or French. For minor work, two years of botany, one year of zoology, and the elementary courses in farm crops.

In farm management, for major work, Courses 102, 103, and 104, or their equivalents, and at least 6 credits in elementary and agricultural economics. For minor work, at least 12 credits in the elementary agricultural sciences (Farm Crops 1, Soils 4, and Animal Husbandry 3-4). Exemption from the language requirement for the Master's degree may be made in individual cases.

In plant-breeding, for major work, Courses 121, 122, 131, 132, or their equivalents, and a reading knowledge of German or French. With the approval of the adviser, courses in agricultural biochemistry, botany, farm crops, horticulture, plant pathology, and plant physiology, may be accepted

¹ Offered in alternate years, will be offered in 1925-26.

² Offered in alternate years, not offered in 1925-26.

as major work. For minor work, two years of botany, one year of zoology, and the elementary courses in farm crops. Students majoring in plant breeding are required to continue study during at least one summer. Exemption is made if similar training has been obtained at some other institution.

COURSES IN AGRONOMY

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 121f. Cereal Crops. An advanced study of the cereal crops. Structure, group classification, improvement, growing, and utilization. Brief score card practice and a limited amount of placing on intrinsic value included. Prerequisites: Course I; botany, 10 credits. Three credits. TTh VI, VII; 2Ad(F). Mr. Army.
- 122w. Corn and Potato Crops. A study of the corn and potato crops similar to that outlined for cereal crops. Prerequisites: Course I; botany, 10 credits. Three credits. TTh V, VI, VII; 2Ad(F). Mr. Army.
- 123s. Forage and Fiber Crops. A study of the forage crops through assigned reading, laboratory and field work. Prerequisites: Course I; botany, 10 credits. Three credits. TTh V, VI, VII; 2Ad(F). Mr. Army.
- 124su. Advanced Farm Crops. This course includes a survey of modern farm practices and emphasizes the application of recent discoveries in plant science to crop production problems. It is especially designed to meet the needs of instructors in Smith-Hughes schools. Senior, graduate. Prerequisites: Courses 121, 122, 123, or equivalent. Three credits. MTWThF I, II; 2Ad(F). Mr. Steinmetz.
- 133w. Judging and Grading Farm Crops. Prerequisites: Courses 1, 121, 122. Course 122 may be concurrent. Three credits. TTh VIII; 2Ad(F). Mr. Army.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201Ar. Research in Farm Crops. It is desirable that students remain during one summer to work out research problems. Prerequisites: 9 credits in farm crops. Mr. Army.
- 202f,w. Farm Crops Seminar. Weekly meetings for the discussion of current literature and for reports of thesis problems. Prerequisites: 9 credits in farm crops. Maximum of three credits. Mr. Army.
- 203Ar. Special Topics in Farm Crops Literature. Technique in conducting experimental work and interpreting results. Library work, including the making of abstracts, reviews, and bibliographies. Prerequisites: Courses 121, 122, 123, and a reading knowledge of German. Maximum of six credits. Mr. Army.
- 204su. Classification and History of Crop Plants. Assignments, discussions, and laboratory work covering (a) a study of crop plants and related wild forms with their distribution, followed by (b) a study of the characteristics of species and varieties of crop plants which are useful in identification and systematic classification. The materials necessary

to make the classifications are available. Senior, graduate. Prerequisites: Courses 121, 122, 123; Botany 4, 5, 6. Three credits. MWF I, II; 2Ad(F). Mr. Army.

COURSES IN FARM MANAGEMENT

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102f,w,s. Farm Management: Organization. The business side of farming and farm organization and equipment is emphasized. Prerequisites: Course 1; Agricultural Economics 1; Soils 4. Three credits. MWF II; 24Ad(F). Mr. Boss, Mr. Garey.
- 103w,s. Farm Management: Operation. A continuation of Course 102 with special attention to farm operation. Prerequisites: same as above with Course 102. Three credits. MWF I; 24Ad(F). Mr. Boss, Mr. Garey.
- 104s. Farm Management. A methods course, covering cost of production studies, farm business analysis, farm practice and farm management literature. Prerequisites: Courses 102 and 103. Three credits. MWF II; 18Ad(F). Mr. Boss.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 220f. Farm Management Surveys. Special and intensive work in studying the various factors entering into farm organization. Prerequisites: 9 credits in Farm Management. Three credits. Ar. Mr. Boss, Mr. Garey.
- 221w. Farm Organization Studies. A seminar study of the principles involved in the analysis of farm organization data and the computation of farm costs. Attention will be given to methods used in collecting and compiling these data with special emphasis on farm records and accounts as a basis for farm organization study. Prerequisites: 9 credits in Farm Management. Three credits. Mr. Pond.
- 222Ar. Problems in Farm Record Analysis. A laboratory study of methods of recording and analyzing the farm business. Prerequisites: 9 credits in Farm Management. Mr. Pond.
- 223Ar. Systems of Farming. A seminar course, including an intensive study of the factors determining the various systems of farming and production areas, with emphasis on specific types of farming. Prerequisites: 9 credits in Farm Management, Agricultural Economics 7, or equivalent. Three to six credits. Mr. Boss, Mr. Pond, Mr. Garey.
- 224w,225s. Advanced Farm Organization. Analysis of farm organization and the application of survey factors and cost factors in organizing the business of farming. Prerequisites: 12 credits in Farm Management. Three to six credits. Ar. Mr. Boss.

COURSES IN PLANT-BREEDING

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131f,w. Principles of Genetics. Given in co-operation with the Division of Horticulture. Designed to familiarize students with underlying principles of breeding. Prerequisites: botany, 10 credits; or animal biology,

- 10 credits. Three credits. ThS I; T I, II; 24Ad(F). Mr. Aamodt, Mr. Beaumont.
- 132s,su. Farm Crops Plant-Breeding. Applied genetics is emphasized. Prerequisite: Course 131. Three credits. ThS I; T I, II; 4Ad(F). Mr. Griffiee.
- 134f,w. Laboratory Problems in Genetics. Methods of taking and arranging genetics data. Special inheritance problems with *Drosophila*. Two credits. Mr. Brewbaker.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 241Ar. Research in Plant-Breeding. Special problems in plant-breeding technique, inheritance of plant characters, and cytological studies in relation to plant genetics. May be taken as major or minor work. Prerequisites: Courses 131, 132. Mr. Hayes.
- 242f,s. Plant-Breeding Seminar. History, plant genetics in relation to plant-breeding, and a discussion of research problems. Weekly meetings. Prerequisite: Course 131. One credit per quarter. Mr. Hayes.
- 243f. Methods in Plant-Breeding. Emphasis is given to field plot technique, the results of inbreeding and outbreeding, and the results of selection and crossing as a means of improving crop plants. Practice in outlining the correct mode of attack for special plant-breeding problems. Prerequisite: Course 132. Three credits. Mr. Hayes.
- 244su. Laboratory Methods in Plant-Breeding. Supplementing 243f. Practice in field laboratory technique, methods of controlling pollination and handling of plant cultures. Prerequisites: Courses 131, 132. Three credits.
- 245w. Advanced Genetics. Current genetic literature. Linkage, genetic stability, chromosomal aberrations, and the probable errors of Mendelian ratios will be emphasized. Prerequisite: Course 131. Three credits. Mr. Hayes.
- 246w. Genetics Seminar. Important recent contributions to genetic theory and practice. Prerequisite: Course 131. Prerequisite or parallel: Course 245. Two credits. Mr. Hayes.

ANATOMY

Prerequisites.—The Institute of Anatomy offers excellent facilities to students who wish to take advanced work or to pursue investigations in anatomy.

The prerequisite work for all students for major or minor in the Department of Anatomy includes general zoology (animal biology), 6 credits, and advanced zoology or elementary courses in anatomy (including histology, embryology, and neurology), 6 credits. In addition each student desiring a major in anatomy must have had the elementary courses in that branch of anatomy in which he desires to specialize—gross anatomy, histology, embryology, or neurology.

For staff and the description of courses, see the special bulletin on graduate work in medicine.

ANIMAL BIOLOGY

Professors William A. Riley, Royal N. Chapman, Hal Downey, John B. Johnston, Arthur G. Ruggles, Charles P. Sigerfoos; Associate Professors Dwight E. Minnich, Elmer J. Lund; Assistant Professor Oscar W. Oestlund.

Prerequisites.—For major work, Course 1-2 and at least 18 credits of advanced work approved by the department; for minor work, Course 1-2 or the equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107s. Protozoology. Lectures, references, and laboratory work on the structure and life histories of Protozoa. Three credits. MWF I, II; 211,213AB. Mr. Sigerfoos.
- 108s. Experimental Zoology. An experimental study of cells and lower organisms with reference to their behavior. Lectures, laboratory, and reading. Ar. Mr. Minnich.
- 109f,110w,111s. General Physiology. A thoro survey of fundamental physiological processes in organisms. Based on Bayliss's *Principles of General Physiology*. Laboratory, lectures, and reading. Fifteen credits. MWF V-VIII; 10AB. Mr. Lund.
- 117f-118w-119s.† Ecology of Insects. General principles of ecology with special reference to the insects of Minnesota. Lectures, laboratory, assigned reading, and field work. Nine credits. TTh V-VII; 202AB. Mr. Chapman.
- 124su. Advanced Ecology. Similar to Course 117-118-119 with special field work. Five credits. Ar. 202AB. Mr. Chapman. (Not offered in 1925 and 1926.)
- 125f-126w-127s.† Advanced Entomology. Morphology and classification of insects, with lectures on the history of entomology. Nine credits. TThS III, IV; 204AB. Mr. Oestlund.
- 130w. Biology and Taxonomy of the Aphididae. Intensive study of the natural history, bibliography, and classification of the Aphididae. Three credits. MWF III, IV; 204AB.
- 139-140.† Histology and Development of Insects. Lectures and laboratory work on the histology, embryonic and postembryonic development of insects. Six credits. T II, III, IV and ar.; 324AD(F). Mr. Riley.
- 144f-145w-146s. Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism; the structure, life history, and economic relations of representative parasites. Second term devoted primarily to the relation of insects to diseases of man and animals. Nine credits. WF V-VII; 202AB. Mr. Riley.
- 181f-182w.† General Embryology. Principles and laws of animal development in connection with origin and development of germ cells, sex chromosomes, fertilization, cleavage, etc. Six credits. MWF V, VI; 201,211AB.

- 183.† Genetics and Eugenics. Facts and theories of heredity and the application of the laws governing natural inheritance for the improvement of the race. Three credits. MWF IV; 211AB.
- 187w. Seminar. Reading and discussion covering philosophical aspects of zoology. Admission by consent of the instructor. Mr. Minnich.
- 197f-198w-199s. Problems. Advanced work in some special line. Nine or 18 credits. Hours and days arranged. Mr. Riley, Mr. Downey, Mr. Johnston, Mr. Sigerfoos, Mr. Lund, Mr. Chapman, Mr. Minnich, Mr. Oestlund.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. Research in Entomology. Hours and days arranged. Mr. Riley, Mr. Chapman, Mr. Oestlund, Mr. Graham.
- 205-208. Research in Economic Entomology. Mr. Ruggles, Mr. Graham.
- 209-212. Research in Economic Vertebrate Zoology.
- 213-216. Research in Biological Oxidations. Mr. Lund.
- 217-218-219. Research in the Physiology of the Lower Organisms with Special Reference to the Protozoa. Mr. Lund.
- 229-232. Research in Animal Histology. Mr. Downey.
- 233-236. Research in Vertebrate Connective Tissue with Special Reference to the Cellular Elements. Mr. Downey.
- 237-238. Research in Vertebrate Hematology. Mr. Downey.
- 245-248. Comparative Neurology. A study in the structure and functions of the nervous system of vertebrate animals and of the evolution of the chief nervous mechanisms. Prerequisites: two years in comparative or human anatomy. Mr. Johnston.
- 249-252. Research in Neurology. Mr. Johnston.
- 253-254. Dynamics of Protoplasm and Cells. Physical and chemical interpretation of the structure of living protoplasm, and vital processes such as permeability, secretion, enzyme action, regeneration, stimulation, and energy transformation in the living cell. Research accompanied by lectures. Mr. Lund.
- 257-260. Sensory Physiology of Invertebrates. Mr. Minnich.
- 261-264. Research in Parasitology and Medical Entomology. Mr. Riley.
- 265-268. Research in Insecticides.

ANIMAL HUSBANDRY

Professors Walter H. Peters, Evan F. Ferrin, Henry W. Vaughan; Assistant Professor Phillip A. Anderson.

Prerequisite.—Students majoring in this division are exempted from the language requirement for the Master's degree.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Advanced Livestock-Judging. Three credits. MWF VI, VII; center arena, St(F). Mr. Ferrin.

- 102s. Horse Husbandry. Stud farm management; the selection of foundation stock and the breeding, feeding, and marketing of horses. Horsepower; factors determining a horse's efficiency for work. Three credits. TTh II; 3Sh(F) and F V, VI, VII; center St(F). Mr. Peters.
- 103s. Beef Cattle Husbandry. The management of purebred and grade herds of beef cattle, sales and shows, building equipment, labor, with practical exercises. Three credits. MW III; 3St(F) and T V, VI, VII; BB. Mr. Vaughan.
- 104s. Sheep Husbandry. Similar in method to 103, with practice in shearing, blocking, feeding, and caring for lambs. Three credits. WF IV; 3St(F) and M V, VI, VII; center St(F). Mr. Anderson.
- 105s. Swine Husbandry. Topics of 103 as applied to swine production, marketing, costs, feeding, etc. Three credits. TS III; 3St(F) and Th V, VI, VII; center St(F). Mr. Ferrin.
- 106w. Advanced Meats. Practice work in dressing animals and cutting carcasses; also a study of the chemical composition of meat. Three credits. WF V, VI, VII; Meat Shop. Mr. Anderson.
- 108s. Seminar. Special assignments and review of investigations pertaining to the livestock industry. Three credits. MWF II; 3St(F). Mr. Peters.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201. Advanced Study of Livestock-Breeding. Studies of the methods followed in the building up of breeds of livestock and distinguished blood lines within the breeds. Review of scientific literature on livestock-breeding. Three to ten credits. Mr. Peters.
202. Advanced Livestock-Feeding. A study of experimental results bearing upon feeding questions and review of scientific literature applicable to them. Three to ten credits. Mr. Ferrin.
203. The Marketing of Livestock. A study of the methods used in the principal livestock markets. Three credits. Mr. Vaughan.
204. Advanced Study of the Breeds of Livestock. A study of the history, development, characteristics, and blood lines in any of the leading breeds of livestock. Three credits. Mr. Peters, Mr. Ferrin, Mr. Anderson, Mr. Vaughan.
205. Experimental Methods. Theory, plan, and conduct of experimental work in animal husbandry. Factors affecting results, sources of error, interpretation of data. Three credits. Mr. Ferrin.
- 207s. Meat Problems. The wholesale cuts and grades of meat, the packing industry and utilization of by-products, special problems and visits to meat-packing establishments. TS IV; and W V, VI, VII; Meat Shop. Mr. Anderson.

ANTHROPOLOGY

Professor Albert Ernest Jenks; Associate Professor Wilson D. Wallis.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 108f. Philippine Peoples. Comparative study of the four large ethnic and cultural groups in the Philippine Islands; the policy of the insular

- government as it affects American home interests in the Orient. TThS IV; 15F. Mr. Jenks.
110. Physical Anthropology. Mr. Wallis.
- 112s. The American Negro. Development of the American negro; his characteristics, conditions, and developing tendencies. Negro and immigrant adjustments. Prerequisites: three courses. Three credits. MWF III; 15F. Mr. Jenks.
- 113s. Peoples of Europe. Prerequisites: three courses. Three credits. MWF II; 15F. Mr. Jenks.
- 121w. Advanced Physical Anthropology. Prerequisites: physical anthropology, anatomy, or comparative anatomy. Three credits. Mr. Wallis.
- 123w-124s. Problems in Anthropology. An advanced course of method and independent research. Six credits. Mr. Jenks.
- 161s. Primitive Religion. Religious ideas and practices of primitive peoples. Prerequisites: Anthropology 51, or 62, or Philosophy 102. Three credits. Mr. Wallis.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 204f-205w-206s. Seminar in Anthropology. Individually directed research. Prerequisites: three courses. Three credits each quarter. Ar. 12F. Mr. Jenks, Mr. Wallis.

ARCHITECTURE

Professors Frederick M. Mann, Leon E. Arnal.

- 119f,w,s. Special Researches in Architectural History. Prerequisite: completion of undergraduate architectural history. Five credits or less per quarter. MW III; 320ME. Mr. Mann, Mr. Forsythe.
- 120f,w,s. Archaeology. Prerequisite: completion of undergraduate architectural history. Three credits or less per quarter. Ar. hours. Mr. Arnal.
- 139f,w,s. Advanced Architectural Design. Prerequisite: completion of undergraduate design. Ten credits or less per quarter. MTWThF VI, VII, VIII, IX; S I, II, III, IV; 317ME. Mr. Arnal.
- 140f,w,s. Technology of Building Materials. Prerequisite: Arch. 49 or Arch. 143. Three credits per quarter. Ar. hours. Mr. Jones.

ASTRONOMY

Professor Francis P. Leavenworth; Assistant Astronomer William O. Beal.

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

Prerequisites.—For major work, Course 51-52-53 and Mathematics 50; for minor work, Mathematics 50 and 3 credits in astronomy.

Exemptions from the language requirement for the Master's degree may be made in individual cases.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Practical Astronomy. Theory and use of astronomical instruments; astronomical photography, with measures of plates; study of method of least squares. Prerequisite: Mathematics 50. Three to 6 credits. MWF III; 124F. Mr. Leavenworth.
- 111f-112w-113s. Celestial Mechanics. Prerequisite: Mathematics 51. Three credits. Ar. Mr. Beal.
- 140w. Method of Least Squares. Applied especially to engineering, physics, and astronomy. Prerequisite: Mathematics 51. Three credits. TThS II; 124F. Mr. Leavenworth.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Practical Astronomy. Prerequisite: Astronomy 101-102. Three credits. Mr. Leavenworth.
- 204f-205w-206s. Astrophotography. Prerequisite: Astronomy 102. Three credits. Mr. Leavenworth.
- 208f-209w-210s. Calculation of Orbits. Prerequisite: Mathematics 51. Three credits. Mr. Beal.

BOTANY

Professors J. Arthur Harris, C. Otto Rosendahl, Josephine E. Tilden; Associate Professor Frederic K. Butters; Assistant Professors William S. Cooper, Rodney B. Harvey.

Note: For courses in plant pathology and mycology, see Department of Plant Pathology.

Prerequisites.—For major work, 36 quarter credits in botany; for minor work 20 credits.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

101. Elementary Biometry. Prerequisite: Eighteen credits in Biological sciences. Three credits. Ar. Mr. Harris.
- 108s. Morphology and Taxonomy of the Pteridophytes. An intensive study of lycopods, ferns, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. (Not offered in 1926-27.) Mr. Butters.
- 110w. Morphology and Taxonomy of the Gymnosperms. An intensive study of cycads, conifers, and their allies, their structure and history, with special attention to the classification of living forms. Lectures, reference reading, and laboratory work. (Not offered in 1925-26.) Mr. Butters.
- 113f-114w-115s. Advanced Taxonomy. An advanced course in which special attention is given to the taxonomy and difficult natural groups, involving systematic principles and practice, rules of nomenclature, systems of classification, etc. MWF V, VI; 202AB. Mr. Rosendahl.
- 118w-119s. Cytology. A survey of cell structure and the various phenomena of division, fusion, and metamorphosis, together with a review of the

- history of cytological investigations. Methods of cytological research indicated in the laboratory. MWF I, II; 202AB. Mr. Rosendahl.
- 123-124f-125w-126s. Morphology and Taxonomy of the Algae. Advanced studies in selected groups. Prerequisites: 15 credits including Course 12 for each course. Three credits for each course. TTh VI, VII, VIII; 104AB. Miss Tilden.
- Any of the above courses may be taken separately.
- 127s. Anatomy of Vascular Plants. The microscopic structure of vascular plants with particular attention to the development and evolution of the vascular system in the root, stem, and leaf. Prerequisites: 18 credits. Five credits. Ar. 213AB. Mr. Butters.
- 131f. Field Ecology. A survey of the local plant communities and successions, and a study of the general principles of plant association and succession. Prerequisite: Course 21. Five credits. Ar. G. Mr. Cooper.
- 132w. Ecological Anatomy. The individual plant and its parts as related to environment; special plant forms and structures, their causes and significance. Prerequisite: Course 21. Five credits. MTWFS III, IV; G. Mr. Cooper.
- 133s. Forest Geography of North America. Preliminary discussion of the principles of plant distribution followed by a detailed study of the forest regions of North America. Prerequisite: Course 21. Five credits. MWF VI, VII; G. Mr. Cooper.
- 141f. Physical Phases of Plant Physiology. The intake and translocation of materials, and the energy relations of the plant. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWThF I, II; G. Mr. Harvey.
- 142w. Plant Metabolism. The synthesis of plant food, its transformation and utilization by the plant. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWThF I, II; G. Mr. Harvey.
- 143s. Plant Metabolism and Growth. A continuation of Course 142, dealing with respiration, growth, and movement. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWThF I, II; G. Mr. Harvey.
- 144s. Plant Microchemistry. A study of the location of materials of physiological importance in the plant and their relation to physiological processes. Prerequisites: Course 22 and general organic chemistry. Five credits. MTWFS III, IV; G. Mr. Harvey.
- 145f,w,s. Advanced Biometry. Prerequisite: Course 101. Three credits. Ar. Mr. Harris.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. Research Problems in the Morphology of Vascular Plants. Mr. Butters.
- 205-206-207. Research Problems in the Taxonomy of Angiosperms. Mr. Rosendahl.
- 209-210-211. Research Problems in Algae. Miss Tilden.

- 213-214-215. Research Problems in Embryology. Mr. Butters.
217-218-219. Special Research Problems in the Taxonomy and Distribution of Algae. Miss Tilden.
221-222-223. Research Problems in Ecology. Mr. Cooper.
224. Research Methods in Plant Physiology. Mr. Harvey.
225-226-227. Research Problems in Plant Physiology. Mr. Harvey.
229-230-231. Research Problems in Cytology. Mr. Rosendahl.
233-234-235. Seminar. Students may register for one-hour seminar credit per quarter in any of the above research subjects.
237-238-239. Research Problems in Biometry. Mr. Harris.

CHEMISTRY

Professors Paul H. M.-P. Brinton, George B. Frankforter, William H. Hunter, Frank H. MacDougall, M. Cannon Sneed; Associate Professors I. William Geiger, Everhart P. Harding; Assistant Professors Lillian Cohen, Walter M. Lauer, Lloyd H. Reyerson, Lee I. Smith, Nelson W. Taylor.

In addition to the completion of the prescribed work, the candidate for a higher degree is expected to show a maturity acquired by intensive personal study of the literature and of the methods of chemistry.

Prerequisites.—(a) Chemistry as a major subject: All candidates who choose chemistry as a major subject for the Doctor's degree must offer the following courses or their equivalent as prerequisites: at least 12 quarter credits in general inorganic chemistry and qualitative analysis, at least 10 credits in quantitative analysis, and at least 10 credits in organic chemistry. All candidates must present at least one year of college physics or one year of college mathematics. (b) Chemistry as a minor subject: It is not possible to state exactly those courses which will be required in each case. If the major is not chosen in chemistry, the usual prerequisites will be at least 12 credits of general inorganic chemistry and qualitative analysis and 5 credits of quantitative or 5 credits of organic chemistry.

Students may not select two branches of chemistry as major and minor subjects except with the approval of the graduate faculty in the School of Chemistry.

The choice of the particular courses to be presented in fulfilment of a minor will be made after consultation with the student's adviser. Either Analytical Chemistry, Courses 120-121 or Organic Chemistry, Courses 135-136-137 will be acceptable as a minor for the Master's degree, or for not more than one half of a minor for the Doctor's degree, if the student is not taking major work in chemistry.

Language requirements.—Candidates for the Master's degree must have a reading knowledge of German or French; German is preferred. For the Doctor's degree, both are required.

GENERAL INORGANIC CHEMISTRY

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101s. History of Chemistry. The theories of chemistry from the period of the ancients, with particular emphasis on modern theories and laws. Prerequisite: Course 36. Two credits. Miss Cohen.
- 102w. Advanced Qualitative Analysis. Includes an analysis of minerals, alloys, paints, and the methods of detecting some of the rarer elements. Prerequisite: Course 21. Two or three credits. 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, complexions, etc. Prerequisites: Courses 21, 36. Three credits per quarter. Lect. MWF IV; 111C. Mr. Sneed.

ANALYTICAL CHEMISTRY

- 120w-121s. Quantitative Analysis. General principles, methods, and procedure both gravimetric and volumetric. Typical problems; laboratory practice. Prerequisite: Course 13. Five credits per quarter. Lect. M VI; 325C. Rec. F VI; 315C. Lab. W VI-IX; MF VII-IX; 310C. 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. One lecture, seven laboratory hours per week. Prerequisite: Course 21 or 27. Three credits. Lect. T VI; 315C. Lab. T VII-IX; Th VI-IX; 310C. Mr. Brinton.
- 127f-128w-129s. Chemistry of the Rare Elements. Chemical relations and general reactions of rarer elements not considered in general courses. Analyses of commercially important ores and compounds of these elements are made. One lecture and six laboratory hours per week. Prerequisite: Course 21. Three credits per quarter. Mr. Brinton.
- 227f-228w-229s. Selected Topics in Analytical Chemistry. Analytical problems of an advanced nature presenting special difficulties will be selected for study and investigation in the laboratory, in the library, and by conference. Open only to graduate students who have had 18 credits of quantitative analysis, and who have a reading knowledge of French and German. Two, three, or four credits per quarter. Mr. Brinton.

ORGANIC CHEMISTRY

- 131s. Organic Analysis. Practice in the identification of organic compounds, and the modern methods of quantitative organic analysis. Prerequisite: Course 37. Three credits. Mr. Lauer.
- 132w. The Rise and Development of Organic Chemistry. Includes biographical and other phases necessary to a complete discussion of the subject. Prerequisite: Course 37. Two credits. Mr. Frankforter.

- 133f. Reagents in Organic Chemistry. A discussion of typical reagents used in organic reactions; their limits of applicability, methods of use, and types of substances with which they react. May be accompanied by appropriate laboratory work in Chemistry 138. Prerequisite: Course 37. Three credits. Lect. MWF II; 325C. Mr. Smith.
- 134f. The Terpenes. Includes a complete review of the terpenes proper, together with a discussion of the gums and resins, and other allied compounds. May be accompanied by appropriate laboratory work in Chemistry 138. Prerequisite: Course 37. Two credits. Mr. Frankforter.
- 135f-136w-137s. Organic Chemistry. Full discussion of aliphatic and aromatic series with preparation of some of the more important compounds; other work of special nature will also be required. Offered to graduate students taking their minor in chemistry. Prerequisite: Course 13. Five credits per quarter. Lect. MWF III; 325C. Rec. Th III; 111C. Lab. TTh VI-VIII; 390C. Mr. Hunter.
- 138f,w,s. Advanced Organic Chemistry Laboratory Work. Difficult preparations and problems. It is intended primarily to supplement the student's knowledge of the methods of organic chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses. Prerequisite: Course 37. Two to five credits. Lab. ar; 390C.
- 139f,w,s. Advanced Organic Chemistry Laboratory Work. An introduction to research work. These advanced laboratory courses may be taken under any member of the Division of Organic Chemistry. Prerequisite: Course 37. Two to five credits. Lab. ar; 390C.
- 191f-192w-193s. Advanced Organic Chemistry. An introduction to the literature of organic chemistry. Structure, reaction mechanism, and relation of physical properties to constitution. May be accompanied by appropriate laboratory work in Chemistry 138-139. Prerequisite: Course 37. Three credits per quarter. TThS III; 315C. Mr. Hunter.
- 231f-232w-233s. Organic Chemistry Seminar. One hour a week. Open only to students taking research in organic chemistry. One credit. Mr. Hunter.

PHYSICAL CHEMISTRY

- 140f-141w-142s. Physical Chemistry. A general survey of the subject. Three lectures and one recitation. Laboratory work three or six hours per week. Prerequisites: two years college chemistry, 1 year college physics. Three, four, or five credits, depending on the amount of laboratory work. Lect. MWF IV; 325C. Rec. S IV; 115C. Lab. WF VI-VIII; 15C, 117C. Mr. MacDougall.
- 143f,w. Physical Chemistry. Designed chiefly for medical and biological students. Prerequisite: Course 32. Four credits. Mr. Taylor.
- 146f-147w-148s. Advanced Physical Chemistry. Three lectures and one recitation. Laboratory work for one three-hour period may be taken if desired. Prerequisites: 142s and calculus. Three credits per quarter, or four with laboratory. Mr. Taylor.

- 149s. Principles of Colloidal Chemistry. Prerequisites: Course 141 and calculus. Two credits. (Not offered in 1925-26.) Mr. Reyerson.
- 150s. Application of Colloidal Chemistry. Prerequisite: Course 141. Two credits. Mr. Reyerson.
- 157f-158w-159s. Colloid Chemistry Laboratory. Credits and hours to be arranged. Must be preceded or accompanied by Physical Chemistry 149 or 150. Mr. Reyerson.
- 243f-244w-245s. Thermodynamics and Chemistry. A detailed study of the principles of thermodynamics and their application to physical and chemical phenomena. Prerequisites: Course 142 and calculus. Four credits per quarter. Mr. MacDougall.
- 246f-247w-248s. Kinetic Theory and Atomistics. Kinetic theory of gases and liquids, crystal structure, structure of atom, quantum theory. Prerequisites: Course 142 and calculus. Four credits per quarter. (Not offered in 1925-26.) Mr. MacDougall.
- 250f-251w-252s. Physical Chemistry Seminar. One hour a week. For students taking advanced courses in physical chemistry. One credit. Mr. MacDougall, Mr. Reyerson, Mr. Taylor.
- 253f-254w-255s. Advanced Physical Chemistry Laboratory. To accompany or follow any of the advanced courses in physical chemistry. Prerequisite: Course 142. Credits arranged. Mr. MacDougall.

TECHNOLOGICAL CHEMISTRY

- 161f-162w-163s. Food Analysis. Prerequisite: Course 21. Three credits per quarter. Lect. T IV; 215C. Lab. F II-III, VI-IX; 217C. Mr. Harding.
- 164w. Exact Gas Analysis. Prerequisite: Course 21. One or two credits. Mr. Harding.
- 166s. Microchemistry. The precipitation, examination, and identification of minute quantities of substances and the examination of food materials, fibers, etc., by means of the microscope. Prerequisite: Course 21. One or two credits. Mr. Harding.
- 167f. Gas and Fuel Analysis. The chemical analysis and colorimetry of solid and gaseous fuels and methods of testing municipal gas. Prerequisite: Course 21. Three credits. Lect. S I; 215C. Lab. TTh I-III; 10C, or Th VI-VIII, S II-IV; 10C. Mr. Harding.
- 168w. Petroleum and Petroleum Products. Examination and testing principally of gasoline, illuminating and lubricating oils. Prerequisite: Course 21. Three credits. Lect. S I; 111C. Lab. TTh I-III; 10C, or Th VI-VIII; S II-IV; 10C. Mr. Harding.
- 169f,w,s. General Technical Analysis. Includes a large range of topics: textiles and paper, paints and varnishes, asphalt and tars, boiler waters, soaps, edible oils and fats, and various other food materials and food products. Prerequisite: Course 21. One, two, or three credits. Lect. Th II; 215C. Lab. TS I-III; 217C. Mr. Harding.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 301f-302w-303s. Research Work in Inorganic Chemistry. Credits to be arranged. Mr. Sneed, Mr. Reyerson.
- 321f-322w-323s. Research Work in Analytical Chemistry. Credits to be arranged. Mr. Brinton, Mr. Geiger.
- 331f-332w-333s. Research Work in Organic Chemistry. Credits to be arranged. Mr. Hunter, Mr. Frankforter, Mr. Lauer, Mr. Smith.
- 341f-242w-343s. Research Work in Physical Chemistry. Including work in electrochemistry and colloids. Credits to be arranged. Mr. MacDougall, Mr. Reyerson, Mr. Taylor.
- 361f-362w-363s. Research Work in Technological Chemistry. Credits to be arranged. Mr. Harding.

CHEMICAL ENGINEERING

Professors Charles A. Mann, George B. Frankforter; Assistant Professors George H. Montillon, Ralph E. Montonna.

Prerequisites.—Before being admitted to major work in chemical engineering, the student should have received the Bachelor's degree in chemical engineering or its equivalent. If he has not met this requirement, it will be necessary for him to pursue such additional preparatory studies as may be prescribed by the adviser.

The student selecting chemical engineering as a minor must present as prerequisites mathematics including integral calculus, physics, analytical and organic chemistry, and mechanical drawing.

Requirements.—For the degree of master of science in chemical engineering, the major subject and the thesis must be taken in Chemical Engineering.

Students may not select chemical engineering in combination with any branch of chemistry as major and minor subjects except with the approval of the group committee.

The candidate for the Master's or the Doctor's degree with chemical engineering as a major must have completed, as undergraduate or graduate, a year's work in physical chemistry, such as, for example, Courses 140f-141w-142s, or their equivalent.

For the requirements for the professional degree of chemical engineer, see page 17.

Languages.—Candidates for the Master's degree in chemical engineering must have a reading knowledge of German or French; German is preferable in this field. For the Doctor's degree, both are required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 171s. Chemical Machinery. Principles and materials of construction, operation, and uses of chemical machinery. Lectures and recitations. Laboratory work in operating and testing. Visits to chemical plants. Prerequisites: Courses 21, 36. Four credits. MTWThF I; 111C. Mr. Mann.

- 172f. Industrial Inorganic Chemistry. Operations common to chemical industries, marketing of products, utilization of by-products, trade journals. Lectures and recitations. Prerequisite: Course 171. Four credits. MTWThF I; 111C. Mr. Mann.
- 173w. Industrial Organic Chemistry. Similar to above but covering organic fields. Lectures and recitations. Prerequisite: Course 172. Four credits. MTWThF I; 111C. Mr. Mann.
- 174f. Chemical Manufacture (Inorganic). Manufacture of technical products on a scale large enough to afford data for the determination of cost of manufacture. Use of semi-plant scale equipment and technical trade journals. Laboratory. Prerequisite: Course 171. Two or more credits. Lab. T I-IX or Th I-IX; 90C. Mr. Montonna.
- 175w. Chemical Manufacture (Organic). Similar to above but covering the organic field. Laboratory. Prerequisite: Course 171. Two or more credits. Lab. T or Th I-IX; 90C. Mr. Montonna.
- 176f-177w. Applied Electrochemistry. Application of the electric current to chemical processes. Laws and phenomena of electrochemistry, batteries, electro-plating, electric furnace construction and operation, and electrolytic and electric furnace products. Prerequisite: Course 142. Four credits per quarter. Lect. MWF III; 111C. Lab. Th VI-VIII. Mr. Montillon.
- 178s. Chemical Engineering Calculations. Problems in drying, evaporation, filtration, and general chemical processes. Prerequisite: Course 173. Three credits. Lect. MWF III; 111C. Mr. Montillon, Mr. Montonna.
- 179s. Advanced Applied Electrochemistry. The more recent developments in this field. Prerequisites: Courses 142, 176, 177. Four credits. Mr. Mann, Mr. Montillon.
- 180f-181w-182s. Design of Chemical Equipment and Plants. Based on collected data on the subject. Classroom and laboratory work. Prerequisite: Course 173. Two credits per quarter. MF VI-VIII. Mr. Montillon.
- 183f. Chemistry of Explosives. History, development, manufacture, and uses. Lectures, required reading, and reports. Prerequisite: Course 173. Four credits. (Not given in 1925-26.) Mr. Frankforter.
- 184s. Organic Dyestuffs. The technical chemistry of commercial dyes and their intermediates. Class and laboratory. Prerequisite: Course 173. Five credits. Mr. Frankforter.
- 185s. Advanced Chemical Manufacture. Problems in the manufacture of special chemicals on a large scale, using the industrial chemistry laboratory. Prerequisites: Courses 174, 175. Three credits. Mr. Montonna.
- 186s. Gas Manufacture and Distribution. Prerequisites: Courses 21, 27. Three credits. Mr. Montillon.
- 188w. 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. Prerequisite: 37 or equivalent. Three credits. Hours ar. Mr. Montonna.

271f-272w-273s. Seminar. Presentation and discussion of papers concerning the newer developments in chemical industries. One credit. Mr. Mann, Mr. Montillon, Mr. Montonna.

COURSES PRIMARILY FOR GRADUATE STUDENTS

371f-372w-373s. Research Work in Chemical Engineering; Industrial Inorganic and Industrial Organic Chemistry; or Applied Electrochemistry, Electric Furnace Work, and Chemical Manufacture. Credits as ar. Mr. Frankforter, Mr. Mann, Mr. Montillon, Mr. Montonna.

CIVIL ENGINEERING

Professors Frederic H. Bass, Alvin S. Cutler, Frederick M. Mann, John I. Parcel, Frank B. Rowley; Assistant Professors Fred C. Lang, George A. Maney.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

For prerequisites see bulletin of College of Engineering and Architecture.

- 121f. Railway Engineering. Design and construction of railroad buildings and tracks. Methods of computing earthwork, and estimates and reports. Three credits. Mr. Cutler.
- 122w. Railway Engineering. Train resistance, grades, curvature, distance, rise and fall, as factors in location and operation of railroads. Train-loading, acceleration, retardation; locomotives and equipment. Operating costs governing grade revision. Three credits. Mr. Cutler.
- 123s. Railway Engineering. Lectures, office work, and field inspection. Design and operations of various types of yards and terminals, and terminal facilities. Signalling and interlocking. Three credits. Mr. Cutler.
- 124w. Transportation. Operating problems of railway, highway, ocean, and inland waterway transportation. Typical design and equipment. Cost and value of service, valuation, regulation, present systems, and organizations. Three credits. Mr. Cutler.
- 125s. Transportation. Specific illustrative problems: Twin City and Mississippi Valley traffic situation, Mississippi River experiment, New York Barge Canal, Great Lakes traffic, St. Lawrence River project, Panama Canal status. Rapid transit, motor transport. Aerial transport. Three credits. Mr. Cutler.
- 131f. Bridge Analysis. Stresses in simple span railway bridge trusses of the larger type. Four credits. Mr. Maney.
- 132w. Bridge Design. Design and detail drawing of railway plate girder viaduct. Three credits. Mr. Maney.
- 133s. Bridge Design. Complete design and detail drawing of railway pin truss span. Three credits. Mr. Maney.
- 134s. Statically Indeterminate Structures. General theory deflections and statically indeterminate stresses and their application to continuous

- girders, frames, swing bridges, redundant members. Three credits. Mr. Parcel, Mr. Maney.
- 146f,w,s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three credits. Mr. Lagaard.
- 161f. Hydrology. Rainfall, evaporation, transpiration, percolation, run-off. Flood and low water flows of streams. Storage problems. Three credits. Mr. Bass.
- 162w. Water Supply Engineering. Sources of supply. Laboratory methods of testing water; wells, surface water intakes, conduits and pipe lines, distribution systems, and purification plants. Selection of pumping machinery and motive power. Three credits. Mr. Bass.
- 163s. Sanitary Engineering. Quantities of sewage and storm water; precipitation and run-off. Sanitary sewer system for a small community; storm water system for a city district. Steam pollution and sewage disposal. Three credits. Mr. Bass.
- 164w-165s. Water Power. Types of low, medium, and high head developments. Details of developments. Types of dams. Turbine settings and characteristics. Three credits. Mr. Bass.
- 171f. Building Sanitation. The location and orientation of buildings; lighting, ventilation, water supply, plumbing, sewage, and refuse disposal. Two credits. Mr. Bass.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 221f-222w-223s. Railway Administration. An analysis of railway organization and methods of management and operation. Principles of valuation and rate-making. Three credits. Mr. Cutler.
224. Railway Terminals and Yards. A continuation of Course 123. Three credits. Mr. Cutler.
- 234f-235w-236s. Advanced Structural Design. Fundamental theory of stresses applied to special problems. Relative economy in design. Comparative study of specifications. Three to five credits per quarter. Mr. Parcel.
- 237-238. Structural Laboratory. Similar to 234, but dealing mainly with experimental problems in structural steel. Strain gauge study of actual stress distribution in beams, columns, and riveted joints. Three to five credits per quarter. Mr. Maney, Mr. Lagaard.
- 245f-246w-247s. Advanced Reinforced Concrete Analysis. Critical review of the literature of reinforced concrete and study of the advanced theory. Study of test data and analysis of stresses in reinforced concrete structures. Three to five credits per quarter. Mr. Maney, Mr. Lagaard.
- 251s. Highway Laboratory. Investigation in co-operation with State Highway Department. Three to five credits. Mr. Lang.
252. Highway Administration. Problems of highway administration and finance. Three to five credits. Mr. Lang.
- 261s. Water and Sewage Purification. Continuation of Course 163. Design of water purification and sewage disposal. Three to five credits. Mr. Bass.

262. Water Supply Problems. Continuation of Course 162. Three to five credits. Mr. Bass.
272. City-Planning. The physical elements of the city; topography, drainage, geology. Public works and structures. Street arrangements; rapid transit; railroad terminals. City-districting. Subsurface structures. Esthetic features of the city; the civic center; parks; boulevards; public buildings. Three to five credits. Mr. Bass, Mr. Mann.
- 280f-281w-282s. Civil Engineering Research. Original work along lines of plain and reinforced concrete, structural steel, hydraulics, municipal and transportation problems. Investigations, reports, tests, designs. Five credits per quarter. Mr. Bass, Mr. Cutler, Mr. Parcel, Mr. Lang, Mr. Maney, Mr. Lagaard.

COMPARATIVE LITERATURE

Professor Oscar W. Firkins.

- 101-102-103.† Drama. An outline of the history of drama, including the drama of today. Lectures and readings. TThS III; 113F. Mr. Firkins.
- 105-106-107.† Principles of Criticism. Lectures and readings. MWF VI; 113F. Mr. Firkins.
110. The International Romantic Movement in Europe (1775-1825). TThS II; 113F. Mr. Firkins.
203. The Arthurian Legend: from Geoffrey of Monmouth to Tennyson and Wagner. Mr. Firkins.
206. French and English Literary Criticism: from the sixteenth century to the present time. Mr. Firkins.

COMPARATIVE PHILOLOGY

Professor Frederick Klaeber; Associate Professor Samuel Kroesch.

Prerequisites.—This department, besides offering courses in the general principles of linguistic science, affords an opportunity for elementary studies in comparative Indo-European philology, and more particularly the investigation of Old Germanic dialects. Related courses in English philology will be found under English Language and Literature.

As a matter of course, candidates for the Master's degree must have a knowledge of Latin and German; candidates for the Doctor's degree must have a knowledge of Greek also.

Students are advised to confer with the department before selecting courses.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w. General Introduction to the Science of Language. Prerequisite, one of the following groups: (1) five years' foreign language, four may be in high school and one in college; (2) two years' foreign language. Six credits. IV; 205F. Mr. Klaeber.

- 103f. Universal Language. Comparison of families of languages grammatically and lexically. Movement for creation of an international language. Prerequisites same as for Course 101. Three credits. TS IV; 205F. Mr. Klaeber.
- 105s. The Life of Words. Etymology, and semasiology. Growth of vocabulary; change of words in form and meaning. Prerequisites same as for Course 101. Three credits. TTh VI; 205F. Mr. Klaeber.
- 108s. Comparative Phonetics. A study of speech sounds and the nature of their production with especial reference to English, French, and German. Open to students of the modern languages. Prerequisites: 2 credits in other than elementary courses. This course is identical with German 108. Three credits. Hours to be arranged. Mr. Kroesch.
- 109f-110w-111s. History of the German Language. Identical with German 109-110-111. Nine credits. Hours to be arranged. Mr. Klaeber.
- 141f-142w-143s. Historical Grammar of the English Language. I. Sounds and spelling. II. Accidence and syntax. Nine credits. Hours to be arranged. Mr. Klaeber.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201. Comparative Grammar of the Greek, Latin, and Germanic Languages. A general survey of the field of Indo-Germanic philology will be included.
- 202-203. Gothic. The relation of Gothic to other Germanic dialects will be particularly emphasized. Study of the grammar, reading of texts, discussion of problems. Mr. Klaeber.
205. Ugermanische Grammatik. Lectures and study of standard works. Mr. Klaeber.
- 206-207-208. Old Saxon. Old Saxon grammar; interpretation of the *Heliand* and *Genesis*. Mr. Klaeber.
- 209-210-211. Old High German. Braune's *Althochdeutsche Grammatik*; Braune's *Althochdeutsches Lesebuch*. This course is identical with German 209-210. Mr. Klaeber.
- 212-213. Research Seminar. Competent graduate students will be advised and assisted in research along special lines. Mr. Klaeber.

DAIRY HUSBANDRY

Professors Clarence H. Eckles, Willis B. Combs; Associate Professor Otto G. Schaefer; Assistant Professor Harold Macy.

Students taking their major in dairy husbandry may be exempted from the language requirements for the Master's degree.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Milk Production. Problems of the dairy farmer. MTWFS IV; 210HH. Mr. Eckles.
- 102s. Market Milk. Lectures and laboratory work. MW IV; Th VI, VII, VIII; 210HH. Mr. Macy.

- 103w. Dairy Stock Feeding. Application of the principles of nutrition to special problems of feeding the dairy cow and growing the young animals. MWF III; 210HH. Mr. Eckles.
- 104f. Advanced Study of Dairy Breeds. Practice in comparative judging; selection and valuation; visits to purebred herds. MW VI, VII, VIII; F VI; 210HH. Mr. Schaefer.
- 105f-106w-107s. Seminar. Special investigations and study of selected topics. Reports on assigned subjects and reviews of recent scientific investigations. S II; 210HH. Mr. Eckles.
- 111f. Dairy Products I. The chemical, bacteriological, and economic problems in the manufacture and marketing of butter, condensed and powdered milk. MW VI; F VI, VII, VIII; 210HH. Mr. Combs.
- 112s. Dairy Products II. Similar to 111f with special application to cheese and ice cream. TS IV; T VI, VII, VIII; 210HH. Mr. Combs.
- 113s. Technical Control. Chemical and bacteriological laboratory methods used in technical control of milk and its products. TTh I, II, III; 102HH. Mr. Combs, Mr. Macy.
- 114su. Problems in Dairy Husbandry. A study of special problems in dairy husbandry. Open only to the teacher of agriculture and the extension worker. (See Summer Session bulletin.) 210HH. Mr. Schaefer.
- 115f,w,s. Problems in Dairy Bacteriology. Prerequisite Dairy Husbandry 2 or equivalent, Dairy Husbandry 111 or 112. Investigations of specific problems in the bacteriology of milk and dairy products. Ar. Mr. Macy.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201w,s. Dairy Bacteriology. Lectures, assignments, laboratory work. Types of milk organisms, relation of the bacteria of milk to dairy manufactures and to public health, the bacteriology of dairy products. Winter, MWF VI, VII, VIII; Spring, MWF I, II, III; 210HH. Mr. Macy.
- 202f-203w-204s-208su-210su. Research in Dairy Husbandry. Facilities offered for study and investigation of subjects pertaining to dairy cattle. Students are allowed to assist at times with investigations under way in the experiment station. Arranged to meet the needs of the individual student. Open in the Summer Session only to those who have had preliminary graduate work. Mr. Eckles.
- 205f-206w-207s-209su-211su. Dairy Products. Opportunity and facilities are offered for study and investigation of problems concerning dairy products. The work is arranged to meet the needs of the individual student. Open in the Summer Session only to those who have had preliminary graduate work. Mr. Combs.

ECONOMICS

Professors George W. Dowrie, John D. Black, Roy G. Blakey, Frederic B. Garver, Norman S. B. Gras, Alvin H. Hansen, Bruce D. Mudgett; Associate Professors Ernest A. Heilman, H. Bruce Price, Clare L.

Rotzel, J. Warren Stehman, Roland S. Vaile, Holbrook Working; Assistant Professors Walter R. Myers, John J. Reighard, Warren C. Waite; Professorial Lecturer J. Franklin Ebersole.

Candidates for higher degrees will be accepted as majors in economics in the following fields: money and banking, public finance, economic theory, economic history, labor statistics, agricultural economics (marketing, land economics, farm finance, economics of agricultural production, agricultural prices); in accounting, only for the Master's degree.

GENERAL ECONOMICS

Prerequisites.—For major work, 27 quarter credits for those offering Economics 1-2 and 3, or their equivalent; 18 quarter credits for those not presenting one of these courses or an equivalent. These credits should include Money and Banking, Statistics, and Accounting. Candidates not presenting these fundamental courses upon registration in the Graduate School may be required to complete them in addition to the regular course requirements for the degree.

Majors and minors.—Major and minor work for the Master's degree may both be taken in economics if the candidate presents a program of courses properly complementing each other and not too closely related, if approved by the Executive Committee of the Graduate School. Agricultural economics, economic history, and accounting will usually be considered satisfactory as majors or minors distinct from general economics.

Required courses.—All candidates for advanced degrees must complete Economics 103-104, or Economics 203-204-205, or the equivalent of either. Other courses will be required according to the field in which the candidate is working. Ordinarily at least one full graduate seminar must be carried throughout the year.

Language requirement.—Candidates for the Master's degree in economics are required to have a reading knowledge of a foreign language only when the thesis is written in the following fields: money and banking, public finance, economic theory, economic history, and labor.

AGRICULTURAL ECONOMICS

Prerequisites.—For major work 18 quarter credits. If, however, these credits do not include courses in Money and Banking, Statistics, and Accounting, these may be required in addition to the regular course requirements for the degree. Farm Management II and III may be included as economics prerequisites.

Majors and minors.—Upon approval of the graduate faculty, candidates doing their graduate work in agricultural economics may take their minor in general economics.

Language requirement.—Candidates for the Master's degree in agricultural economics are not required to have a reading knowledge of a foreign language.

A. GENERAL ECONOMICS

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

Note.—The following courses in other departments carry credit also in Economics: History 113-114-115, Economic History of Europe since 1750; 116-117-118, Economic History of Europe, 1300-1750; 169, Economic History of the United States since 1865; 210-211-212, Graduate Seminar in Economic History. Political Science 105, Colonization; 157, Police Power; 158, Government and Business; 159, Law of Public Utilities.

- 103f-104w. Value and Distribution. Six credits. VII; MWF; 102B. Mr. Garver, Mr. Waite.
- 105s. History of Economic Ideas. The classical economists. Three credits. (Not offered in 1925-26.) Mr. Garver.
- 106s. History of Economic Ideas. The critics of the classical economists. Three credits. MWF IV; 202B. Mr. Hansen.
- 112f. Business Statistics. Three credits. MWF I; 6B. Mr. Mudgett, Mrs. Kittredge.
- 113w-114s. Theory of Statistics. Six credits. MWF I; 6B. Mr. Mudgett, Mrs. Kittredge.
- 130f. Cost Accounting. General Survey. Three credits. TThS III; 6B. Mr. Ostlund.
- 131f-132w-133s. Cost Accounting. Nine credits. TThS II; 303B. Mr. Ostlund.
- 134f. Income Tax Accounting. Three credits. MWF II; 302B. Mr. Reighard.
- 135w-136s. Auditing. Six credits. MWF II; 302B. Mr. Reighard.
- 137f-138w. Accounting Practice and Procedure. Six credits. MWF IV; 303B. Mr. Heilman.
- 139s. Advanced General Accounting. Three credits. MWF IV; 303B. Mr. Heilman.
- 143f-144w, 143w-144s. The Financial System. Eight credits. Fall to winter. Lecture W III; MuAud. (1) MTW VIII; 209B. (2) MWF II; 106B. (3) MWF II; 102B. (4) TThS II; 106B. (5) TThS III; 209B. (6) TThS III; 202B(f), 109B(w). (7) MWF V; 209B. (8) MWF VI; 209B. Winter to spring. Lecture S IV; 202B. (1) MWF II; 104B(w), 209B(s). (2) MWF IV; 104B. (3) MWF VII; 203B(w), 102B(s). Mr. Dowrie and others.
- 145s. Foreign Exchange. Three credits. MWF IV; 102 B. Mr. Myers.
- 146f. Investments. Three credits. MTW IX; 202B. Mr. Ebersole.
- 147s. Bank Administration. Three credits. MTW IX; 202B. Mr. Ebersole.
- 149w,s. Business Cycles. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. Three credits. Winter, MTW IX; 202B. Spring, MTW VIII; 202B. Mr. Ebersole.
- 150s. Advanced Farm Finance. Three credits. W VI-VII; 104B. Mr. Myers.
- 153w. The Trust Problem. Three credits. MWF II; 202B. Mr. Stehman.

- 154s. Public Utilities. Three credits. MWF II; 102B. Mr. Garver.
- 155s. Corporation Finance. Three credits. Lect. Th III; 301F. (1) MW II; 109B. (2) MW III; 6B. (3) MW III; 202B. (4) MW IV; 209B. (5) TTh VI; 102B. (6) TTh VII; 102B. Mr. Stehman.
- 156f. Advanced Corporation Finance. Three credits. (1) TThS I; 102B. (2) TThS II; 102B.
- 161f,w. Labor Problems and Trade Unionism. Three credits. Fall. Lect. MW IV; 202B. (1) F IV; 202B. (2) F IV; 109B. (3) F II; 213B. Winter. TThS III; 202B. Mr. Hansen.
- 162w. The Labor Movement in America and England. Three credits. MWF IV; 202B. Mr. Hansen. (Not offered in 1925-26.)
- 163w. Economic Aspects of Population and Immigration. Three credits. Mr. Hansen.
- 167w. Personnel Administration. Managerial policy, for various types of organization, on labor. Special attention to job analysis. Employment incentives, and regularization of employment. Three credits. TThS II; 202B. Mr. Hansen, 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. Three credits. TThS II; 209B. Mr. Hansen, Mr. Stead.
- 169s. The Labor and Socialist Movement in Europe. Three credits. (Not offered in 1925-26.) Mr. Hansen.
- 176f,s. Commercial Policies. Theory of international commerce; free trade reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized. Three credits. MWF I; 202B. Mr. Blakey.
- 177w. Foreign Trade. Three credits. MWF I; 202B. Mr. Blakey.
- 180f-181w-182s. Seminars for Seniors and Graduates. Intensive study of problems in respective fields of specialization. In 1925-26 seminars will be offered in the following:

No.	Title	Hour	Day	Building
A.	Accounting	V½-VI	TTh	302B
B.	Business Finance	VII-VIII	T	213B
C.	Marketing	VI-VII½	TTh	104B

- 191f-192w. Public Finance. Six credits. (1) MWF III; 209B. (2) MWF IV; 209B. Mr. Blakey.
- 193s. State and Local Taxation. Three credits. MWF III; 209B. Mr. Blakey.

COURSES FOR GRADUATE STUDENTS

- 203f-204w-205s. Seminar in Economic Theory. Intensive study of a limited field in economic theory. Individual investigation, reports, and group discussion. Nine credits. TTh VIII½-IX; 104B. Mr. Garver.
- 210f-211w-212s. Seminar in Labor. Nine credits. Ar. Mr. Hansen.
- 243f-244w-245s. Seminar in Private Finance. Six credits. M VIII-IX; 104B. Mr. Dowrie.

B. AGRICULTURAL ECONOMICS

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 110f-111w. Economics of Agricultural Production. Six credits. TThS I; 1PP. Mr. Black.
- 126s. Economics of Consumption. Three credits. MWF I; 4PP. MWF IV; 4PP. Mr. Waite.
- 130f. Prices of Farm Products. Three credits. TThS II. Mr. Working.
- 131w. Market Prices. Three credits. TThS III. Mr. Waite.
- 135s. Methods of Forecasting Prices. Three credits. TThS III. Mr. Working.
- 140f. Principles of Marketing Organization. Three credits. MWF I. Mr. Price.
- 140s. Principles of Marketing Organization. Three credits. TThS II. Mr. Price.
- 141w. Marketing Organization: Semi-Perishables. Three credits. TThS II. Mr. Price, Mr. Gaumnitz.
- 142s. Marketing Organization: Perishables. Three credits. MWF III. Mr. Price, Mr. Holt.
- 145w-146s.¹ Marketing Management. Three credits. MWF IV; 102B. Mr. Gaumnitz, Mr. Holt.
- 147s. Marketing Accounting. Three credits. TThS II. Mr. Price, Mr. Holt.
- 151f,s. Seminar in Transportation of Farm Products. Three credits. Ar.
- 160s.¹ Advanced Farm Finance. Three credits. F VI-VII. Mr. Myers.
- 170s.¹ Land Economics. Three credits. TTh VII-VIII½; 202B. Mr. Black.
- 171w. Land Tenure. Three credits. MWF III. (Not given in 1925-26.) Mr. Black.
- 190s. Agricultural Statistics. Three credits. TThS III. Mr. Working.

COURSES FOR GRADUATE STUDENTS

- 200f-201w-202s. General Seminar in Agricultural Economics. Credits to be arranged. Ar. (Under this head are arranged special seminars on subjects suited to the needs of the particular groups of graduate students, or on subjects upon which members of the staff are doing work at the time.) Mr. Black, Mr. Price, Mr. Working.
- 203f-204w-205s. Seminar in the Current Literature of Agricultural Economics. One credit per quarter. Friday evening. Mr. Black, Mr. Price, Mr. Working.
- 206w. Agricultural Policy. Three credits. MW VI-VII½. Mr. Black.
- 210f. Seminar in Production Economics. Three credits. TTh VI-VII½. Mr. Black.
- 217s. Seminar in Research Methods in Production Economics. Three credits. F VIII-IX. Mr. Black.

¹ These courses are offered on the Minneapolis campus.

220. Seminar in Farm Household Economics. To be arranged. Topics: rural standards of living, cost of living on the farm, administration of farm incomes.
- 230s. Seminar in Prices of Farm Products. Three credits. TTh VI-VII½. Mr. Working.
- 237w. Seminar in Research Methods in Price Analysis. Three credits. F VIII-IX. (Not given in 1925-26.) Mr. Working.
- 240s. Seminar in the Marketing of Cereals. Three credits. MF VI-VII½. (Offered in 1926-27 and in alternative years thereafter.) Mr. Price.
- 241s. Seminar in the Marketing of Livestock and Livestock Products. Three credits. MF VI-VII½. (Offered in 1925-26 and in alternate years thereafter.) Mr. Price, Mr. Gaumnitz.
- 244w. Seminar in Co-operative Marketing. Three credits. TTh VI-VII½. (Offered in 1925-26 and in alternate years thereafter.)
246. Seminar in the Economics of Consumption. To be arranged.
- 247f. Seminar in Research Methods in Marketing. Three credits. (Not offered in 1925-26.) Mr. Price, Mr. Black.
- 265f. Seminar in Agricultural Taxation. Three credits. MW VI-VII½. (Offered in 1925-26 and in alternative years thereafter.)
- 273f. Seminar in Land Values. Three credits. MW VI-VII½. (Offered in 1926-27 and in alternative years thereafter.) Mr. Black.

EDUCATION

Professors Fred Engelhardt, Melvin E. Haggerty, Earl Hudelson, Leonard V. Koos, Wylle B. McNeal, Wilford S. Miller, Charles A. Prosser; Associate Professor Leo J. Brueckner, Frank W. Lathrop; Assistant Professors Ross L. Finney, Marvin J. Van Wagenen; Professorial Lecturer Anne D. Blitz.

Prerequisites.—For major work at least 6 quarter credits in psychology and in addition to this a total of not less than 18 quarter credits of undergraduate work in education.

Exemption from the language requirement for the Master's degree may be made in individual cases.

Departmental conferences.—Every alternate Monday all graduate students majoring in education are expected to meet with the departmental staff from 7:30 to 9:00 p.m. for conference regarding subjects of original investigation. This work carries no credit.

NOTE.—Candidates for the university teacher's certificate may offer Course 101, 102, or 103 in place of Education I.

GENERAL COURSES

- 208f. Methods in Educational Research. A study of the methods employed in treatment and presentation of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for degrees. Two credits. S I, II. Ar. Mr. Haggerty.

228-229-230. Problems of College Education. Fall term: Problems of Student Personnel. Winter term: Problems of College Instruction. Spring term: Problems of Organization and Administration. The course will consist of discussions and lectures by members of the university staff. May be taken for credit by graduate students. Six credits. 7:30-9:30 p.m. Monday.

ADMINISTRATION AND SUPERVISION

- 113f. High School Curriculum. A study of types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units. Prerequisites: 10 hrs. in education including Ed. 55. Three credits. M IX; TTh VIII; 112Ed. Mr. Koos.
- 115f,w,s. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul. Three credits. Mr. Brueckner, Mr. Peik.
- 119s. Elementary School Curriculum. A study of the principles underlying the organization of subject-matter for courses in the elementary school, including an examination of curricula, syllabi, and school texts in the light of their function in the teaching and administration of the curriculum. Prerequisites: 1, 3. Three credits. MWF I. Ar. Mr. Peik.
- 119Tf-120Tw. Elementary School Curriculum. (Same as above for teachers.) Four credits. S I, II; 113Ed. Mr. Peik.
- 121w. 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. Three credits. Ar. Miss Blitz.
- 123s. 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. Prerequisites: 10 hrs. in education. Three credits. MTTh VIII. Ar. Mr. Koos.
- 124f. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. Prerequisites: 10 hrs. in education. MWF IX; 205Ed. Mr. Engelhardt.
- 125w-126s. City School Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration. Prerequisite: Ed. 124, 111. Six credits. MWF IX; 205Ed. Mr. Engelhardt.
- 127s. The City School Superintendent. A practical consideration of the duties of the superintendent: history; qualifications; present status; relations to the board of education, the staff, the pupils, and the public; types of administrative procedures; records; reports; professional ethics. Prerequisite: 10 hrs. in education. Two credits. S I, II. Mr. Peik.

- 128f,w,s. 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. Prereq., Ed. 124-125-126 or equivalent. One credit. Ar. Mr. Engelhardt.
- 160f. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete applications to present day problems; case studies. Prerequisite: 15 or equivalent. Two credits. S III, IV. Mr. Brueckner.
- 161aw. 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. Prerequisite: Ed. 15 or equivalent. Two credits. S III, IV. Ar. Mr. Brueckner.
- 161bf. Elementary School Supervision. The adjustment of the curriculum to the abilities of pupils in the elementary school; methods of classifying pupils according to achievement and intelligence. Prerequisite: Ed. 15 or equivalent. Two credits. W VIII, IX. Ar. Mr. Peik.
- 162as. 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. Prerequisite: Ed. 15 or equivalent. Two credits. S III, IV. Ar. Brueckner.
- 162b. Supervision of Social Sciences in the Elementary Schools. The scientific work being done on the course of study; in geography, history, science, and related fields; improvement of instruction in social sciences in the elementary schools. (Not offered in 1925-26.)
- 162c. Supervision of Arithmetic in the Elementary Schools. The improvement of instruction in arithmetic; the evaluation of the course of study; standardized drill exercises; diagnosis of specific pupil difficulty and remedial work; tests as aids of teaching. (Not offered in 1925-26.)
- 164w. High School Administration. A study of elimination from school, secondary vocational education, the marking system, classification of students, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building, costs. Prerequisite: 10 hrs. in education, including Ed. 55. Three credits. MTTh VIII. Ar. Mr. Koos.
- 167w-168s. Junior High School. A study of the special purposes of this institution and the appropriate reorganizations to achieve them; the history of the movement. Prerequisites: 10 hrs. in education, including Ed. 55. Four credits. W IX, X; Ar.
174. Public School Finance. A critical study of problems of federal and state aid to public schools; sources, methods, principles, needed reforms. Students are strongly advised to take as preparatory or in conjunction with this course Economics 191f-192w, Public Finance, and Education 126-127w, Methods of Educational Research. (Not offered 1925-26.)

- 175s. City School Finance. Study of the problems of school support peculiarly related to the city district; municipal school funds, sources and expenditures; analysis of unit costs, comparative cost accounting systems, budgets, financial records and reports. Prerequisites: 124, 125. Three credits. MWF VIII; 205Ed. Mr. Engelhardt.
- 178f-179w. 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. Six credits. MWF, VIII. Ar. Mr. Engelhardt.
- 205f-206w-207s. Seminar in Educational Administration. Prerequisites: 124-125-126, 160-161-162. Six credits. Ar. Mr. Engelhardt.
- 215-216-217. Seminar in Public Education in the United States. Research course devoted to intensive study of certain factors determining the problem of public education in the United States. The following may be considered typical problems: school support, school supervision, administrative units. (Not offered in 1925-26.)
- 218f-219w-220s. Seminar in Secondary School Problems. Th IX, X; 111Ed. Mr. Koos.

AGRICULTURAL EDUCATION

Prerequisites.—For major or minor work, 18 credits in agricultural education and preparation in agricultural subjects satisfactory to the Department of Agricultural Education.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 131w,s. Methods in Teaching High School Agriculture. Prerequisite: Agricultural Education 11. Five credits. MTWThF III; 317Ad.F. Mr. Field, Mr. Lathrop.
- 141w,s,su. 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. Prerequisite: 11. Three credits. Mr. Field, Mr. Lathrop.
- 151w,s. Organization and Management. Organization and management of work in secondary schools, particularly of Minnesota, with special reference to agricultural work, courses of study, programs, equipment, laboratory and class management, extension work, plots, and co-ordination of work. Prerequisite: Agricultural Education 11, 21. Five credits. MTWFS IV; 317Ad.F. Mr. Storm, Mr. Lathrop.
- 153f,s. Consolidated Rural Schools. To prepare principals to meet the problems peculiar to consolidated rural schools. Prerequisite: Agricultural Education 11. Three credits. Ar. Mr. Dyer.
154. Rural Education and Community Life. The rural school as a community center for educational, social, and recreational work. Prerequisite: Agricultural Education 11. Three credits. Ar. Mr. Dyer.

155. Consolidated Rural School Problems. Opportunity for intensive study and research in special problems of administration and supervision of village and consolidated rural schools. Prerequisites: 11, 153, or equivalent. Three credits. Ar. Mr. Dyer.
- 171w,s. 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. Prerequisites: 131, 41, 42. Three credits. Mr. Lathrop, Mr. Field.
- 176s. Problems in Visual Presentation. Based on Course 75. Further work in design and construction of charts and lantern slides. Special study of motion picture machines. Actual practice in effective use of visual aids in lecture and recitation. Prerequisite: 75. Three credits. Ar. Mr. Field.
- 191f-192w-193s. Seminar in Agricultural Education. Individual investigation and research; review and interpretation of current educational literature. Prerequisite: Agricultural Education 11. Two credits each. Mr. Storm, Mr. Field, Mr. Lathrop.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Seminar. Study of the broader administrative problems and policies in the field of agricultural education. Opportunity for independent investigation and research. One to 2 credits per quarter. 209Ad(F). Mr. Storm, Mr. Field, Mr. Lathrop, Mr. Dyer.
- 221f-222w-223s. Graduate Problems. Making investigations, gathering data, and formulating plans regarding agricultural education. Three credits. 209Ad(F). Mr. Storm, Mr. Dyer, Mr. Field, Mr. Lathrop.
- Agri. Educ. 241f. Operation of Vocational Agriculture. Problems involved in the state and local activities in conducting vocational agriculture. It includes a study of federal and state laws and regulations, courses of study, duties of the state supervisor, reports, records, and conferences. Two credits. Mr. Storm, Mr. Field, Mr. Lathrop.
- Agri. Educ. 242w,243s. Organization and Administration of Teacher-Training for Vocational Agriculture. Development of teacher-training institutions, agricultural college curricula, professional needs of high school teachers, professional courses and their content, equipment, itinerant teacher-training, practice teaching, teacher evaluation. Mr. Storm, Mr. Field, Mr. Lathrop.

EDUCATIONAL PSYCHOLOGY

- 106f-107w-108s. Advanced Educational Psychology. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical learning experiments. Study of group and individual differences, and their relations to educational practice. Prerequisite: 55 or equivalent. Nine credits. MWF III; Mr. Van Wagenen.

- 111s. Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests. Prerequisite: 55 or equivalent. Three credits. MWF II. Mr. Van Wagenen.
- 111Tf-112Tw. Educational Diagnosis. Same as above for teachers. Four credits. S I, II. Mr. Van Wagenen.
- 116af. Elementary Statistical Methods. Designed to supply the immediate statistical technique necessary for the pursuit of studies in education.
- 116f. Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course or 116a is ordinarily required of all candidates for advanced degrees. Two credits. T IX, X. Mr. Van Wagenen.
- 117w-118s. 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. Prerequisite: 116. Four credits. T IX, X. Mr. Van Wagenen.
- 130s. 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. Prerequisite: Psych. 1, 2, or 6. Two credits. F IX, X. Mr. Paterson.
- 134f-135w-136s. Mental Tests and Mental Diagnosis. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of individual and group mental tests. A critical study of group tests. Technique of classification of students by means of mental tests. Prerequisite: 55 or equiv. Six credits. MW VII, VIII. Mr. Miller.
- 138w-139s. 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 191w or 106-107-108. Prerequisite: 55. Four credits. WF IX, X. Mr. Rockwell.
- 143f-144w-145s. Individual Mental Examination. For teachers of sub-normal children. Demonstration and practice in mental diagnosis. Careful study will be made of different groups and systems of mental tests, and other clinical methods with discussion of general theory involved. Prerequisite: 55. Six credits. S I, II.
- 149f-150w-151s. Psycho-Educational Clinic. Conducted in co-operation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. Prerequisite: Ed. 134-135-136 or equivalent. Two to six credits. MWF 2:00-4:00.

- 153f-154w-155s. Research Problems. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. Ar. Mr. Haggerty, Mr. Miller, Mr. Van Wagenen.
- 184f-185w-186s. 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. Prerequisite: 55. Six credits. S III, IV. Mr. Rockwell.
- 191w. Systematic Educational Psychology. Advanced course covering the field of psychology as related to education. Open to seniors and graduate students. Not open to students who receive credit for Educational Psychology 106-107-108. Prerequisite: twelve credits in psychology and educational psychology. Four credits. MTThF III. Mr. Rockwell.
- 192f. The Psychology of Behavior Problems in Children. Prerequisite: fifteen credits in psychology and education. Two credits. S III, IV. Mr. Blanton.
- 193s. Speech Disorders of Public School Children. Prerequisite: fifteen credits in psychology and education. Two credits. S III, IV. Mr. Blanton.
- 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. (Not offered in 1925-26.)
- 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. M IX, X. Mr. Haggerty, Mr. Miller, Mr. Rockwell, Mr. Van Wagenen.

HISTORY AND PHILOSOPHY OF EDUCATION

- 101f. 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. Prerequisite: six credits in psychology and six credits in history. Three credits. MWF VIII; 208OL. Miss Alexander.
- 102w. 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. Prerequisites: six credits in psychology and six credits in history. Three credits. MWF VIII; 208OL. Miss Alexander.
- 103s. 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. Prerequisites: six credits in psychology and six credits in history. Three credits. MWF VI; 208OL. Miss Alexander.

114. Philosophy of Education. A discussion of philosophically formulated ideals of education with an attempt to reach a positive philosophy of educational values. (Not offered in 1925-26.)
- 129-130. Educational Classics. An intensive study of selected writings of educational leaders; first quarter, Plato, Aristotle, Quintilian, Comenius, Locke; second quarter, Rousseau, Pestalozzi, Herbart, Froebel, and Dewey. Students may register for either quarter. (Not offered in 1925-26.)
- 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. (Not offered in 1925-26.)
- 187f-188w-189s. Seminar in Educational Sociology. The sociological foundations of educational theory will be discussed, with the investigation of specific problems. Prerequisite: Ed. 1 or 101-102-103 and 3. Six credits. S I, II; 206OL. Mr. Finney.
- 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. (Not offered in 1925-26.)

HOME ECONOMICS EDUCATION

Professor Wylle B. McNeal.

Prerequisites.—For a major, 24 credits in general psychology, educational psychology, and undergraduate education courses, and preparation in home economics subjects satisfactory to the adviser.

For a minor, the prerequisites for the courses pursued must be met.

- 141f,s. Home Economics Problems in Vocational Education. The place and development of home economics in the vocational education program. Study of problems of the all day, evening, and part time schools. Prerequisite: H.E.Ed. 42. Two credits. Hours and days ar. Miss McNeal, Miss Brown.
- 142s. Educational Measurement in Home Economics. Survey of accomplishment in this field; evaluation and construction of objective tests. Prerequisite: Ed.Psy. 55, H.E.Ed. 42. Two credits. Hours and days ar. Miss Brown.
- 242f,w,s. Home Economics Education Seminar. Current problems in home economics education will be studied. Required of all candidates majoring in home economics education. One credit. Hours and days ar. Miss McNeal, Miss Brown.

THEORY AND PRACTICE OF TEACHING

118. Problems in Junior High School English. Study of the problems in teaching, reading, literature, and composition in upper grammar grades and junior high schools. (Not offered in 1925-26.)

- 193f. Foundations of Secondary School Methods. A study of the investigations which form the bases of the technique of high school instruction, and the application of their results to high school subject-matter and to high school classroom procedure. Prerequisite: Ed. 15. Three credits. MWF VIII. Ar. Mr. Hudelson.
- 195w. Problems of High School English Teaching. An intensive study of various means of adapting subject content to high school pupils; observations; classroom experiments; conferences with classroom teachers; pupil advisory work; submission of proposals of special methods. Prerequisite: Ed. 15 and 21. Two credits. S III, IV; 112Ed. Mr. Hudelson.
- 222f-223w-224s. Research Problems in Secondary Education. Prerequisite: Ed. 15 and 113. Two credits. Ar. Mr. Hudelson.
- 225f-226w-227s. Seminar in Elementary School Problems. T IX, X. Ar. Mr. Brueckner.

TRADE AND INDUSTRIAL EDUCATION

- Ind.110w. Guidance in the Schools. The history of the guidance movement; typical public school means and methods; the presentation of occupational information; the junior wage earning situation; attendance, child-labor and continuation laws; placement and follow-up plans. Prerequisite: Ed.Psy. 134. Two credits. S III, IV; 210OL. Mr. Smith.
- Ind.150f-151w-152s. Seminar in Vocational Education. Survey of studies in the field, individual and group investigation, reports, and criticisms. Required of all students writing theses in the special field of industrial education, general or vocational. Six credits. T 7:30-9:30 p.m.; 206OL. Mr. Prosser.
- Ind.171f. 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. Two credits. Th IX, X; 210OL. Mr. Craigo.
- Ind.172w. 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. Prerequisite: 171. Two credits. W IX, X; 210OL. Mr. Bass.
- Ind.173s. Administration of Industrial Education—Part Time Classes. A study of the new movement for part time education. Social and economic background, methods of organizing classes, a study of the special student groups, courses of study. Typical schools, comparative state legislation and plans. Minnesota's problems. Prerequisite: 172. Two credits. M IX, X; 210OL. Mr. Prosser.

ELECTRICAL ENGINEERING

Professors George D. Shepardson, Frank W. Springer, William T. Ryan;
Assistant Professors Cyril M. Jansky, Jr., John H. Kuhlmann.

Prerequisites.—For major work, Courses 121 to 126 or their equivalent; for minor work, 6 credits in physics, also integral calculus.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 111f-113w-115s. Electrical Machinery. Prerequisite: one year in college physics, three credits per quarter. MWF 9:30. Mr. Springer.
- 112f-114w-116s. Electrical Machinery Laboratory. To be taken with Course 111-113-115. Lectures and practice. Prerequisite: Physics 41-42. Two credits per quarter. Mr. Springer.
- 121f-123w-125s. Alternating Currents. Prerequisite: Electrical Engineering 115. Three credits per quarter. MWF 10:30 or 11:30. (Two sections.) Mr. Ryan.
- 122f-124w-126s. Alternating Current Laboratory. To be taken with Course 121-123-125. Prerequisite: Electrical Engineering 116. Two credits per quarter. Mr. Springer.
- 127f. Transient Electrical Phenomena. Mathematical study of the electric circuit containing resistance, inductance, and capacity. Abnormal currents and voltage upon switching circuits containing iron core inductances. Prerequisite: Electrical Engineering 121. Two credits. Mr. Jansky.
- 128w. Transient Electrical Phenomena. Current and voltage distribution in circuits containing distributed resistance, inductance, and capacity. Distortion in telephone lines and its correction. Prerequisites: Electrical Engineering 127. Two credits. Mr. Jansky.
- 129s. Transient and High Frequency Phenomena. Transient phenomena in coupled circuits. Distribution of current and flux in conductors at high and low frequencies. Change of resistance with frequency. Theoretical study of special problems. Prerequisites: Electrical Engineering 128. Two credits. Mr. Jansky.
- 132f-134w-136s. Electrical Design. Prerequisite: Electrical Engineering 115. To be taken with Course 121-123-125. Two credits per quarter. Mr. Kuhlmann.
- 141f. Central Stations. Operation, design, and construction of electric power generating stations. Prerequisite: Electrical Engineering 115. Two credits. ThS 10:30. Mr. Ryan.
- 142w. Electrical Transmission. Prerequisite: Electrical Engineering 141. Two credits. ThS 10:30. Mr. Ryan.
- 144w. Railway Electrical Engineering. Prerequisite: Electrical Engineering 115 or 45. Two credits. MW 11:30.
- 145s. Steam Railroad Electrification. Prerequisite: Electrical Engineering 144. Two credits. MW 11:30.
- 151f. Electric Lighting. Lectures, problems, and laboratory practice. Prerequisite: one year in college physics. One credit.

- 152f. Photometric Laboratory. Photometric studies of incandescent and arc electric lamps, gas and oil lamps. Bench and radial photometers and illuminometers. To be taken with Electrical Engineering 151. One credit.
- 161f. Radio Communication. Phase relations in high frequency circuits. Mathematical theory of damped wave transmission and receiving circuits. Inductance and capacity measurements using damped waves. The electron tube as a detector and amplifier. Signal Corps apparatus. Prerequisite: registration in Electrical Engineering 121. Three credits. ThS 8:30. Laboratory sections. Mr. Jansky.
- 162w. Radio Communication. Theory and measurement of logarithmic decrement. Undamped wave transmitting and receiving circuits. Heterodyne reception. The arc, high frequency generator, and electron tube as sources of high frequency power. High frequency measurements, using undamped waves. Prerequisite: Electrical Engineering 161. Three credits. ThS 8:30. Laboratory sections. Mr. Jansky.
- 163s. Radio Communication. Mathematical theory of the electron tube and its use in the radio circuit. Design of electron tube oscillator and amplifier circuits. Radio telephony, modulation, carrier frequency. Direction-finding apparatus and selective circuits for interference elimination. Prerequisite: Electrical Engineering 162. Three credits. ThS 8:30. Laboratory sections. Mr. Jansky.
- 164f. Telegraph and Telephone Apparatus. Theoretical and experimental study of apparatus used for signaling, telegraphy, and telephony. Lectures and laboratory. Prerequisite: to be taken with Course 121. Two or three credits. Mr. Shepardson, Mr. Swenson.
- 165w-166s. Telegraph and Telephone Circuits. Theoretical and experimental study of telegraph and telephone circuits and the phenomena of long line transmission. Prerequisite: Course 164. Two credits per quarter. Mr. Shepardson, Mr. Swenson.
- 167f-168w-169s. Radio Station Operation. For men already proficient, licensed radio operators. Open only to a limited number by permission. One or two credits per quarter. Mr. Jansky.
- 183f-184w-185s. Electrical Laboratory. Efficiency tests and special problems. Prerequisite: Electrical Engineering 126. Credits as arranged. Mr. Shepardson, Mr. Springer.
- 186w or s. High Tension-Testing. Low frequency pressure up to 320,000 volts and high frequency to several million volts applied to the study of dielectric phenomena, testing of high tension equipment, etc. Prerequisite: Electrical Engineering 124. Two credits. Mr. Springer.
- 187f, 188w, 189s. Special Communication Laboratory. Special problems in electrical communication. Open by permission to qualified students. Includes weekly seminar meeting. One to twelve credits total.
- 191f-192w-193s. Journal-Reading. Weekly discussion of current electrical periodicals. Prerequisite: Electrical Engineering 115 or equivalent. No graduate credit. Mr. Shepardson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 232f-234w-236s. Electrical Design. Special problems. Prerequisites: Electrical Engineering, 125, 136. Credits as arranged. Mr. Ryan, Mr. Kuhlmann.
- 237s. Electric Power Transmission Design. Preparation of detailed plans and specifications for the construction of high voltage transmission lines and distributing systems. Economic, electrical, and mechanical principles and calculations. Mr. Ryan.
- 251w-253s. Illuminating Engineering. Lectures and laboratory work. Methods of determining location, kind, and quality of lights for obtaining desired illumination. Prerequisite: Electrical Engineering 151. Two credits per quarter. Mr. Shepardson.
- 281w-282s. Advanced High Frequency Measurements. Vector treatment of circuit networks. Bridge circuits for the measurement of resistance, inductance, and capacity at audio and radio frequencies. Prerequisite: Electrical Engineering 126. Two credits per quarter. Mr. Jansky.
- 284f-285w-286s. Precise Electrical Engineering Measurements. Lectures and laboratory work. Open to a limited number subject to approval. Prerequisites: Electrical Engineering 123, 124. One or two credits. Mr. Springer.
- 275f-276w-277s. Electrical Engineering Research. Investigation of special problems in laboratory or library. Prerequisite: Electrical Engineering 126. Two to four credits per quarter. Mr. Shepardson, Mr. Springer, Mr. Ryan, Mr. Jansky, Mr. Kuhlmann.
- 291f-292w-293s. Graduate Seminar. Discussions of problems and results of research work. One credit per quarter. Mr. Shepardson, Mr. Jansky.
- 294f-295w-296s. Electrical Ignition and Automobile Electrical Accessories. The study of ignition apparatus; characteristics of automobile accessories, such as generators, starters, controllers, etc. Laboratory and lectures. Prerequisite: Electrical Engineering 121 or equivalent. Two credits per quarter. Mr. Springer.
- G.E.111s. Valuation of Public Utility Properties. Factors affecting value, depreciation, taxation, and regulation of public utility properties. Elements of engineering economics; cost analysis, economic investigations, rate-making. Open only to seniors and graduates. One credit. Mr. Ryan and non-resident lecturers.
- G.E.124w. Engineering Relations. Lectures, assigned reading, and discussions on the human side of engineering. Relations of the engineer to employer, employees, customers, and public. Engineering code of ethics. Bridging between college and business. Practical training of engineering graduates. Open only to seniors and graduates. Mr. Shepardson and non-resident lecturers. (Not offered in 1925-26.)

ENTOMOLOGY AND ECONOMIC ZOOLOGY

Professors Royal N. Chapman, William A. Riley, Arthur G. Ruggles, Frederic L. Washburn; Assistant Professors Samuel A. Graham, Oscar W. Oestlund.

Prerequisites.—Eighteen credits in animal biology and entomology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 117f-118w-119s. General Ecology of Insects. General ecology with special reference to the insects of Minnesota. Frequent field trips. Lectures, laboratory, and field work. TTh V-VII; 208-210AB. Mr. Chapman.
- 124su. Advanced Ecology. Similar to 117-118-119 with special field work. Mr. Chapman.
- 125f-126w-127s. Advanced General Entomology. Morphology and classification of insects with lectures on the history of entomology. Lectures and laboratory. TThS III, IV; 208-210AB. Mr. Oestlund.
- 130w. Biology and Taxonomy of the Aphididae. Intensive study of the natural history, bibliography, and classification of the Aphididae. Additional work is offered under Course 175. MWF III, IV; 208-210AB. Mr. Oestlund.
- 139-140. History 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 under Course 197. TTh II-IV, and ar.; 211AB(F). Mr. Riley.
- 144f-145w-146s. Animal Parasites and Parasitism. Lectures and laboratory work. Second term devoted primarily to the relation of insects to diseases of man and animals. WF V-VII; 208-210AB. Mr. Riley.
- 150su. Insecticides and Their Action. Ar.; Insectary (F).
- 197f,w,s,su. Introduction to Research. Preparation for investigational work in lines of entomology, parasitology, or economic zoology. Summer work should be planned when possible. Mr. Riley, parasitology, insect morphology; Mr. Ruggles, general economic entomology; Mr. Washburn, economic vertebrate zoology, insecticides; Mr. Oestlund, systematic entomology.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-204. Research in Entomology. Mr. Riley, Mr. Chapman, Mr. Oestlund
- 205-208. Research in Economic Entomology. Mr. Ruggles, Mr. Graham
- 209-212. Research in Economic Vertebrate Zoology. Mr. Washburn.
- 261-264. Research in Parasitology and Medical Entomology. Mr. Riley.
- 265-268. Research in Insecticides.

EXPERIMENTAL ENGINEERING

Professors Frank B. Rowley, William E. Brooke, John J. Flather, William F. Holman; Associate Professors Jacob O. Jones, Fred C. Lang, Charles F. Shoop; Assistant Professors Maurice B. Lagaard, George A. Maney, George C. Priester, Burton J. Robertson.

NOTE.—Experimental work relating to various branches of engineering may be carried on in the Experimental Engineering laboratories. The following courses are offered by the departments indicated. Work of a special character, such as advanced research, may be arranged through consultation with the director, Professor Rowley.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- M.M.141f,w,s. Materials-Testing Laboratory. Investigation of the physical properties of various metals and engineering materials. One credit. Mr. Brooke, Mr. Holman, Mr. Priester.
- M.M.143f,w,s. Hydraulic Laboratory. Experimental and demonstrational work. One credit. Mr. Jones.
- M.M.192w. Hydraulic Motors Laboratory. An experimental study of the characteristics of the hydraulic ram, centrifugal pump, reaction turbine, and impulse wheel. Three credits. Mr. Jones.
- M.M.193s. Hydraulic Measurements. A detailed study of the current meter, Venturi meter, weir, orifice, traveling screen, chemical method of gaging, etc. Three credits. Mr. Jones.
- M.E.181w. Advanced General Laboratory. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. (Senior mines.) Four actual hours. Mr. Rowley, Mr. Shoop.
- M.E.182f. Advanced Steam Laboratory. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compounds and triple expansion engines, condensers, superheaters, and boilers. Two credits. Mr. Shoop.
- M.E.183w. Power and Gas Engine Laboratory. Tests of gas, gasoline, and hot air engines, gas producers. Power and lighting plants. Two credits. Mr. Rowley, Mr. Robertson.
- M.E.184s. Advanced Engineering Laboratory. Opportunity will be offered for carrying on investigations in connection with tests of complete power plants, refrigerators, air compressors, blowers and fans. Also automobile testing and gas engine investigations. Two credits. Mr. Rowley, Mr. Shoop, Mr. Robertson.
- C.E.146f,w,s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Three credits. Prerequisite: M.M.141. Mr. Lagaard.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- C.E.237w-238s. Structural Laboratory. Similar to Course 243, but dealing mainly with experimental problems in structural steel. Mr. Lagaard, Mr. Maney.
- C.E.243w-244s. Cement and Concrete Laboratory. Laboratory technique and experimental investigation of special problems in cement, concrete, and reinforced concrete. Mr. Lagaard.
- C.E.251. Highway Laboratory. Investigations in co-operation with State Highway Department. Mr. Lang.

C.E.263. Hydraulic Laboratory. Study of special hydraulic problems in laboratory, drafting room, and field. Mr. Jones.

M.E.287-288-289. Research in Mechanical Engineering. Courses may be elected which involve investigations in connection with steam and gas engines, heating, and ventilating. Reports, special problems, and related tests. Three to nine credits. Mr. Rowley, Mr. Flather, Mr. Shoop, Mr. Robertson.

ENGLISH

Professors Joseph M. Thomas, Joseph W. Beach, Frederick Klaeber (Comparative Philology), Cecil A. Moore, Frank M. Rarig, Elmer E. Stoll; Associate Professor Martin B. Ruud; Assistant Professors Muriel B. Carr, Charles W. Nichols, Emerson G. Sutcliffe,¹ Cortlandt van Winkle.

Before registering for graduate courses, students should consult with the director of graduate work for the department, Mr. Moore.

Before the acceptance of his subject for a thesis, a candidate for the M.A. or the Ph.D. degree must have given evidence to the department that he speaks and writes English with propriety.

REQUIREMENT FOR MASTER OF ARTS DEGREE

1. *Prerequisite*.—For major work, not less than 27 credit hours in the subject, including satisfactory introductory courses in Old English and either Chaucer or Shakespeare.

If English is offered as a minor, not less than 27 credit hours in the subject.

2. A candidate is not permitted to count toward the degree more than one course running through the year (or its equivalent) the primary purpose of which is practice in writing.

REQUIREMENTS FOR DOCTOR OF PHILOSOPHY DEGREE

1. *Delimitation of the field*.—The general field of English is divided into two periods (1) Early English and (2) Modern English. The boundary line between these periods may be drawn anywhere between 1500 and 1550 according to the requirements of the candidate's program. A candidate may select as his major subject either the Early English or the Modern English period.

2. The candidate will be examined as to his knowledge of the whole field of English literature, but much more thoroly in that portion of the field covered by his major. Special emphasis will be laid, in the final examination, on one particular period or one particular type (such as drama, lyric, or essay) with which he is presumed to be especially familiar. This particular period or type would naturally be that connected with his thesis.

3. The candidate must have completed, before examination, advanced courses in Chaucer and Shakespeare.

4. A good reading knowledge of Latin is in all cases desirable, and in some cases may be indicated by the candidate's adviser as indispensable.

¹ Absent on leave, 1925-26.

COURSES IN ENGLISH

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Introduction to Middle English. An outline of Middle English grammar, including the interpretation of selected texts. Prerequisites: English 6 and 50. Two credits. TTh VI; 217F. Mr. Klaeber.
- 103s. Beowulf. An introduction to the Old English poem, with reading of considerable portions of the text. Prerequisites: either Course 6 or 8 and 50. Three credits. MWF VI; 217F. Mr. Klaeber.
- 105w-106s.† Eighteenth-Century Poetry. From Pope to Burns, with special reference to the rise and growth of romanticism. Prerequisites: Courses 6 and 8 or either 6 or 8 and one other course numbered above 5. Six credits. MWF VII; 205F. Mr. Moore.
- 107w-108s.† Eighteenth-Century Prose. Special study of fiction and the essay. Prerequisites: Courses 6 and 8 or either 6 or 8 and one other course numbered above 5. Six credits. MWF VII; 204F. (Not given in 1925-26.) Mr. Moore.
- 109f-110w.† The Romantic Poets of the Nineteenth Century. From Wordsworth to Keats. Prerequisites: Courses 6 and 8 or either 6 or 8 and one other course numbered above 5. Six credits. TThS III; 204F. Mr. Beach.
- 111f-112w.† Seventeenth-Century Prose. General survey of the prose of the century to 1660. History 4-5 is desirable as preparation for this course. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Six credits. MWF III; 204F. Mr. Moore.
- 123f-124w-125s.† The Technique of the Novel. Special studies in novels of the late nineteenth and twentieth centuries, with particular regard to structure. In 1925-26, Meredith, George Moore, Conrad, and Galsworthy. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Nine credits. T 4:00 to 6:00 p.m.; 204F. Mr. Beach.
- 129s. Modern Drama. Contemporary drama from 1870 to the present. Prerequisites: Course 8 and one other course numbered above 5. Four credits. MWThF II; 321F.
- 133w. The English and Scottish Popular Ballads. A study of a large number of traditional ballads, English and foreign, and of ballad style and origins. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Three credits. MWF III; 205F. Mr. Ruud.
- 136s. Advanced Shakespeare. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. Prerequisite: Grade of B in English 8. Four credits. TThFS I; 205F. Mr. Stoll.
- 140s. Advanced Chaucer. The more important poems (except those read in Course 6). The treatment will be primarily literary and historical, linguistic proficiency being presumed. Prerequisites: Course 6 and one other course numbered above 5 (or 6 with a grade of B). Four credits. TWThS II; 205F. Mr. Ruud.

- 141f-142w-143s. Historical Grammar of the English Language. This course is identical with Comparative Philology 141-142-143. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Six credits. Mr. Klaeber.
- 146f-147w. The Metrical Romances. The more important Middle English romances of the non-Arthurian cycles. Prerequisites: Course 6 and one other course numbered above 5. Six credits. MWF VII; 205F. (Not given in 1925-26.)
- 148f-149w. Arthurian Romances. An introduction to the great stories of love and chivalry connected with King Arthur and the Round Table. Prerequisites: Course 6 and one other course numbered above 5. Six credits. MWF VIII; 205F.
- 150f. Victorian Poetry. The poetry of the Victorian era, aside from Browning's and Tennyson's. The principal names are: Matthew Arnold, the Rossettis, Fitzgerald, Morris, Swinburne, and Meredith. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Four credits. MTWF VII; 205F. Mr. Stoll.
- 151s. Recent Poetry. Poetry in England and America since the death of Queen Victoria. The main tradition and tendencies now prevailing. Prerequisites: Courses 6 and 8, or either 6 or 8 and one other course numbered above 5. Four credits. TWThS III; 204F. Mr. Beach.
- 152w-153s.† Pre-Elizabethan Drama. The late medieval and the Renaissance drama, moralities, interludes, and farces up through the earlier years of the Elizabethan period. Prerequisites: Course 8 and one other course numbered above 5. Six credits. TThS III; 205F.
- 155s. The American Novel. The history of the American novel from the beginning to the present. Prerequisites: Course 6 or 8 and 44-45. Four credits. (Not given in 1925-26.) Mr. Moore.
- 164s. Dante in English. See Italian 164s. Three credits. MWF IV; 203F. Miss Phelps.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f. Old English. Comparative study of Anglo-Saxon (Old English) grammar and reading of prose texts. Once a week, two hours. Three credits. Mr. Klaeber.
- 202w-203s. Old English Poetry. Critical reading of poems. Once a week, two hours. Six credits. Mr. Klaeber.
208. Piers the Plowman. A study of critical problems relating to the text and authorship. Three credits. (Not given in 1925-26.)
- 209f-210w-211s. The Middle English Lyric. (Not given in 1925-26.)
- 213f-214w-215s. Seminary in Eighteenth-Century Drama. Special attention will be given to the rise and progress of sentimental comedy and domestic tragedy. Nine credits. Th 4:00 to 6:00 p.m. Mr. Moore.
218. Seminary in the Restoration Drama. The drama from the Restoration to the rise of sentimental comedy. Special attention given to the comedy of manners (from Etherege to Farquhar) and its relation to the life of the time. Nine credits. (Not given in 1925-26.) Mr. Stoll.

- 220f-221w-222s. Seminary in Medieval Drama. Nine credits. (Not given in 1925-26.) Mr. Ruud.
- 225-226-227. Seminary in Elizabethan Drama. Elizabethan and Jacobean dramatists, from Lyly to Shirley. Problems assigned may involve Shakespeare, and in general his contemporaries will be studied less for their own sakes than for the light they shed upon him. Nine credits. (Not given in 1925-26.) Mr. Stoll.
- 228-229-230. Seminary in Eighteenth-Century Novel. The rise and development of the novel as a form of literature; the use made of the novel as a medium for religious, social, and political theory. Nine credits. (Not given in 1925-26.) Mr. Moore.
- 231f-232w-233s. Shakespeare's Tragic and Comic Art. Nine credits. M 4 to 6 p.m. Mr. Stoll.
- 234f-235w-236s. Seminary in Middle English Alliterative Poetry. A literary and linguistic study of selected Middle English alliterative poems. Nine credits. (Not given in 1925-26.) Mr. Ruud.
- 237f-238w-239s. Seminary in Chaucer. A study of some of the important problems in the Chaucer canon and in the works of Chaucer. Nine credits. W 4:00 to 6:00 p.m. Mr. Ruud.
- For courses in Comparative Literature see page 39.

COURSES IN COMPOSITION

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100w-101s.† Versification. The nature of poetry and a detailed analysis of English meters and the various English verse forms. The theory accompanied by criticisms of current poetry and practice in writing verse. Prerequisites: Course 11-12 or 18-19, 20; with or after 9 credits in English poetry. Six credits. (Not given in 1925-26.) Mr. Nichols.
- 111f-112w-113s. Essay-Writing. Practice in writing didactic, biographical, critical, and informal essays. Analysis of a considerable body of modern essays. Prerequisites: Courses 11-12 or 18-19, and 20. Nine credits. (Not given in 1925-26.) MWF III; 304F. Mr. Sutcliffe.
- 115f-116w-117s. Dramatic Technique. Principles of plotting, characterization, climax, dialog, and scenario-making. Writing of three plays—two original, one dramatized short story. Required readings, laboratory work, criticism of local productions. Open to those who have taken Course 11-12 and have taken or are taking English 129. Nine credits. (Not given in 1925-26.)
- 119f-120w-121s. Seminary in Writing. Open to advanced students who write with facility and who desire personal direction. Criticism of manuscripts submitted. Prerequisites: 9 credits in senior college courses, and permission of instructor. Nine credits. Th VI, VII; 304F. Mr. Thomas.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Seminary in Rhetoric. (Graduate seminary but open to seniors taking the Honors Course.) For those who are specializing

in rhetoric and composition. Prerequisites: Course 11-12 or 18-19 and 9 additional credits in rhetoric. Nine credits. Mr. Thomas.

COURSES IN PUBLIC SPEAKING

- 101f-102w. Advanced Speech Composition. Emphasis on argumentative method, style, psychology of persuasion; study of models. Prerequisites: Course 41-42-43 or 45-46. Six credits. MWF III; 308F. Mr. Rarig.
- 105s. Theory of Reading and Acting. The forms of literature; literature regarded as an art; psychology of the creative imagination; speech elements in literature; technique governing use of auditory and visual symbols. Collateral readings, speech problems, reports, term papers. Prerequisites: Course 41-42-43 or 45-46. Three credits. MWF III; 308F. Mr. Rarig.

FORESTRY

Professors Edward G. Cheyney, John H. Allison; Associate Professor John P. Wentling.

Prerequisites.—For major work, 27 credits in forestry, three quarters of botany or equivalent. For minor work, 9 credits in the department.

Exemptions from the language requirement for the Master's degree may be made in individual cases.

The choice in subject must be made by the candidate and approved by the chief of the division and instructor. The facilities of the forest experiment stations at Cloquet and Itasca are available to students taking **this work.**

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w. Advanced Dendrology. A continuation of Course 3-4 with special studies in classification and distribution of the timber species of the world. Prerequisites: 10 credits in botany and 8 credits in dendrology. Three credits. TThS III; 301Hr. Mr. Wentling.
- 107f. Uses of Wood I. The economic hard and soft woods, both foreign and domestic from standpoint of regions of production, distribution centers, qualities, amounts, and prices in relation to the wood-using industries. Lectures, reading, reports. Prerequisite: 33-34. Three credits. MWF IV; 301Hr. Mr. Wentling.
- 108w. 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. Prerequisite: 33-34. Three credits. MWF IV; 303Hr. Mr. Wentling.
- 109s. 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. Prerequisite: 107-108. Three credits. TThS VI, VII, VIII; 303Hr. Mr. Wentling.

- 110f-111w. Mechanical and Physical Properties of Wood. Study of strength as related to density, quality, etc. Wood stresses, failures, and methods of testing timbers. 6 credits. Prerequisites: 33-34. TThS I, II; 203Hr. Mr. Wentling.
- 112w. 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. Ar. Mr. Hansen.
- 113w. Wood Pulps and Papers. A detailed study of production of wood pulp and paper products, naval stores, tannins, oils, wood distillation products, etc. Lectures, reading, reports. Prerequisites: 33-34, Chem. 3 or 10 and Chem. 36. Ar. 302Hr. Mr. Allison.
- 119f. Advanced Wood Structure I. A detailed study of the elements and structure of native and foreign economic woods. Preparation, sectioning, and mounting of typical sections. Reference reading and reports. Six hours per week. Prerequisites: Courses 33-34. Three credits. WF VI, VII, VIII; 303Hr. Mr. Wentling.
- 120w. Advanced Wood Structure II. Study of wood structure in relation to seasoning, mechanical failures, penetration or preservatives, variation in strength, etc. Six hours per week. Prerequisite: Course 119. Three credits. WF VI, VII, VIII; 303Hr. Mr. Wentling.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202. Research Problems in Science and Practice of Sylviculture. Mr. Wentling, Mr. Cheyney.
- 203-204. Research Problems in Management and Working Plans. Mr. Allison.
- 205-206. Lumber Markets and Prices. Mr. Cheyney.
- 207f-208w-209s. Research in Wood Technology. Mr. Wentling.

GEOGRAPHY

Associate Professor Darrell H. Davis.

Prerequisites.—For major work, Courses 1-2 or 51-52, 61, and 5 additional credits in Geography, Economics 1-2 or 6-7, and Geology 1, or 3 or 29. For minor work, 10 credits in the department.

Exemptions from the language requirement for the Master's degree may be made in individual cases.

101f,w,s. Research Problems in Geography. Credits and hours to be arranged. Mr. Davis.

GEOLOGY AND MINERALOGY

Professors William H. Emmons, Frank F. Grout, Clinton R. Stauffer; Assistant Professors John W. Gruner, George M. Schwartz; Instructor Ira S. Allison.

Prerequisites.—For major work in:

General geology and economic geology. Courses 1, 2 or 3, 21, 22; a knowledge of general chemistry. Course 105 must be carried along with other graduate work.

Petrology, Courses 1, 3, 21, 22, elementary chemistry and physics.

Paleontology, Courses 1, 11, or 91-92-93. Animal biology is a desirable antecedent.

A student selecting some branch of geology as a major will not be allowed to select general geology as a minor.

Exemptions from the language requirements for the Master's degree may be made in individual cases. Students who are deficient in modern languages are advised to take a language along with their graduate work. Examinations in French and German are required of candidates for service on the United States Geological Survey.

- 101f. Principles of Stratigraphy. Origin and structure of sedimentary deposits; the interpretation of these in relation to paleogeography; field work in connection with Cambrian and Ordovician problems. Ar. Three credits. Mr. Allison.
- 105f. Elements of Rock Study. Prerequisite: Course 22 or 25. Three credits. TTh VI, VII; 110P. Mr. Grout.
- 106w. Petrography. The identification and study of minerals and rocks by topical methods; the study of igneous rocks, crystalline schists, and metamorphic rocks. The origin and classification of rocks. Prerequisite: Course 105. Three credits. MF VII, VIII; 110P. Mr. Grout.
- 107f-108w-109s. Paleontologic Practice. The collection, preparation, and study of materials, with a view to gaining a working knowledge of groups of fossils, and the use of literature. Prerequisite: Course 59. Nine credits. MWF V, VII; 105P. Mr. Stauffer.
- 111f. 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. Prerequisites: Courses 10, 105. Three credits. TThS I; 110P. Mr. Emmons.
- 112w. Geology of Petroleum. First part treats deposits of metals, giving special attention to those outside of the United States. Second half treats the nature, origin, and distribution of petroleum and discusses the various oil fields of the world. Prerequisite: Course 111. Three credits. TThS I; 110P. Mr. Emmons.
- 113s. Problems in Ore Deposits. Field excursions, map work, lectures on field and laboratory methods. Prerequisite: Course 112. Three credits. Th VI-IX; 110P. Mr. Emmons.
- 124w-125s. Structural and Metamorphic Geology. The conditions, processes, and results of metamorphism; structural features resulting from deformation under varying conditions of load. Prerequisites: Courses 9 or 10, 105. Six credits. MWF VI; 200aP. Mr. Schwartz.
- 127f. 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. Prerequisites: 124-125. Three credits. Hours. ar. 104P. Mr. Thiel.
- 131f-132w-133s. Advanced Petrology. Advanced optical methods. Regional and genetic studies. Petrographic reports. Prerequisite: Course 106. Nine credits. TThS II-III; 200P. Mr. Grout.

- 137w. Testing Economic Minerals. Laboratory tests of coal, clay, oil, building stone, and metallic ores. Prerequisites: Courses 1, 105. Three credits. MT VI-VIII; 200P. Mr. Grout.
- 140w-141s. Applied Petrography. Determination of ore and gangue minerals, microscopic studies of paragenesis of ores and other mineral associations. Practical problems in mining and geology, settled by microscopic and optical examination. Prerequisite: Course 131. Six credits. MW I; MWF II; 200P. Mr. Grout, Mr. Gruner.
- 144w-145s. Construction and Interpretation of Geologic Maps. Methods of geological examination; study and problems in construction and interpretation of geological maps. Prerequisite: Courses 9 or 10. Six credits. TTh VII-IX; 104P. Mr. Allison.
- 149s. Methods of Field Geology. General methods of field work necessary for Course 150. Mr. Schwartz.
- 150s. Field Geology. Detailed, systematic work, conforming to official surveys. Reports to be written week before college opens. For prerequisites see members of the department. Credits arranged. Mr. Emmons, Mr. Schwartz.
- 151f-152w-153s. Advanced General Geology. Geologic processes and their results; development of the North American continent. Prerequisite: Course 9. Nine credits. MWF III. 104P. Mr. Stauffer.
- 166f-167w. Mineralography. Methods of studying opaque minerals and application of the methods to problems in ore genesis and history. Prerequisite: Course 111. Six credits. Hours to be arranged. 103P. Mr. Schwartz.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 211f-212w-213s. Advanced Paleontology. Selected groups of fossils. Class work supplemented by reference reading and thesis. Three credits. Mr. Stauffer.
214. Seminar in Ore Deposits. Three credits. Mr. Emmons.
- 215s. Geology and Ore Deposits of the Western Hemisphere. Open to graduate students and to those undergraduates who have had Course 111. Offered in spring quarter, 1926. Three credits. Mr. Emmons.
- 216s. Geology and Ore Deposits of the Eastern Hemisphere. Prerequisites same as for Course 215. Offered in spring quarter, 1926. Three credits. Mr. Emmons.
220. Glacial Geology. Hours to be arranged. The drift sheets, glacial lakes, the gorge of St. Anthony Falls, the dalles of the St. Croix, and other problems. Lectures, reference reading, and field work.
241. Field Course in Geology. To be arranged with individual students upon application to the department. Credit will be given for field work done satisfactorily as prescribed in the joint announcement of various universities.
- 243-244. Research Course in Geology. Advanced work in general geology; chiefly individual work on selected subjects. Data and collections of material gathered in the course of field work studied under instructor. Methods follow standards of federal and state surveys. Mr. Emmons, Mr. Grout, Mr. Stauffer.

246. Pre-Cambrian Geology. The problems of pre-Cambrian correlation and structure; the pre-Cambrian stratigraphy of North America. Given in alternate years. Three credits.
- 251-252. Original Problems. Morphology and physical measurements of minerals. Three credits each. Mr. Gruner.
- 253-254. Research Course in Ore Deposits. Methods of Course 243-244 applied to ore deposits. Three credits each. Mr. Emmons, Mr. Grout, Mr. Gruner, Mr. Schwartz.
- 263-264. Research Course in Petrology. Methods of Course 243-244 applied to petrology. Three credits each. Mr. Emmons, Mr. Grout.

GERMAN

Professors Carl Schlenker, Frederick Klaeber (Comparative Philology); Associate Professors Oscar C. Burkhard, Samuel Kroesch; Assistant Professors James Davies, George Lussky.

Prerequisites.—For major work, 27 senior college quarter credits or equivalent. For minor work, 18 senior college credits or equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f-101w-102s. Middle High German. Phonology, morphology, and syntax. Nine credits. MWF VI. Ar. Mr. Kroesch.
- 107f. Historical German Grammar. Phonology, inflection, word formation, syntax. Intended primarily for prospective teachers of German. Three credits. (To be given 1926-27.) Mr. Kroesch.
- 108s. Comparative Phonetics. A study of speech sounds and the nature of their production, with special reference to English, French, and German. Open to students in the modern languages. Three credits. MWF III; 217F. Mr. Kroesch.
- 109f-110w-111s. History of the German Language. Lectures, discussions, assigned readings. This course is identical with Comparative Philology 109-110-111. Nine credits. (To be given 1925-26.) Mr. Klaeber.
- 115-116-117. Middle High German Literature. The Niebelungen Lied, Court Epic, Minnesang. Nine credits. Ar. Mr. Kroesch.
- 140-141-142. Early High German Literature, 1500-1700. German literature from the Reformation and the Renaissance to the beginning of the modern High German classical period. Nine credits. T VII. Mr. Lussky.
- 150f-151w-152s. Die Novelle. A study of the technique and development. Assigned readings and reports. Nine credits. (Offered in 1926-27.) Mr. Burkhard.
- 153f-154w-155s. Studies in German Literature of the Nineteenth Century. Subject for 1925-26 Austrian Drama. Nine credits. Th VI, VII, VIII; ar. Mr. Burkhard.
- 160f-161w-162s. Lyric Poetry of the Eighteenth and Nineteenth Centuries. Nine credits. M VI, VII, VIII; 209F. (To be given 1926-27.) Mr. Davies.

- 163-164-165. German and English Literary Relations in the Sixteenth, Seventeenth, and Eighteenth Century. Nine credits. M VI, VII, VIII; 211F. (To be given 1925-26.) Mr. Davies.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 225f-226w-227s. Literary Problems. Subject for 1925-26. Schiller. For 1926-27; The Modern German Drama. Nine credits. W VI, VII, VIII; ar. Mr. Schlenker.

For description of the following courses see the statement of the Department of Comparative Philology.

- 202-203-204. Gothic. Mr. Klaeber.
205. Urgermanische Grammatik. Mr. Klaeber.
206-207-208. Old Saxon. Mr. Klaeber.
209-210-211. Old High German. Mr. Klaeber.

GREEK

Professor Charles Albert Savage.

Prerequisites.—For major work, Courses 105, 106 or 107, 108, or their equivalent. For minor work, Courses 51 (Philosophy), 52 (Oratory), 53 (Dramatic Poetry), or their equivalent.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 105f. Lyric Poetry. Selections from the elegiac, iambic, lyric, and bucolic poets. Three times a week. Prerequisites: Greek 51 and 53, or 52 and 53. Three credits. Ar. 112F. Mr. Savage.
106w. Advanced Drama. Aeschylus, Sophocles, or Aristophanes. Special attention given to the development of the drama, and to the literary form and dramatic representation of the plays read. Three times a week. Prerequisite: Greek 53 or 105 or equivalent. Three credits. Ar. 112F. Mr. Savage.
107w. Advanced Prose. Selections from the Greek historians, or from Plato, or from the orators. Alternates with Course 106. Equivalent prerequisites. Ar. 112F. Mr. Savage.
108s. Advanced Epic Poetry. A course of rapid reading in the *Iliad* or the *Odyssey*. Three times a week. Prerequisite: Greek 105 or 106. Three credits. Ar. 112F. Mr. Savage.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201-202-203. Oratory (advanced). A study of the development of oratorical style among the Greeks; selected readings. Twice weekly, one, two, or three quarters. Mr. Savage.
204-205-206. Dramatic Poetry (advanced). The reading and critical study of representative Greek plays. Twice weekly, one, two, or three quarters. Alternates with 201-202-203. Mr. Savage.
207-208-209. Seminar in Philosophy or Oratory. Once a week, one, two, or three quarters. Mr. Savage.

210-211-212. History (advanced). Selected readings from Greek historians. Once a week, one, two, or three quarters. Alternates with 207-208-209. Mr. Savage.

HISTORY

Professors Guy Stanton Ford, Solon J. Buck, William Stearns Davis, Norman Scott Brien Gras, August Charles Krey, Lester Burrell Shippee, Albert Beebe White; Assistant Professors Lawrence Steefel, George M. Stephenson; Professorial Lecturer Samuel B. Harding.

Prerequisites.—Of the four fields in which general survey courses in history are usually given, namely, ancient, American, English, and European, students entering upon graduate work in history will usually be expected to have covered two or three courses, with credit not exceeding 18 hours. For the other 9 hours, they should have a more advanced course in one of these fields and a second course in some field of history in which intensive work is done with the beginnings of investigation. In meeting these requirements consideration will be given to work done from the historical point of view in others of the social sciences, especially political science. The department attaches considerable importance to adequate preparation in the foreign languages, which may be used by the student in the course of advanced and research work. An especially good equipment here will be taken into consideration in weighing the students' preparation for graduate work.

AMERICAN HISTORY

- 112s. History of American Immigration. Settlement and development of typical racial stocks in America. Contributions of European immigrants to American life. Attention to political history. Prerequisites: 20 credits in social science group or 15 credits in history. Four credits. TW VI; 111OL. Mr. Stephenson.
- 125f, 126w. American Diplomatic History. Prerequisites: 20 credits in history and political science or 15 credits in either history or political science. Six credits. MWF III; 221OL. Mr. Shippee.
- 141f. The West in American History to 1815. Prerequisites: 20 credits in social science group, including History 7-8. Three credits. TThS II; 218bOL. Mr. Buck.
- 142w. The West in American History, 1815-65. This course, while offered separately, follows, and is calculated to form a natural sequence to History 141. Prerequisites: 20 credits in social science including History 7-8. Three credits. TThS II; 218bOL. Mr. Shippee.
- 144-145.† History of Minnesota. The settlement and development—political, economic, and social—of a typical American commonwealth. Prerequisites: 15 credits in social science including History 7-8. Six credits. (Not offered in 1925-26.)
- 146f-147w.† Constitutional History of the United States. Prerequisites: 15 credits in history or 10 credits in history and 10 in social science including 5 credits in political science. Six credits. MWF IV; 111OL. Mr. Shippee.

- 148f-149w. English Colonies in America. A brief consideration of the period of discovery and the founding of the English colonies, followed by a more detailed examination of the political and social institutions to 1689. The second quarter will be devoted primarily to imperial organization and the causes of the Revolution. Prerequisites: 20 credits in the social science group including 10 in history or 15 in history. Six credits. MWF I; 112OL. Mr. Harding.
- 152w. Select Topics, West to 1815. Prerequisites: 20 credits in history including 7-8. Five credits. TTh VIII, IX; 328Lib. Mr. Buck.
- 153s. The West in American Politics since 1865. An intensive study of independent parties and radical or progressive political movements. Prerequisites: 20 credits in history including History 7-8. Five credits. TTh VIII, IX; 328Lib. Mr. Buck.
154. Selected Topics in the History of Minnesota. Students taking this course are expected to do a portion of their work in the library of the Minnesota Historical Society. Prerequisites: 20 credits in history including History 7-8. Five credits. (Not offered in 1925-26.) Mr. Buck.
- 155f. United States, 1850-1865. Prerequisites: 20 credits in history including History 7-8. Five credits. WF VIII, IX; 326Lib. Mr. Shippee.
156. The Reconstruction Period. Prerequisites: 20 credits in history, including History 7-8. Five credits. (Not offered in 1925-26.) Mr. Shippee.
- 166f. Selected Topics in the History of Immigration. Prerequisites: 20 credits in history and consent of instructor. Five credits. TTh VIII, IX; ar. Mr. Stephenson.
- 208f-209w-210s. Seminar in American History. Required of graduate students whose major field is American history. The first term will be principally occupied with bibliographical and technical topics. Selected fields in American history will be studied in the other terms. Nine credits. Ar. Mr. Buck, Mr. Shippee, Mr. Stephenson.
- See also History 113-114-115† under Economic History; History 121 under English History, and History 111 under European History.

ANCIENT HISTORY

- 133f. The Near East, Old Orient. Origin of Egyptians, Babylonians, Assyrians, and Persians, and main features of their political history and civilization. History of the Hebrews discussed so far as it bears upon general oriental problems. Prerequisites: 20 credits in social science group. Five credits. (Not offered in 1925-26.)
- 103f. Political History of Greece. With special reference to the reaction upon cultural progress. Prerequisites: 20 credits in history or a major in Greek or Latin. Five credits. MTThFS III; 104OL. Mr. Cram.
- 105w. History of Rome. Prerequisites: 20 credits in social science group. Five credits. MTThFS III; 104OL. Mr. Cram.

- 134w. Ancient Civilization, Greece. Social and intellectual life of Greece. Prerequisites: 20 credits in history, or a major in Greek or Latin. Three credits. (Not offered in 1925-26.)
- 135s. Ancient Civilization, Rome. Social and intellectual life of Rome. The course will begin with a survey of political history. Prerequisites: 20 credits in history, or a major in Greek or Latin. Three credits. (Not offered in 1925-26.)

ECONOMIC HISTORY

- 113-114-115. Economic History of Europe since 1750. Prerequisites: 20 credits in history or economics, or both. Nine credits. (Not offered in 1925-26.) Mr. Gras.
- 116f-117w-118s. Economic History of Europe, 1300-1750. Prerequisites: 20 credits in history or economics, or history and economics combined. Nine credits. TThS II; 111OL. Mr. Gras.
- 169s. Economic History of the United States since the Civil War. Prerequisites: 20 credits in history or economics, or history and economics combined. Three credits. (Not offered in 1925-26.) Mr. Gras.
- 205-206-207. Seminar in Economic History. Nine credits. Ar. Mr. Gras.

ENGLISH HISTORY

- 109s. English History, 1815-1920. Prerequisites: 20 credits in social science group or 15 in history. Five credits. MTWFS IV; 111OL. Mr. Harding.
- 121w. English Backgrounds and the American Colonies. Prerequisites: 20 credits in history or political science. Five credits. MWThFS II; 112OL. Mr. White.
- 162f. The Beginnings of Parliament. From the Norman Conquest to the reign of Edward I, based wholly on original sources. Prerequisites: 20 credits in history including History 4-5; knowledge of at least high school Latin. Five credits. TTh VIII-IX; 328Lib. Mr. White.
- 183s. Stuart Period. Prerequisites: 20 credits in history including 4-5. Five credits. MW VIII, IX; 328Lib. Mr. Willson.

See also courses in Economic History.

EUROPEAN HISTORY

- 101f-102w.† The French Revolution and Napoleonic Era. Prerequisites: 20 credits in social science including 10 credits in history or 15 credits in history. Reading knowledge of French desirable. Six credits. TThS I; 112OL. Mr. Harding.
- 104s. The Near East, Modern. The Saracen Empire, Turkey, the Balkan States, and European diplomacy in the East since the beginning of the Middle Ages. Prerequisites: 20 credits in social science group or 15 credits in history. Five credits. MTThFS III; 104OL. Mr. Steefel.
- 106f-107w-108s. Europe, 1815-1914. Prerequisites: 20 credits in social science including 1-2 or 2-3. A reading knowledge of French and German will be helpful. Nine credits. MWF VII; 111OL. Mr. Steefel.

- 111w. European Background of American Immigration. Prerequisites: 20 credits in social science group or 15 credits in history. Four credits. MTWF VI; 111OL. Mr. Stephenson.
- 119s. The Renaissance and Reformation. Especial emphasis upon the work of individual men and upon ideas rather than upon politics and institutions. Prerequisites: 15 credits in history. Five credits. MTWFS IV; 112OL. Mr. Krey.
- 120f. Medieval Civilization. A study of the social and intellectual development of Europe from the period of the German migration to the end of the thirteenth century. Prerequisites: 15 credits in history. Five credits. MTWFS IV; 112OL. Mr. Krey.
- 127w. Feudal Institutions. Prerequisites: 15 credits in history. (Not offered in 1925-26.)
- 128w. Rise of Nationalism in Europe. A study of the growth of central government and the influences which led to the formation of nations to 1600. Chief attention to France. Prerequisites: 15 credits in history. Five credits. MTWFS IV; 112OL. Mr. Krey.
- 129f-130w.† The Formation and Fall of the Modern Roman Empire. Prerequisites: 20 credits in social science, including 10 credits in history. Six credits. (Not offered in 1925-26.) Mr. Ford.
- 157w-158s. Selected Topics in Nineteenth-Century History. Discussion based on a wide range of reading. Prerequisites: 20 credits in social science including History 101-102, 107-108, or 129-130. A reading knowledge of French or German will be required. Ten credits. TTh VII, VIII; 339Lib. Mr. Ford.
- 164w. Studies in the Crusades. Prerequisites: 20 credits in history; knowledge of at least high school Latin. Five credits. TTh VIII, IX; ar. Mr. Krey.
- 201f-202w-203s. Historical Bibliography and Criticism. Required of candidates for advanced degrees in history who do not present evidence of similar training elsewhere. S I; 328Lib. Mr. Ford, Mr. White, and others.
- 204f-205w-206s. Seminar in Medieval History. Nine credits. Ar. Mr. Gras, Mr. Krey, Mr. White.

HOME ECONOMICS

Professor Wylle B. McNeal; Associate Professors Alice Biester, Marion Weller; Assistant Professors Clara M. Brown, Alice Child, Jane Leichsenring, Ethel Phelps, Lucy A. Studley, Amy P. Morse; Instructors Jessie McMahon, Agnes Kolshorn.

Prerequisites.—For major work, credits in general inorganic chemistry, qualitative and quantitative analysis, organic chemistry, botany, bacteriology, and human physiology satisfactory to the instructor with whom the student wishes to work. In addition each student must have had elementary courses in that field of home economics in which she wishes to specialize, such as foods, nutrition, or textiles. The undergraduate subject-matter

courses must be satisfactory to the adviser under whose direction the major work is done.

For a minor, the prerequisites to the courses to be pursued must be met. The minor sequence should be arranged with a graduate adviser of the field in which the student proposes to work.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 103f,w,s. 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. Prerequisites: H.E. 22, 23. Three credits. MW VI, VII; F VI; 203-207HE. Miss Biester, Miss Leichsenring.
- 104f,w,s. Field Work in Nutrition. Laboratory, case, and group work in problems of feeding. Prerequisites: H.E. 103 or parallel. Two credits. Lect. F VII. Lab. ar. Miss Biester, Miss Leichsenring.
- 105f,w,s. Experimental Cookery. An intensive study of problems in foods and food preparation with individual laboratory problems. Prerequisites: H.E. 22, 23. Three credits. Fall, MWF I, II; winter and spring, TThS I, II; 107HE. Miss Child.
- 106f,w,s. Experimental Cookery. Same as 105 except that additional work will be required. Five credits. Fall, MWF I, II; winter and spring, TThS I, II; 107HE. Miss Child.
- 108f,w. Nutrition II. A study of metabolism including work on tissues, blood, and urine. Prerequisites: H.E. 23. Five credits. Fall, MTWThF I, II; 211, 213HE.; winter, Sec. 1, MTWFS III, IV; Sec. 2, MTWThF I, II; 211, 213HE. Miss Leichsenring, Miss McMahan.
- 109w. Advanced Nutrition. A study of selected quantitative methods applicable to investigations relating to digestion and metabolism. Prerequisites: Agr. Biochem. 2; H.E. 23. Five credits. Lect. ar. Lab. TThS I, II, III; 311HE. Miss McMahan.
- 110s. Special Problems in Dietetics. An intensive study involving assigned readings, discussions, and field work. Prerequisites: H.E. 103. Three credits. Lect. MW VIII; 213HE. Lab., one full afternoon; ar. (Not offered in 1925-26.) Miss Biester, Miss Leichsenring.
- 111f. Special Food Problems. A continuation of experimental cookery involving more advanced problems. Prerequisites: H.E. 105, Agr. Biochem. 2. Three credits. TTh VI, VII, VIII; 107HE. Miss Child.
- 112s. Special Food Problems. Same as 111f. Prerequisites: H.E. 105, Agr. Biochem. 2. Five credits. MTWThF VI, VII; 107HE. Miss Child.
- 122f,s. Advanced Textiles. An intensive study of problems relating to the manufacture and use of textile materials; laboratory studies of fibers, shrinkage and other laundry applications, and physical testing of fabrics. Prerequisites: Textiles .5 cred., Organ. Chemistry 5 or 6

- cred., Principles of Economics 5 cred., or parallel. Three credits. Fall, MWF I, II; spring, MWF VI, VII; 311HE. Miss Phelps.
- 123f,w. Clothing Economics. Consideration of problems in the textile and clothing industries and in marketing of clothing that are of consumer interest; conditions of work and wages; standardization of fabrics and clothing; setting of styles; the clothing budget; textile legislation; hygiene of clothing. Prerequisites: Dressmaking 5 cred., Economics 5 cred. Two credits. TS III; 313HE. Miss Weller.
- 126w. Textile Analysis. Problems and applications of quantitative analysis with special reference to establishing standards for fabrics. Prerequisites: Quant. Chem. 5 cred., Adv. Textiles 3 cred. Three credits. MWF VI, VII, VIII; 311H.E. Miss Phelps.
- 131f,w,s. Home Management: House Planning and Equipment. House plans and kitchen arrangements studied from viewpoint of the homemaker. Study of principles underlying selection and arrangement of house furnishing and equipment, including such subjects as walls, rugs, furniture, hangings, and accessories. Special problems for graduate students. Prerequisites: H.E. 52, 53. Five credits. Fall, MTWFS III, IV; winter, Sec. 1, MTWFS III, IV; Sec. 2, MTWThF VI, VII; spring, MTWThF I, II; 401HE. Miss Morse.
- 136s. Budget Problems. An intensive study of problems relating to individual and family budgets involving readings, discussions, and field work. Prerequisites: H.E. 34, 35, 103, 123, Agr. Econ. 126 parallel. Three credits. Lect. MW VII; 213HE. Lab. one-half day to be arranged. Miss Studley.
- 145w,s. Home Economics Survey. A discussion of the historical development of home economics with emphasis upon current practices and problems. Two credits. TS IV; 203HE. Miss McNeal.
- 151s. Institution Management Problems. Lectures and discussions of the problems involved in institution management; organization; service; institution-planning, decoration, and equipment; budgets; and the study of different types of institutions. Prerequisites: H.E. 61, 63. Four credits. TS IV; M III, IV; 106HE. Miss McFarland.
- 180s. Nutrition in Disease. A study of the fundamental principles involved in using diet in the treatment of certain diseases. Prerequisites: H.E. 103, 108. Three credits. Lect. MW VIII; Lab. ar.; 213HE. Miss Biester, Miss Leichsenring.
- 181f. Digestion and Metabolism. An intensive study of problems relating to digestion and metabolism involving lectures, readings, and demonstration. Prerequisites: H.E. 23, 108; Physiol. 4. Three credits. MW VII, VIII, IX; 213HE. Miss Leichsenring.
- 203f,w,204s. Home Economics Problems. Opportunity is offered for the investigation of selected problems in home economics in fields such as foods, nutrition, textiles. Three or five credits. Hours and days arranged. Miss McNeal, Miss Biester, Miss Child, Miss Leichsenring, Miss Phelps.

- 205f,w,s. Home Economics Seminar. A critical study of recent advances in home economics in fields such as foods, nutrition and textiles, involving outside reading and oral or written reports. Required of all majoring in home economics or minoring in home economics for the Ph.D. degree. One credit. Hours and days arranged. Miss McNeal, Miss Biester, Miss Child, Miss Phelps, Miss Leichsenring.
222. Animal Fibers. An advanced course dealing with the structure, composition, chemical and physical properties, and special problems of manufacture of wool and silk in relation to their use. Prerequisites: Quant. Chem. 5 cred., Organic Chem. 5 or 6 cred., Adv. Textiles 3 cred., Two credits. Hours and days arranged. Miss Phelps.
223. Plant and Manufactured Fibers. Study of the structure, composition, physical and chemical properties, and special problems of manufacture of cotton, flax, artificial silk and certain minor fibers in relation to their use. Prerequisites: Botany 5 cred., Quant. Chem. 5 cred., Organic Chem. 5 or 6 cred., Adv. Textiles 3 cred. Two credits. Hours and days arranged. Miss Phelps.
224. Micro-Analysis of Textile Fibers. Laboratory applications of histological and micro-chemical methods in the study of textile materials. Prerequisites: Botany 5 cred., Biological sciences 10 cred., Organic Chem. 5 or 6 cred., Textile Analysis 3 cred. Two or three credits. Hours and days arranged. Miss Phelps.
280. Principles of Human Nutrition. An intensive study of such factors as the energy, protein, mineral, and vitamin requirement in human nutrition. Hours and days arranged. Miss Biester, Miss Leichsenring.

HORTICULTURE

Professor William H. Alderman; Associate Professor Wilfrid G. Brierley; Assistant Professor Fred A. Krantz.

Prerequisites.—For major work, 15 credits; for minor work, 9 quarter credits in the department in addition to two years in botany and one year in entomology.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 107f. Orchard Management. A detailed study of the various operations in orchards and berry fields. Operating costs and profits. Lectures, laboratory, and individual problems. Prerequisite: Horticulture 6, Botany 9 credits. Three credits. TS IV; W VI, VII; 210Hr. Mr. Brierley.
- 109f,w. Principles of Genetics. Given in co-operation with Division of Agronomy and Farm Management. Designed to familiarize students with underlying principles of breeding. Prerequisites: Botany 9 credits, or Animal Biology 9 credits. Three credits. ThS I; T III; 212Hr. Mr. Beaumont.
- 110w. Horticultural Crop-Breeding. Applied genetics is emphasized. Methods of breeding each of the important horticultural crops with special attention to experiment station investigations and to the methods

- used by plant breeders. Prerequisite: Horticulture 109 or Agronomy 131. Three credits. TThS III; 215Hr. Mr. Wilcox.
- 111f. Systematic Pomology. A study of fruit varieties. Lectures, laboratory, and a survey of the literature. Prerequisites: Horticulture 6, Botany 9 credits. TTh II; Th VI, VII; 8Hr. Mr. Brierley.
- 131f,132w. Advanced Vegetable Production. Reviews and reports on literature, special problems. Prerequisite: Horticulture 32. Three credits per quarter. Mr. Krantz.
- 135w. Potato Production. A study of the origin, botany, regional distribution, economic importance, group classification, standardization of varieties according to soil, climate, and markets. Identification, exhibiting, judging, cultural methods, seed selection, and certification, marketing and utilization. Prerequisite: Horticulture 6 or 32, botany nine credits. Three credits. 102Hr. Mr. Krantz.
- 190f-191w-192s. Special Problems. A study of problems based upon the work given in the preceding courses. Two to four credits per quarter. Mr. Alderman, Mr. Brierley, Mr. Beaumont, Mr. Cary, and Mr. Krantz.
- 193f-194w-195s. Horticultural Seminar. Reports and discussions of problems and investigational work. Required of graduate students. One credit per quarter. Horticultural staff.
- 242w. Methods and Interpretation of Horticultural Research. A critical analysis of the more important horticultural investigations, together with a study of methods and organization of research work in horticulture. Two credits. Mr. Alderman.
- 243f-244w. Advanced Topics in Horticulture. A critical analysis of recent research on horticultural crops. Three credits per quarter. Mr. Alderman, Mr. Beaumont, Mr. Krantz.

LATIN

Professor Joseph B. Pike; Assistant Professor Robert V. Cram.

Prerequisites.—Any four of Courses 21-73, and 6 credits in addition selected from standard courses. A reading knowledge of French, German, or Greek is required of candidates for the Master's degree.

The degree of master of arts: For a major in Latin, Course 221-222-223 or 211-212-213 and in addition one course each quarter selected from Courses 121-133. The student will be expected to choose for his thesis some problem connected with one of these courses. Besides, a minor is to be carried throughout the year in one of the following departments: Comparative Philology, English, German, Greek, History, Romance Languages, or Scandinavian. For a minor in Latin, Course 211-212-213 or one course each quarter selected from Courses 121-133.

Candidates for the degree of doctor of philosophy in Latin will be expected to spend at least three years in preparation and will carry each quarter in addition to one seminar course and one of the courses listed below, one course in advanced Greek (i.e., in advance of two years of preparatory Greek). A knowledge of Greek and Roman history, Greek

and Roman literature, and a special knowledge of a particular Latin author, or group of authors, will be required. In addition to the particular author or authors assigned the candidate will be expected to have read in the original the following list of Latin authors:

Caesar: A considerable portion of the Gallic War and the Civil War.

Catullus: All except LXIII-LXVIII.

Cicero: Fourteen orations (*e.g.*, Roscius Amerinus, Verres Actio Prima, Imperium Pompeii, Catilinarians I-IV, Murena, Archias, Milo, Marcellus, Ligarius, Deiotarus, Philippics II; Cato Maior, Laelius, Tusculan Disputations, Book I.)

Horace: All.

Juvenal: Satires I, III, IV, VII, VIII, X, XI.

Livy: Books I, II, XXI, XXII.

Lucretius: Books I-III, V.

Martial: At least one half.

Ovid: About four thousand verses of the *Metamorphoses*.

Plautus: *Amphitruo*, *Aulularia*, *Captivi*, *Menaechmi*, *Miles Gloriosus*, *Moscellaria*, *Rudens*, *Trinummus*.

Pliny the Younger: At least one half.

Quintilian: Book X, C. 1.

Suetonius: Iulius, Augustus, Tiberius, Nero, Domitian.

Tacitus: *Annals* I-VI or XI-XVI.

Terence: *Adelphoe*, *Andria*, *Hautontimorumenus*, *Phormio*.

Virgil: All except the minor poems.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

121. Advanced Virgil. Selection from the *Eclogues*, *Georgics* and from Books 7-12 of the *Aeneid*. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. MWF II; 109F. Mr. Pike.
- 122w. Cicero's Letters. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. MWF II; 101F. (Offered in 1926-27.) Mr. Pike.
- 123s. Medieval Latin. Selections from ecclesiastical writers, *Itinerarium Regis Ricardi* and selections from Mathew Paris. The course aims to accustom students to handle medieval Latin easily for historical or literary purposes. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. MWF II; 109F. (Offered in 1926-27.) Mr. Pike.
- 131f. Juvenal. Selection from Juvenal's work. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. Alternates with Course 121. MWF II; 107F. (Offered in 1926-27.) Mr. Pike.
132. Seneca's Epistles. Prerequisites: any two of Courses 51-73 or an equivalent. Three credits. Alternates with Course 122. MWF II; 107F. Mr. Pike.
133. Vulgar Latin. Lectures on vulgar Latin; selections from Petronius and Gregory of Tours. Prerequisites: any two of Courses 51-73 or an equivalent. Alternates with Course 123. Three credits. MWF II; 107F. Mr. Cram.

- 201f-202w-203s. Tacitus. (Graduate seminar, but open to students who register for honors in Latin.) Prerequisites: seven years of Latin or any two of Courses 51-73. Th VIII and IX. (Not offered in 1925-26.) Mr. Pike.
- 221-222-223. Graduate Seminar. Tusculan Disputations of Cicero. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII and IX; ar. Mr. Pike.
- 211-212-213. Graduate Seminar. Prerequisites: seven years of Latin or any two of Courses 51-73. Nine credits. T VIII IX; ar. (Offered in 1926-27.) Mr. Pike.

MATHEMATICS AND MECHANICS

Professors William E. Brooke, William H. Bussey, Hans H. Dalaker, William L. Hart, William F. Holman, Dunham Jackson, William H. Kirchner, Francis P. Leavenworth (Astronomy); Associate Professors Raymond W. Brink, Jacob O. Jones, Royal R. Shumway, Anthony L. Underhill; Assistant Professor Gladys Gibbens; Assistant Astronomer William O. Beal.

Professor Dalaker is chairman and Professor Underhill is secretary of the group. Students majoring in mathematics should consult one or the other.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102f-103w-104s.* Advanced Analytic and Synthetic Geometry. Three credits per quarter. Miss Gibbens.
- 106f. Differential Equations. Three credits. MWF III; 108F. Mr. Brink.
- 107w-108s. Advanced Calculus. Three credits per quarter. MWF III; 108F. Mr. Brink.
- 111f-112w-113s. Celestial Mechanics. Three credits per quarter. (This course is identical with Astronomy 111-112-113.) Mr. Beal.
- 115f-116w-117s.* Differential Geometry. Three credits per quarter. Mr. Underhill.
- 118f-119w-120s. Vector Analysis. Three credits per quarter. Mr. Jackson.
- 121f-122w-123s. Mathematical Theory of Statistics. Three credits per quarter. (Given in 1926-27.) Mr. Jackson.
- 127f,w,s. Technical Mechanics. Five credits. Mr. Wilcox.
- 128f,w,s. Strength of Materials. Five credits. Mr. Holman.
- 129f,w,s. Hydraulics. Four credits. Mr. Jones.
- 140w. Method of Least Squares. Three credits. (This course is identical with Astronomy 140.) Mr. Leavenworth.
- 150w. Advanced Mathematics for Electrical Engineers. Three credits. Mr. Herrmann.
- 151f-152w-153s. Differential Equations and Advanced Calculus Applied to Engineering Problems. Three credits per quarter. Mr. Dalaker, Mr. Hartig.

* One of the 2 courses 102-103-104, 115-116-117 will be given in 1925-26.

- 154f-155w-156s. Modern Higher Algebra. Three credits per quarter. (Given in 1925-26.) Mr. Dalaker.
- 161f-162w-163s. Advanced Technical Mechanics. Three credits per quarter. Mr. Wilcox.
- 171f-172w-173s. Aerodynamics. Three credits per quarter. Mr. Boehnlein.
- 180s. Advanced Strength of Materials. Three credits. Mr. Priester.
- 184f-185w-186s. Advanced Testing Materials Laboratory. Two to six credits. Mr. Priester.
- 191f-192w-193s. Hydraulic Motors and Pumps. Three credits per quarter. Mr. Jones.
- 194f,w,s-195f,w,s-196f,w,s. Special Problems in Hydraulics. Three credits per quarter. Mr. Jones.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 206f-207w-208s. Theory of Functions of Real and Complex Variables. Three credits per quarter. (Given in 1925-26.) Mr. Hart.
- 221f-222w-223s. Calculus of Variations. Three credits per quarter. (Not given in 1925-26.) Mr. Underhill.
- 264f-265w-266s. Dynamics of a Rigid Body. Three credits per quarter. Routh, Vol. I. (Given in 1926-27.) Mr. Brooke.
- 274f-275w-276s. Dynamics of a Particle. Three credits per quarter. (Given in 1925-26.) Mr. Brooke.
- 281f-282w-283s. Advanced Theory of Functions. Three credits per quarter. (Not given in 1925-26.) Mr. Jackson.
- 291f-292w-293s. Hydrodynamics. Three credits per quarter. (Given in 1926-27.) Mr. Brooke.
- 294f-295w-296s. Theory of Elasticity. Three credits per quarter. (Given in 1925-26.) Mr. Brooke.

The following courses have been offered from time to time in the past, and similar courses, or other courses of corresponding grade, will be provided at any time when there is sufficient demand for them.

Projective Geometry.

The Mathematics of Small Vibrations.

The Theory of Numbers.

The Calois Theory of Equations.

Higher Plane Curves.

Advanced Differential Equations.

Exterior Ballistics.

The Calculus of Finite Differences.

Modern Theories of Integration.

Theory of Linear Differential and Integral Equations.

Theory of Functions of a Complex Variable. Three credits per quarter throughout the year.

Advanced Descriptive Geometry.

Perspective.

Modern Analysis. (Based on Whittaker and Watson's Text.)

Fourier's Series and Spherical Harmonics.
 Advanced Dynamics. Vol. II. Routh's *Dynamics*.
 Advanced Analytic Geometry of Space.
 Elliptic Functions and Integrals with Applications.
 Advanced Statics.

MECHANICAL ENGINEERING

Professors John J. Flather, Frank B. Rowley, S. Carl Shipley, Charles F. Shoop; Associate Professor John V. Martenis.

INDUSTRIAL ENGINEERING

- 120w. Industrial Plants. Factory organization and construction for economical manufacture. Organization of the industry. Location and type of buildings, power development. Layout of plant. Routing systems and machine layout. Heating and ventilating requirements. Distribution of power; internal transportation. Lectures, recitations, and drawing room practice. Three credits. Open to seniors with 15 or 16. Mr. Flather.
- 121s. Production Methods. Principles and practice involved in economical production. Standardization. Requirements for uniformity and interchangeability. Jigs, fixtures, and special equipment; gages and inspection systems. Division of labor. Lighting, heating, and sanitation. Conveying, handling, and stores control. Fatigue elimination. Three credits. Open to seniors with 15 or 16. Mr. Shipley.
- 223f. Industrial Management. General principles. The Taylor system; wage, bonus, and profit-sharing systems. Maintenance and depreciation. Purchasing. Allocation of cost, overhead, and machine burden. Graphical representation. Prerequisite: 121. Mr. Flather.
- 224w. Industrial Management Laboratory. Planning department. Time and motion studies; rate-setting. Instruction cards. Production control. Shop practice with investigation in local factories. Lectures, assigned reading, practice, and reports. Three credits. Prerequisite: 223f. Mr. Shipley.
- 225s. Industrial Management. Labor administration. Foreman-training. Training the worker; job analysis. Employment and turnover; the human element, service departments. Stabilization of labor. Lectures, reading, shop visits, and reports. Three credits. Prerequisite: 224. Mr. Flather.
- 226f. Safety Engineering. Safety of the worker; fire and other hazards; prevention of industrial accidents. Compensation laws. Fire prevention: construction; automatic sprinkler systems. Effect of safety on production. Factory sanitation. Safety organization. Lectures, assigned reading, factory inspections, and reports. Prerequisite: 121. Three credits. Mr. Shipley.

- 227w-228s. Industrial Engineering Problems. Special investigations of practical problems and suggested methods of procedure. Lectures, assigned reading, shop visits and reports. Three credits. Prerequisite: 223, 224, 225 or registered in 223, 224, 225. Graduates only. Mr. Flather, Mr. Shipley.

MACHINE DESIGN

- 131f-132w-133s. Advanced Engineering Design. Original design, including machinery for changing size and form, cranes, pumping, transmission machinery, and engineering appliances. Lectures, problems, and drawing room practice. Three credits per quarter. Prerequisite: 35. Mr. Flather, Mr. Flodin.

STEAM ENGINEERING

- 135f. Steam Engine Design. Calculations and working drawings for a high speed automatic or Corliss steam engine. Theoretical diagrams, inertia forces; determination of details. Senior option. Three credits. Prerequisite: 42 or equivalent. Mr. Flather, Mr. Campbell.
- 144f. Heat Engines. Elementary thermodynamics. Properties of steam; types and details of steam engines; valve gears; governors; compound engines. Condensers and air pumps. Courses 144, 145, 146 are arranged for students in electrical engineering, and are accompanied by three hours' work in laboratory each week. Three credits. Prerequisite: M.&M. 26. Mr. Shoop, Mr. Rowley, Mr. Robertson.
- 145w. Heat Engines. Continuation of Course 144. Combustion and fuels; boilers, smoke prevention. Selection of engines and boilers. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in the laboratory each week. Three credits. Prerequisite: 144. Mr. Shoop, Mr. Rowley, Mr. Robertson.
- 146s. Heat Engines. Elementary study of steam turbines and gas engines. Courses 144, 145, 146 are arranged for students in electrical engineering and are accompanied by three hours' work in laboratory each week. Three credits. Prerequisite: 145. Mr. Shoop, Mr. Rowley, Mr. Robertson.
- 147w. Heat Engines. Elementary thermodynamics. Properties of steam; calorimeters; pyrometry; types and details of steam engines; valve gears; governors; compound engines. Condensers and pumps. Combustion and fuels; evaporation; steam boilers, smoke prevention. Includes four hours' work in laboratory per week. Four credits. Prerequisite: M.&M. 26. Mr. Shoop, Mr. Tuve.
- 148s. Heat Engines. Elementary study of steam turbines and gas engines; gas producers. Refrigeration. Air compressors. Includes four hours' work in laboratory per week. Three credits. Prerequisite: 147. Mr. Shoop.

- 149f,w,s. Heat Engines. A brief course for students in civil engineering and the course in architectural engineering includes four hours' laboratory per week. Four credits. Prerequisite: M.&M. 26. Mr. Tuve.
- 151s. Thermodynamics. The mechanical theory of heat as applied to steam, oil, gas, and hot air engines and allied power plant machinery and accessory equipment, including compressors, injectors, reheaters, and refrigerating apparatus. Three credits. Prerequisites: M.&M. 127, 128, 129. Mr. Shoop, Mr. Tuve.
- 152w. Steam Turbines. Theory and practice applied to various types. Thermodynamics and mechanical analysis of problems involved in the design of nozzles, blades, rotors, bearings, and governors. Condition of operation; systems of transmission; lubrication; economy; field of service. Laboratory investigation. For seniors. Three credits. Prerequisite: 151. Mr. Shoop.
- 165s. Fuels and Combustion. Fuels: classification and analyses. Hand and stoker treatment; regulation. Pulverized and liquid fuels. Types of burners, controls. Combustion: Generation of heat; furnace gases; stratification; flame way; smoke prevention. Furnaces. Lectures and recitations. Three credits. Prerequisite: M.E. 43. Mr. Shoop.
- 181w. Advanced General Laboratory. Indicator practice, valve-setting, separating and throttling calorimeters, tests of steam engines, gas engines, pumps, air compressors, blowers, turbines, boilers, and power plant. Four actual hours. Prerequisite: 84. Mr. Rowley, Mr. Shoop, Mr. Robertson, Mr. Tuve.
- 182f,w. Advanced Steam Laboratory. Tests of steam turbines, flow of steam through nozzles and pipes. Tests of compound and triple expansion engines, condensers, superheaters, and boilers. Two credits. Prerequisite: 151. Mr. Shoop, Mr. Tuve.
- 251f. Advanced Thermodynamics. Expansion of Course 151. Theories of heat as applied to combustion and kinetic engines. Reversible changes of state of wet and superheated vapors. Non-reversible flow and efflux of wet and superheated vapors, throttling through orifices, valves, flow into receivers, communicating vessels. Critical points, liquefaction and mixtures of gases. Gas cycles. Treatment of imperfect gases. Three credits. Prerequisite: 151. Mr. Shoop.

HEATING, VENTILATION, AND REFRIGERATION

- 153f. Heating and Ventilating. Principles of heating and ventilation. Construction and operation of heating apparatus. Furnaces, steam, hot water, vapor, vacuum, and fan systems of heating; ventilation. Lectures, recitations, and designs. For seniors.—Required of senior architectural engineers. Four credits. Prerequisites: M.&M. 127, 128, 129. Mr. Rowley.
- 154s. Heating and Ventilating. Same as Course 153 with the omission of design problems. Arranged for students in the course in Architecture. Two credits. Prerequisite: M.&M. 92. Mr. Rowley.

- 156s. Compressed Air and Refrigerator Machinery. (a) Air compressors and motors; power transmission by compressed air. (b) Principles of refrigeration. Various types of refrigerating machines, refrigerants, applications to ice-making, cold storage, cooling of air, liquids, and solids. Lectures and recitations. Three credits. Prerequisite: 151. Mr. Shoop.
- 255f,w,s. Advanced Heating and Ventilating. An advanced course for graduates. To be taken in connection with research work in the laboratory, Course 287. Three credits. Prerequisite: 153. Mr. Rowley.
- 257w. Mechanical Equipment of Buildings. Appliances used; heating, ventilating, plumbing systems; piping for fire protection, compressed air, gas, and vacuum cleaning; elevators. Choice of systems. Theory and practice of designing and detailing layouts. Equipment designs for various types of buildings. Three credits. Prerequisite: Phys. 43. Mr. Rowley, Mr. Martenis.

AUTOMOTIVE AND AERONAUTICAL ENGINEERING

- 136f,w. Gas Engine Design. Calculations and working drawings of a gas motor for heavy duty tractor, truck, marine, or other service. Theoretical diagrams and details of parts. Senior option. Three credits. Prerequisite: registration in 150. Mr. Robertson, Mr. Hazen.
- 137w. Advanced Gas Engine Design. Continuation of Course 136. Three credits. Prerequisite: 136. Mr. Robertson, Mr. Hazen.
- 141w. Automobile and Motor Truck Engines. Continuation of 150 with special reference to automobile and motor truck engines. Theoretical consideration of engine parts and accessories, carburetion of various fuels; the Diesel principle as applied to small high speed engines. Lectures, recitations, and problems. Three credits. Prerequisite: 150. Mr. Robertson, Mr. Hazen.
- 142s. Automobile and Motor Trucks. Theory and design of the automobile and motor truck chassis, including frames, brackets, clutches, transmission, axles, steering gears, and springs. Lectures, recitations, and problems. Three credits. Prerequisite: 141. Mr. Hazen.
- 150f. Gas Engines and Producers. Laws of gases; gas cycles. Otto, semi-Diesel, and Diesel engines. Mechanism of various types. Carburetion, governing, cooling, lubrication. Principles of design. Gas producers; types, suction, pressure, blast furnace. By-products recovery. Three credits. Prerequisites: 41, 43. Mr. Robertson.
- 183f,w. Power and Gas Engine Laboratory. Tests of gas and gasoline engines and gas producers. Power and lighting plants. Two credits. Prerequisite: registration in 150. Mr. Robertson, Mr. Shoop.
- 231f,232w,233s. Automobile and Motor Truck Design. A course covering the theory and design of the automobile and motor truck engine and chassis in which the design of the complete engine, transmission, and chassis is carried out. Three credits each quarter. Lectures and drawing room work. Graduates only. Mr. Hazen.

- 237s. Gas Tractor Design. Selection of wheel sizes; horsepower weight and drawbar pull. Bearing pressures; ratios and strength of gearing. Details of principal parts. Senior option. Three credits. Prerequisite: 136. Mr. Robertson, Mr. Hazen.
- 293f,w,s. Aeronautical Engineering. Design of aerial propellers, aeroplane engines. Application of theory of propellers and gasoline engines to aeroplanes. Includes calculations and drawings for high-speed, multi-cylinder, light-weight engine; balancing reciprocating parts; uniform torque; theoretical diagrams. Three credits. Prerequisite: 150. Mr. Hazen.
- 294f,w,s. Aeroplane Design. Calculations and drawings for a given aeroplane; stability, strength, propulsion, and motive power required. Three credits. Prerequisite: 136.
- 281f,282w,283s. Automobile-Testing and Research. Dynamometer and road tests including overall efficiency of cars and motor trucks, transmission efficiencies, performance of cars at various speeds, fuel consumption, effect of road surface on traction, efficiencies, and general performances. Special research problems. Three credits each quarter. Graduates only. Mr. Robertson.
- 295s. Motor Truck Transportation. Problems involving motor truck transportation, capacity of trucks, trailers, drawbar pull. Efficiencies. Effect of road surface. Freight-handling. Analysis of costs of truck operation and maintenance. Relative costs of transportation. Three credits. Prerequisite: 142.

POWER PLANT ENGINEERING

- 162f. Power Plant Machinery. Advanced study and application of engines, stokers, boilers; coal-handling equipment and accessories. Lectures, recitations. Three credits. Prerequisite: M.E. 43. Mr. Shoop.
- 163w. Power Engineering. Principles of thermodynamics applied to power plant equipment. Three credits. Prerequisite: M.E. 162. Mr. Shoop.
- 164w. Elements of Power Plant Design. Problems in design of power plant elements such as condensers, air pumps, boilers, turbines, piping, and separators. Three credits. Prerequisite: M.E. 163. Mr. Flodin.
- 166s. Water Turbines. The theory of operation, design, construction, and regulation of water turbines. Turbine-testing; characteristics, selection of type. Cost of turbines and water power. Senior option. Three credits. Prerequisite: M.&M. 129.
- 265f-266w. Power Plant Design. Problems, designs, and estimates for power plants and central stations. Selection of motive powers, relative advantages of steam and producer gas plants, choice of engines and boilers; pumps, shafting, piping, and accessories. Three credits per quarter. Prerequisite: M.E. 164. Mr. Shoop.
- 267s. Power Plant Management. Operation and maintenance of boilers, engines, gas producers, gas engines, steam turbines, and accessory apparatus. Smoke prevention. Flue gas analysis. Power plant finance. Daily logs and power cost. Three credits. Prerequisite: M.E. 164. Mr. Shoop.

RAILWAY MECHANICAL ENGINEERING

- 271f. Railway Technology. The practical details of construction of locomotives. A systematic course of visits to the various railroad shops in the vicinity. Lectures and recitations. One credit. Prerequisites: M.&M. 127, 128, 129. Mr. Martenis.
- 272f-273w-274s. Railway Design and Locomotive Construction. Locomotive and car details; the locomotive boiler, linkages, and assembled parts. Construction of locomotives: frames, springs, equalizing arrangements, running gear, brakes, trucks, lubrication. Engine details; heat insulation, cylinder proportions. Lectures and assigned reading. Four credits per quarter. Prerequisite: 271, or registration in 271. Mr. Martenis.
- 278s. Locomotive Road Tests. Tests on locomotives and trains. Dynamometer car and drawbar pull. Three credits. Prerequisite: 271, 272. Mr. Flather and assistants.

GENERAL COURSES AND RESEARCH

- 190f-191w-192s. Seminar. Same as Course 93. Arranged for seniors. One credit per quarter. Mr. Flather, Mr. Rowley, Mr. Martenis, Mr. Shipley.
- 290f-291w-292s. Seminar. Same as Course 93. Arranged for graduate students. One credit per quarter. Mr. Flather.
- 184s. Advanced Engineering Laboratory. Opportunity will be offered for carrying on investigations in connection with tests of power plants, refrigerators, air compressors, blowers, and fans. Also automobile-testing and gas engine investigations. Two credits. Prerequisites: 182, 183. Mr. Rowley, Mr. Shoop, Mr. Robertson.
- 287f-288w-289s. Mechanical Engineering Research. Courses may be elected which involve investigations in connection with fuels, lubricating oils, steam and gas engines, heating and ventilating, and other problems as selected. Reports, special problems, and related tests. Three credits per quarter. Prerequisite: 181 or registration in 181. Mr. Flather, Mr. Rowley, Mr. Shoop, Mr. Robertson.

MEDICINE

(Including General Medicine, Dermatology, and Nervous and Mental Diseases)

The graduate work in the Department of Medicine is designed to prepare students for practice of the specialty of internal medicine, research in the problems of general medicine, and for the specialty of nervous and mental diseases, as the case may be, and to train men as teachers in their respective fields. Prospective students who have had no special work in addition to that of the undergraduate course in physiology, physiologic chemistry, therapeutics, experimental medicine, or pathology are advised to devote a year or more to these subjects before entering the regular

three-year graduate course. Throughout the course it is recommended that a minor be carried in one or more of the following departments: Physiology, Pharmacology, Pathology, Immunology, and Pediatrics. For students specializing in nervous and mental diseases, minors in anatomy and psychology are especially valuable, and for those desiring it, work would be arranged in the Department of Ophthalmology and Oto-Laryngology, giving a special opportunity to study lesions of the eye occurring in systematic disorders. In the Medical School, during at least the third year of the three-year fellowship, the fellow acts as an officer of the clinic with definite responsibility in the care of patients in the University Hospital.

For courses of study see special bulletin of graduate courses in medicine.

METALLOGRAPHY

Professor Oscar E. Harder; Instructor R. L. Dowdell.

Prerequisites.—For major work, adequate preparation in the sciences fundamental to metallography (chemistry, physics, geology, technical subjects), the general requirements being fulfilled. For minor work, the prerequisites to the courses to be pursued.

Exemption from the language requirements for the Master's degree may be made in individual cases.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 150f. Metallography for Electrical Engineers. Principles of metallography, including pyrometry, thermal analysis, constitution diagrams, microscopic and photomicrographic technique; study of typical alloys with special reference to electrical resistance, conductivity, magnets, etc. Laboratory work and demonstrations. Two lectures, three laboratory hours per week. Three credits. MW I; 315M. M VI, VII, VIII; 307M. Mr. Harder, Mr. Dowdell.
- 151w. Advanced Metallography for Electrical Engineers. Continuation of 150. Two lectures, three laboratory hours per week. Prerequisite: Course 150. Three credits. MW I; 315M. M VI-VIII; 307M. Mr. Harder, Mr. Dowdell.
- 153f-154w-155s. 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. Three lectures, four laboratory hours per week each quarter. Prerequisites: Chemistry 28, Physics 43. Five credits per quarter. MWF VI or VII; 305M. T VI-IX; 307M. Mr. Harder, Mr. Dowdell, Mr. Weber.
- 156f. Metallography for Mechanical Engineers. Similar to 150 but specially arranged for students in mechanical engineering. Two lectures, three laboratory hours per week. Three credits. ThS III; 112M. W or F VI-VIII; 307M. Mr. Harder, Mr. Dowdell, Mr. Weber.

- 157w. Advanced Metallography for Mechanical Engineers. Continuation of 156. Two lectures, three laboratory hours per week. Three credits. Prerequisite: Course 156. ThS III; 112M. W or F VI-VIII; 307M. Mr. Harder, Mr. Dowdell, Mr. Weber.
- 160f. Metallography for Chemical Students. Principles of metallography, including constitution diagrams, preparation and standardization of thermocouples, preparation and thermal analysis of alloys, microscopic examination and making of photomicrographs; typical alloys systems as iron-carbon (steel and cast iron), some non-ferrous alloys. Prerequisite: Chemistry 20. Two lectures and 3 laboratory hours per week. Three credits. MW II; 112M. Th VI-VIII; 307M. Mr. Harder, Mr. Dowdell, Mr. Weber.
- 161w. Advanced Metallography for Chemical Students. Metallography and heat treatment of iron and steel, including alloy steels, commercial uses of various steels, and engineering specifications. Prerequisite: Course 160. Two lectures and three laboratory hours per week. Three credits. MW II; 112M. Th VI-VIII; 307M. Mr. Harder, Mr. Dowdell, Mr. Weber.
- 162s. 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. Prerequisite: Course 160. Two lectures and three laboratory hours per week. Three credits. MW II; 112M. Th VI-VIII; 307M. Mr. Harder, Mr. Dowdell, Mr. Weber.
- 163f-164w-165s. Advanced Metallography. Technical and scientific research. The study of steel rails, automobile and locomotive parts, tool steels, etc. Special problems in metallography with outside reading. Seminar work in the recent advances in metallography. Prerequisites: Courses 151, 155, 157, or equivalent. Credits and hours to be arranged. 305M. Mr. Harder.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Advanced Metallography for Graduate Students. Intended primarily for research work. Credits and hours to be arranged. 305M. Mr. Harder.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

For staff and courses of study offered, see special bulletin of graduate work in medicine.

OBSTETRICS AND GYNECOLOGY

For staff and courses of study offered, see special bulletin of graduate work in medicine.

PATHOLOGY

Prerequisites.—Graduate students who desire to take their major or minor work in pathology must present credits in the following subjects: physics, 8 credits; general and organic chemistry, 12 credits; zoology, 6 credits; and a reading knowledge of German.

In addition, students who elect their major work in pathology must present credits for the equivalent of the first two years' work of the Medical School of this University.

For staff and courses of study offered, see special bulletin of graduate work in medicine.

PEDIATRICS

For staff and courses of study offered, see special bulletin of graduate work in medicine.

PHARMACOLOGY AND THERAPEUTICS

For staff and courses of study offered, see special bulletin of graduate work in medicine.

PHILOSOPHY

Professors Norman Wilde, David F. Swenson; Assistant Professor George P. Conger.

Prerequisites.—For a major, 18 credits; for a minor, 9 credits.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 100f. History of Religions. Prerequisite: 10 credits. Three credits. TThS II; 322F. Mr. Conger.
- 101w. Psychology of Religion. Prerequisite: 10 credits. Three credits. TThS II; 322F. Mr. Conger.
- 102s. Philosophy of Religion. Prerequisite: 10 credits. Three credits. TThS II; 322F. Mr. Swenson.
- 103s. Esthetics. Prerequisite: 10 credits. Three credits. MWF II; 322F. Mr. Swenson.
- 104s. History of Esthetic Theory. Prerequisite: 10 credits. Three credits. MWF II; 322F. (Alternates with 103. Not given in 1925-26.) Mr. Swenson.
- 120w. Scandinavian Philosophy. Prerequisite: 10 credits. Three credits. TTh 1:00-3:20; 316F. (Not given in 1925-26.) Mr. Swenson.
- 124f. Political and Social Ethics. Prerequisite: 20 credits in any social science, or 10 in philosophy. Five credits. T-S I; 322F. Mr. Wilde.
- 129w. Modern Political Thought. Prerequisite: 10 credits in philosophy, or 20 credits in any social science. Five credits. T-S I; 322F. Mr. Wilde.
- 135f-136w. The Philosophy of Plato. Prerequisite: 10 credits. Six credits; MWF VIII; 338NL. Mr. Swenson.

- 141f-142w. Metaphysics. Prerequisite: 10 credits, including Philosophy 2. Six credits. MWF II; 338NL. Mr. Swenson.
- 147f-148w. Advanced Logic. Prerequisite: 10 credits, including Philosophy 2. Six credits. MWF II; 338NL. (Alternates with 141-142. Not given in 1925-26.) Mr. Swenson.
- 151f-152w. Modern Idealism. Prerequisite: 15 credits. Six credits. MWF VIII; 338NL. (Alternates with 135-136. Not given in 1925-26.) Mr. Swenson.
- 161f-162w-163s. Seminar in Philosophy. Individual investigation, topics to be determined after consultation with the department. Prerequisite: 20 credits. Nine credits. Mr. Wilde, Mr. Swenson, Mr. Conger.

PHYSICS

Professors Henry A. Erikson, John T. Tate, Anthony Zeleny; Associate Professor Louallen F. Miller; Assistant Professors Joseph Valasek, John H. Van Vleck; Instructor J. William Buchta.

Prerequisites.—For major work, differential and integral calculus and two years of physics of college grade. For minor work, one year of college physics.

A student majoring in physics is required to take Courses 101-103-105 and 102 unless excused by the department upon satisfactory evidences through examination at entrance. A course of general reading as outlined by the department in each individual case is also required.

For the Master's degree a reading knowledge of French or German is required. It is desirable that this requirement be fulfilled before graduate work is begun.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-103w-105s. Theoretical Physics. Intensive analytical survey of fundamental principles of mechanics, sound, heat, light, electricity and magnetism, designed to supplement the general courses and to prepare students for more specialized courses. Five lectures a week. Prerequisites: 12 credits in physics, Math. 51. Five credits per quarter. MTWFS IV; 2Ph. Mr. Tate.
- 102f. Laboratory Arts. Designed to acquaint students with the methods used in glass-blowing, silvering, etching, metal-to-glass seals, making quartz fibers, soldering, spinning, spot-welding, etc., as a preparation for general experimental work. Two three-hour sessions a week. Prerequisite: 12 credits in physics. Three credits. (1) MW VI-VIII; 2Ph. (2) TTh VI-VIII; 2Ph. Mr. Buchta.
- 104w. Precision Mechanics. Standard methods of precise measurements of length, mass and time. Two three-hour sessions a week. Prerequisites: 12 credits in physics and Math. 51. Three credits. Hours to be arranged. Mr. Buchta.
- 114f-116w-118s. Elementary Physical Investigation. The experimental or theoretical study of physical phenomena the nature or laws of which

- are not as yet understood. Prerequisites: Physics 104, Math. 51. Three credits per quarter. Hours to be arranged. Staff.
- 115f-117w-119s. Problem Course. The work of this course consists entirely in solving problems and exercises designed to give practice in the mathematical analysis of physical problems. Prerequisites: Physics 105, Math. 51. Three credits per quarter. Mr. Buchta.
- 122s. Pyrometry and Heat. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. Prerequisites: Courses 21 and 22. Three credits. MW VI-IX; 23Ph. Mr. Miller.
- 132w. Applied Optics. Special experimental work in spectrometry, optical instruments, photometry, absorption, polarized light. Two three-hour laboratory periods a week. Prerequisites: Courses 31 and 32. Three credits. 3Ph. Hours to be arranged. Mr. Valasek.
- 142f. Electrical Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, magnetic flux. Three two-hour laboratory periods a week. See engineering program. Mr. Zeleny.
- 146w. Electrical Measurements of Precision. Precision measurements of electromotive force, current, resistance, capacity, inductance, and magnetic flux. Use of apparatus of highest precision. Three two-hour laboratory periods a week. Prerequisite: Course 142. Three credits. Hours to be arranged. Mr. Zeleny.
- 148w. Radioactivity. An analytical study of the theories and methods of investigation supplemented by laboratory technique. Those pursuing this course should continue with Chemistry 151, Radiochemistry. Prerequisites: Courses 41 and 42. Three credits. Hours to be arranged. Mr. Erikson.
- 150s. Conduction through Gases. An analytical study of the theories and methods of investigation, supplemented by laboratory technique. Prerequisite: Courses 41 and 42. Three credits. Hours to be arranged. Mr. Erikson.

COURSES PRIMARILY FOR GRADUATE STUDENTS

Physics 101-103-105 and Mathematics 51 are prerequisites for all the courses listed below. The normal sequence of courses after 101-103-105 is 241-243-245 and simultaneously, if possible, 211-213-215 or 211-248-249. For the Ph.D. degree the sequences 221-223-205 and 231-233-235 should be added. All the courses have as many lectures per week as credits.

- 205s. Advanced Dynamics. Conservation of momentum; Hamilton's principle; least action; Lagrange's equations; invariance of Hamiltonian form under contact transformations; and other general principles of dynamics; with a brief indication of modifications required by the restricted relativity theory. The principles will be illustrated by the mechanics of small vibrations, the motion of a rigid body, or by applications to atomic structure. Four credits. Mr. Van Vleck.
- 211f. Atomic Structure and Spectral Lines. Radioactivity; scattering experiments; and structure of the nucleus. Photo-electricity. Simple

- Bohr theory of the hydrogen spectrum. Series notation; survey of non-hydrogenic spectra; and qualitative interpretation by an atomic model with two quantum numbers. Bohr's theory of the physical and chemical properties of the elements. Three credits. Mr. Van Vleck, Mr. Buchta.
- 213w-215s. Quantum Theory of Atomic Structure. A continuation of 211f. The correspondence principle. Relativity fine-structure, Zeeman effect, Stark effect. Inner quantum numbers and multiplets. Relative intensities of spectral lines. X-rays. Critical potentials, excitation of spectra, and other topics in Foote and Mohler's *Origin of Spectra*. Infra-red absorption bands. Quantum theories of dispersion. Three credits per quarter. Mr. Van Vleck.
- 221f-233w. Thermodynamics, Statistical Mechanics, Kinetic Theory. Equations of state; first and second laws of thermodynamics; equation of Clapyron; etc. Statistical mechanics, with relation to thermodynamics. Equipartition: Maxwell's distribution of velocities; viscosity; mean free path; theory of specific heats and dissociation equilibrium, with astro-physical applications. Chemical constants; absolute entropy, and the third law of thermodynamics. Quantum modifications of the classical kinetic theory will be introduced wherever necessary. Three credits per quarter. Mr. Van Vleck.
- 231f. Advanced Optics and Crystallography. Geometrical optics and optical instruments. Interference; diffraction; and polarization; with applications to optical measurements. X-ray analysis; general and characteristic radiation. Crystallographic classification and notation. Analysis of crystal structure by means of X-rays. Four credits. Mr. Valasek.
- 233w. Optical Properties of Materials, Thermal Radiation. Electro-magnetic theories of dispersion; absorption; metallic reflection; crystal optics; optical rotation, magneto- and electro-optics. Thermodynamics applied to the radiation for the black body. Three or four credits. Mr. Valasek.
- 235s. Electro-dynamics of Moving Media. Electro-magnetic theory of optical properties of bodies in motion; field equations for moving media. The experiments of Michelson & Morley, Fizeau, Trouton & Noble. Unipolar induction. The Lorentz transformation and introduction to the restricted theory of relativity. Three credits. Mr. Valasek.
- 241f. Electrostatics. Designed to cover the first half of Jean's *Electricity and Magnetism*. Vector analysis. Fundamental mathematical theorems and processes of analysis applicable to potential theory. Images, spherical harmonics, Fourier series, etc. Four credits. Mr. Van Vleck.
- 243w. Electromagnetism. Magnetic fields; magnetic shells and electric currents; electro-magnetic induction; the circuital relations; the complete current, electro-magnetic waves. The Maxwell-Lorentz equations and their solution; retarded potentials; conservation of energy; energy

- flow; conservation of momentum; radiation from an accelerated electron. Four credits. Mr. Valasek, Mr. Van Vleck.
- 245s. Electrodynamics and Electron Theory. Current flow in continuous media. Large and small scale field equations. Illustration of conservation of momentum by Compton and Doppler effects. Magneto-statics. Dynamical theory of currents. Electro-magnetic mass. Electron theories of conduction. A brief survey of theories of magnetism or introduction to the special theory of relativity will be included if time permits. Three or four credits. Mr. Van Vleck.
- 248w. Thermonics and Thermal Electricity. Peltier effect; Thomson effect; contact difference of potential. Emission of electricity from hot bodies. Phenomena occurring in gaseous and electronic conduction; limitation of current by space charges; ion sheaths, etc. Theories of the electric arc. Fundamental principles of three-electrode vacuum tubes. Three credits. Mr. Buchta.
- 249s. Applied Electricity. Theory of electrical circuits, including radio circuits and filters. Application in various types of electrical apparatus. Applications of three-electrode vacuum tubes. Three credits. Mr. Buchta.
- 252f-254w-256s. Research. Under the special direction of individual members of the staff.
- 261f-263w-265s. Seminar. Study of present day problems in physics. One hour a week. Open to those who are doing graduate work in physics. Three credits. Mr. Tate.

The following courses will be offered provided at any time there is sufficient demand for them:

Hydrodynamics.

Theory of Elasticity.

Ferro-Magnetic Phenomena and Theories of Magnetism.

Advanced Topics in Electron Theory and the Special Theory of Relativity.

The General Theory of Relativity.

Advanced Quantum Dynamics.

The Partial Differential Equations of Mathematical Physics.

Applications of Vector Analysis to Physical Problems.

PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY

Prerequisites.—The Department of Physiology is well equipped for the various types of physiologic investigation. The library facilities are good.

For a minor in physiology, general zoology, general and organic chemistry, and college physics are prerequisites. (In exceptional cases high school physics may be accepted.) For a major, physical chemistry is desirable.

In addition, each student majoring in physiology or physiologic chemistry must have had the general courses, Physiology 100, 101, 103, 104, or the equivalent.

For staff and courses of study offered, see special bulletin of graduate work in medicine.

PLANT-BREEDING

Plant-breeding may be elected as a field for either major or minor work. For prerequisites for specialization and statement of courses of study see announcement under Agronomy and Farm Management.

PLANT PATHOLOGY AND BOTANY

Professors Edward M. Freeman, Elvin C. Stakman; Assistant Professor Julian G. Leach.

Note.—Four courses in botany including plant physiology see Department of Botany.

Prerequisites.—The minimum requirement is (a) three years (27 credits) in botany, one year (9 credits) of which shall be mycology; (b) general bacteriology one quarter (4 credits) or some equivalent; (c) one year (9 credits) in plant pathology—preferably two years (18 credits).

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 105f-106w-107s. Mycology. Morphology, taxonomy, and biology of fungi. Lecture, laboratory, greenhouse, and field work. Prerequisites: Botany 1 and 2 or equivalent. Three credits per quarter. MWF I, II; 1, 32PP. Mr. Freeman, Miss Dossdall.
- 108f. Methods. Plant pathological methods, including mycological and bacteriological technique. Lectures, laboratory, field, and greenhouse work. Special problems. Prerequisites: Course 1 or 10 and Bacteriology 51. Three credits per quarter. Ar. 1, 2PP. Mr. Leach.
- 110w. Principles of Pathology. Comparative biology of plant pathogens; pathological plant anatomy, parasitism, biologic specialization, resistance, and immunity. Prerequisites: Course 1 or 10 and Bacteriology 51. Three credits. MWF III, IV; 1, 2PP. Mr. Stakman, Mr. Henry.
- 111w,su. Diseases of Field Crops. Symptomatology, etiology, and practical methods of control. Laboratory, lecture, and field work. Prerequisite: Course 1 or 10. MWF VI, VII; 1, 2PP. Mr. Stakman, Mr. Christensen.
- 112s. Diseases of Fruit Crops. Especially those important in Minnesota. Laboratory, lecture, and greenhouse work. Three credits. MWF VI, VII; 1, 2PP. (Given in alternate years; not offered in 1925-26.) Mr. Leach.
- 113s. Diseases of Vegetable Crops. Diseases of potatoes and other vegetable crops. Lecture, reference, laboratory, and greenhouse work. Three credits. MWF VI, VII; 1, 2PP. (Given in alternate years; offered in 1925-26.) Mr. Leach.
- 114w. Advanced Forest Pathology. Wood rots, including a study of the deterioration of wood products caused by fungi. Lectures, laboratory, and greenhouse work. Three credits. MWF VIII, IX; 1, 2PP.

(Given in alternate years; offered in 1925-26.) Mr. Stakman, Mr. Leach.

- 116f. Pathological Histology. A study of the histological changes in diseased plants. Lectures, laboratory, and reference work. Three credits. Prerequisites: Course 1 or 10. MWF III, IV; 1, 2PP. Mr. Stakman, Mr. Leach.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 203f-204w-205s. Special Problems. Special assignment of work in laboratory and field problems in pathological research. Mr. Freeman, Mr. Stakman.
- 207f-208w-209s. Research in Mycology. Research work along following suggested lines: taxonomy of natural groups; fungous flora of particular regions, localities, or habitats; investigation of fungi involved in special industrial or natural processes; morphology or physiology of special forms. Prerequisite: Course 105-106-107. For minor or major. Three credits per quarter. Mr. Freeman, Miss Dossdall, Mr. Stakman.
211. History of Plant Pathology. Development of important mycological, pathological, and physiological researches; historical basis of modern science of plant pathology. Two credits per quarter. Mr. Stakman.
213. Seminar. Assigned topics with special reference to current pathological problems. Historical review of literature on special problems and critical study of current literature. Two credits per quarter. Mr. Stakman.

POLITICAL SCIENCE

Professors Cephas D. Allin, William Anderson, Harold S. Quigley, Jeremiah S. Young; Associate Professors John M. Gaus, Morris B. Lambie; Assistant Professor Harold F. Kumm.

Prerequisites.—For major work, 18 credits; for minor work, 13 credits.

Bureau for Research in Government.—This bureau is organized to conduct and direct special investigations in practical political and administrative problems, national, state, and local. Mr. Anderson will act as director, but all members of the staff will take part in the work of the bureau. Advanced and graduate students are strongly urged to take advantage of its facilities.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 102s. Political Parties. The nature, function, organization, and methods of political parties; legal control of parties and elections; public opinion as a factor in popular government. TThS II; 218OL. Mr. Gaus.
- 105s. Colonization. The economic and political factors in colonization; forms of government, commercial policies, and mandates. (Not offered in 1925-26.)

- 111w-112s. Municipal Powers and Functions. The historical development and present range of municipal activities; problems of police, welfare, education, streets, water supply, sanitation, and public utilities; municipal ownership; city-planning. TThS III; 211OL. Mr. Anderson.
113. Municipal Problems. A specialized course in modern, legal, administrative and functional problems of cities. (Not offered in 1925-26.)
- 121f-122w. International Law. Nature, sources, and sanction of international law. The laws of peace, war, and neutrality. MWF IV; 209OL. Mr. Allin.
- 123s. International Organization. Systems of international relations, international administrative organizations, and political guarantees of the past with a detailed study of the League of Nations. MWF IV; 209OL. Mr. Quigley.
124. Problems in International Law. Intensive study of the solution of selected international controversies by national and international courts, arbitration tribunals, and diplomatic conferences. (Not offered in 1925-26.)
- 125f-126w. American Diplomacy. The history, principles, and policies of American diplomacy. MWF III; 221OL. Mr. Shippee.
- 127s. American Foreign Relations. Such topics as the Monroe Doctrine, freedom of the seas, the "open door," arbitration, and disarmament will be considered with particular reference to the future policy of the United States. (Not offered in 1925-26.)
- 130f. Introduction to Administration. Introduction to the administrative aspects of the problems of social control; the formulation of policy, the organization of administration, and control over administration. MWF II; 209OL. Mr. Gaus.
- 131w-132s. Principles of Public Administration. Source of the administrative power; administrative areas; the budget; personnel; purchasing; organization; public service as a career. Special problems relating to education, finance, safety, health, welfare, commerce, labor, and conservation of natural resources. MWF II; 209OL. Mr. Lambie.
- 136f-137w. Far Eastern Government and Politics. The constitutional development of Japan and China; government, parties, and political problems. (Not offered in 1925-26.)
- 138f-139w. Far Eastern Diplomacy. The international relations of China from the earliest period; early contacts between Japan and China; the policy of exclusion gradually overcome by western powers; the opening of the Far East in the nineteenth century; the "open door" policy; the contemporary situation. MWF VII; 211OL. Mr. Quigley.
- 141f. Problems in State Government and Constitutional Law. A selected group of current problems in state government will be studied intensively in their constitutional and political aspects. MWF VI; 221OL. Mr. Kumm.
- 145w. Legislative Power and Methods. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. TThS II; 211OL. Mr. Young.

- 151w-152s. Constitutional Law. Separation of powers; relationship of states to national government; fundamental rights and immunities of citizens; obligation of contracts; due process of law; equal protection of laws. MWF VI; 221OL. Mr. Kumm.
- 155s. Administrative Law. The nature and scope of administrative law with special reference to the law of officers and special administrative tribunals. MWF I; 221OL. Mr. Kumm.
- 157f. Police Power. Nature of the police power; constitutional aspects of social and economic legislation, including safety, order, morals, and protection against business fraud and oppression; the fundamental rights under the police power. TThS II; 211OL. Mr. Young.
- 158s. Government and Business. Governmental powers; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation. TThS II; 211OL. Mr. Young.
- 159w. Law of Public Utilities. The rise and development of the law of public service companies; the rights and duties of such companies; present methods of control. MWF I; 221OL. Mr. Kumm.
- 161s. Comparative Federal Government. Ancient and modern federal unions. TThS II; 209OL. Mr. Allin.
- 166w-167s. Government and Politics of the British Empire. Organization, working, and international status of the Imperial and Dominion governments. MWF II; 211OL. Mr. Allin.
- 181w. Modern Political Thought. (See Philosophy 129.) TWThFS I; 322F. Mr. Wilde.
- 187s. Problems in Democracy. An examination of a few key problems of a democratic society—individual and class differences, opinion, dictatorships, expert knowledge, and leadership. (Not offered in 1925-26.)
190. Jurisprudence. (See Law School program.) Mr. Rottschaefer.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Seminar in Public Law. Mr. Young and others.
- 211f-212w-213s. Seminar in Modern Government and Political Theory. Mr. Allin and others.
- 221f-222w-223s. Seminar in Local Government and Administration. Mr. Anderson and others.
- 231f-232w-233s. Seminar in International Relations. Mr. Quigley and others.

Note.—A student registered in a seminar course will be expected to complete a satisfactory piece of research before receiving credit for the course. The Bureau for Research in Government is designed to give all possible assistance in the conducting of such research, but is not intended to relieve the student of his personal responsibility.

PSYCHOLOGY

Professors Richard M. Elliott, William S. Foster, Karl S. Lashley, Donald G. Paterson; Associate Professor, Herbert Woodrow; Assistant Professor Charles Bird.

Prerequisites.—For either major or minor work, 12 credits.

- 101f-102w†-103s. *Experimental Psychology.* The theory and technique of the leading methods of experimental investigation in human psychology. Individual minor research problems in the third quarter. One lecture, four laboratory hours per week. Six or nine credits. MWF VII; WF VIII; 116Psy. Mr. Foster.
- 108f. *Systematic Psychology.* A comparative study of the problems, methods, and viewpoints of modern psychology. Three credits. TThS III. Miss Heibreder.
- 109w. *Readings in Psychology.* Intensive study of selected topics such as attention, perception, emotion, thinking. For properly qualified students with special interests, much of the classroom work will be replaced by individual assignments. Three credits. TThS III. Miss Heibreder.
- 114w-115s.† *Human Behavior.* An analysis of the development and organization of human behavior. Consciousness or mind, as a property of the living body, is discussed in its dependence upon response. Six credits. TThS II; 109Psy. Mr. Elliott.
- 121f-122w†-123s. *Neuropsychology.* The functions of the nervous system in behavior. Neural basis of reflex, instinct, and habit. Physiology of motivation. Individual investigation of special problem in third quarter. One lecture and five laboratory hours per week. Six or nine credits. MWF VII, VIII; 109Psy. Mr. Lashley.
- 124f. *Psychology of Learning.* Critique of current theories concerning the nature of the learning process. Problems and methods bearing upon the physiology of learning. Not open to students who take Neuropsychology. Three credits. MWF IV; 109Psy. Mr. Lashley.
- 125f-126w.† *Psychology of Individual Differences.* Experimental and statistical study of the influence of sex, race, immediate ancestry, and environment in the causation of individual differences in mental traits. Each student participates in investigation of problems and in analysis of results. Six credits. MWF II; 109Psy. Mr. Woodrow.
- 127s. *Social Psychology.* An examination of the behavior of men in groups, and of some important social institutions, as determined by human motives and traditions. Three credits. MWF II; 109Psy. Mr. Bird.
- 130s. *Vocational Psychology.* Psychology of individual differences in intelligence, aptitudes, interests, and training, with special reference to vocational guidance. Two credits. F IX, X. Mr. Paterson.
- 144w-145s.† *Abnormal Psychology.* Systematic review of psychiatry in relation to normal behavior. Types of social maladjustment; delinquency, criminality, fanaticism. Psychology of creative ability. The organization of personality as revealed by studies in psychopathology. Six credits. MWF IV; 109Psy. Mr. Lashley.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f-201w.† Seminar in the History of Psychology. Selected topics from the history of psychology. Open to advanced students with permission of the instructor. Three or six credits in proportion to work done. Mr. Foster.
- 205s. Advanced Differential Psychology. Three credits. Mr. Paterson.
- 206-207-208. Research in Animal Behavior.
- 210f-211w-212s. Research Problems. Laboratory investigations. Open to graduate students only. Mr. Elliott, Mr. Foster, Mr. Lashley, Mr. Paterson, Mr. Woodrow.
- 215f-216w-217s.† Seminar in Physiological Psychology. Fortnightly meetings attended by teaching staff and advanced students for discussion of some of the fundamental problems of behavior and for reports of research in progress in the laboratory. Three credits. Alternate Th. 7:15-9:15 p.m. Mr. Lashley.
- 220f-221w-222s.† Journal Club and Seminar. Advanced students meet every other week for reports on current publications and discussion of contemporary trends in psychology and related sciences. Attendance of graduate students who are candidates for degrees is required. One credit per quarter.

ROMANCE LANGUAGES

Professors Everett W. Olmsted, Colbert Searles, Irville C. LeCompte; Associate Professors Francis B. Barton, Ruth S. Phelps, Edward H. Sirich; Assistant Professors Jay K. Ditchy, William L. Fichter, Alexander H. Krappe.

Prerequisites.—For major work, 27 senior college credits or equivalent; for minor work, 18 senior college credits or equivalent. Candidates for Master's degree must also have a reading knowledge of at least one other modern language. Candidates for the Doctor's degree must have had at least two years' work in Latin, and are required to take also the course in medieval Latin in the Latin Department. A reading knowledge of a second Romance language and of German is also required.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

FRENCH

- 100w. Diction Française. Etude, théorique et pratique, du français parlé. MWF VIII; 203F.
- 103-104-105.† French Syntax and Composition. Special studies in characteristic problems of French syntax. F V; 203F. Mr. Barton.
- 115-116-117.† French Literature: Seventeenth Century. Reading, discussions and reports. TThS III; 201F. Mr. Searles.
- 118-119-120.† French Literature: Eighteenth Century. Philosophic movement: Bayle, Fontenelle, Montesquieu, Voltaire, l'Encyclopédie, Rousseau. TThS III; 108F. Mr. Sirich.

- 121-122-123.† French Literature: Sixteenth Century. Marot and l'Ecole Lyonnaise. The Renaissance and the Reformation, Rabelais, the Pléiade, and Montaigne. (Not offered in 1925-26.)
- 141s. Realistic Novel: Nineteenth Century. A study of realism with especial reference to the novel. Flaubert, Maupassant, Zola, etc. MTWF VII; 203F. Mr. LeCompte.
- 150-151-152.† French Dramatic Literature. A study of the development of dramatic literature in France from the classical period to the present time. TTh III; 203F. Mr. Olmsted.
- 153s. French Lyric Poetry. Contemporary French Poets. MTWF VI; 212F. Mr. Searles.
- 156w. Molière. MTWF IV; 316F. Mr. Searles.
- 157w. Contemporary French Novel: Bourget, Loti, France, etc. MTWF VI; 217F. Mr. Ditchy.
- 162w. French Romantic Poets. MTWF VII; 203 F. Mr. LeCompte.
- 171-172-173. History of the French Language. Lectures and illustrative texts giving the development of the French language from its origins to the nineteenth century. Especially intended for prospective teachers. Th VIII; 303F. Mr. LeCompte.
- 174-175-176. Lectures in French. TTh IX; 201F. Mr. Ditchy.
- 191-192-193.† Research Methods and Material. Mr. Krappe.

SPANISH

100. Spanish Oral Diction. Exercises in diction, syntax, and vocabulary. (Not offered in 1925-26.)
- 103-104-105.† Spanish Syntax. Special studies in characteristic problems of Spanish syntax. W VIII; 108F. Mr. Arjona.
- 115-116-117.† Spanish Literature: Seventeenth Century. Alternates with 156-157-158. (Not offered in 1925-26.)
- 141w. Spanish Contemporary Novel. TThFS III; 302F. Mr. Fichter.
- 150s. Spanish Dramatic Literature. Contemporary dramatics. TThFS III; 302F. Mr. Fichter.
- 156-157-158.† Spanish Literature: Sixteenth Century. Alternates with 115-116-117. TS IV; 217F. Mr. Krappe.
- 159s. Cervantes. A study of his life and works. Attention will be centered upon *Don Quixote* and the *Novelas Exemplares*. (Not offered in 1925-26.)
- 174-175-176. Lectures in Spanish. Subjects to be announced. TTh IX; 202F. Mr. Arjona.

ITALIAN

- 159-160.† Dante. The *Divina Commedia*. (Alternates with 161-162. Not offered in 1925-26.)
- 161-162. The Sixteenth Century. Reading of texts and study of literary influences. Alternates with 159-160. MWF IV; 203F. Miss Phelps.
164. Dante in English. Lectures, reading, and discussion of the *New Life*, and parts of the *Divine Comedy*. MWF IV; 203F. Miss Phelps.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s. Old French Phonology and Morphology. Lectures on the origin and development of the French language, with practical exercises and reports on assigned topics. Six credits. Mr. LeCompte.
- 204f-205w-206s. Reading in Old French Literature. An introductory course in the reading of Old French. Different types of literature will be read and their origin and development discussed. A certain amount of collateral reading required. Three credits. Mr. LeCompte.
- 207f-208w-209s. Old Provençal. Reading in early Provençal literature with special attention to the poetry of the troubadours. Six credits. Mr. LeCompte.
- 222f-223w-224s. Seminar in Modern French Literature. Six credits. Mr. Searles.
- 241f-242w-243s. Old Spanish Philology. Two credits. Mr. Krappe.
- 244f-245w-246s. Old Spanish Literature. Every year a different genre is studied, such as the epic. Subject to be decided by agreement of students. Two credits. Mr. Krappe.
- 250f-251w-252s. Spanish Seminar. Six credits. Mr. Olmsted.
- 259f-260w-261s. Research in Romance Languages. Credit depends upon amount of work accomplished.

SCANDINAVIAN

Professors Gisle Bothne, Andrew A. Stomberg.

Prerequisites.—For major work, 18 credits; for minor work, 6 credits in the department. All required foreign language credits for the Master's degree in this department may be in either Norwegian, Swedish, or Danish.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f-102w-103s. Modern Norwegian Literature. From 1814 to the present day. Prerequisites: Scandinavian 1-2 and 3-4. Nine credits. TThS II. Mr. Bothne.
- 104f-105w-106s. Modern Scandinavian History. Knowledge of Scandinavian not required. Nine credits. MWF IV. Mr. Stomberg.
- 107f-108w-109s. Modern Swedish Literature. The Swedish novel. Study of a selected list of Swedish classics. Nine credits. MWF V. Mr. Stomberg.
- 117w-118s. Earlier Norwegian Literature. Prerequisite: Scandinavian 102. Five credits. TS III. Mr. Bothne.
- 110w. Ibsen. Prerequisite: Scandinavian 101-102-103. Three credits. Mr. Bothne.
- 111f-112w-113s. Old Norse. (Icelandic). Grammar and reading. Gunnlaug's Saga Ormstungu. Six credits. (Not offered in 1925-26.) TTh V. Mr. Bothne.
- 114f. Strindberg. Prerequisite: Scandinavian 107f-108w-109s. Three credits. Mr. Stomberg.
- 131f-132w-133s. Danish Literature of the Nineteenth Century. From Oehlenschläger to the present time. Nine credits. (Not offered in 1925-26.) Mr. Bothne.

134f-135w. The Landsmaal Movement and Literature. From Aasen to Garborg. (Not offered in 1925-26.) Mr. Bothne.

136s. Björnson. A study of his activity as a central figure in modern Norway. Mr. Bothne.

COURSES PRIMARILY FOR GRADUATE STUDENTS

201-202-203. Seminar in History of Scandinavian Languages. Mr. Bothne.

204-205-206. Etymological Studies. Mr. Bothne.

209-210. Seminar in Modern Swedish Language and Literature. The course is based upon Schuck and Warburg's *Illustrated Svensk Litteraturhistoria* and includes a study of special authors. Nine credits. Mr. Stomberg.

215-216-217. Seminar in Norwegian Literature. The various phases of the cultural development of modern Norway are discussed. The complete works of Björnson or Ibsen are especially studied. Also Holborg and the eighteenth century. Mr. Bothne.

SOCIOLOGY AND SOCIAL WORK

Professors F. Stuart Chapin, Pitirim A. Sorokin; Associate Professor Manuel C. Elmer, Wilson D. Wallis (Anthropology); Assistant Professors Ross L. Finney, Gustav A. Lundquist, Mildred D. Mudgett, Edwin L. Clarke; Special Lecturer Joanna C. Colcord.

Prerequisites.—For major work, 18 quarter credits; for minor work, 12 credits.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

100f. Social Psychology. Primarily for sociology students. The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. TThS II; 9F. Mr. Chapin.

101w. Social Organization. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; the purposive social organization. TThS II; 9F. Mr. Sorokin.

102s. Social Control. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. TThS II; 9F. Mr. Clarke.

103s. Sociology of Conflict. MWF II; 9F. Mr. Clarke.

110w. Methods of Community Organization and Social Work in Small Towns and Country. Concrete problems and methods are emphasized. Th VIII, IX; 9F. Mr. Elmer.

112f. The Rural Social Survey. MWF VIII; 9F. Mr. Elmer.

114s. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. MWF I; 105Ag.Eng. Mr. Lundquist.

115f. The Rural Church As a Social Institution. MWF VII.

- 119f. The Family. The evolution of the family; its various forms and their relation to other social institutions; the service of the family in social evolution; contemporary problems of the family (standards of living, birth rate, feminism, etc.). MWF III; 9F. Mr. Clarke.
- 120f. Social Progress. A study of the basis for social progress in human nature; analysis of fundamental social institutions with regard to their contributions to human advance; necessary social readjustments to convert drift into progress. MWF II; 9F. Mr. Wallis.
- 121w. Advanced Statistical Methods. MWF VII; 5F. Mr. Chapin.
- 122w-123s. Methods of Social Investigation. Methods of gathering and presenting community facts; social statistics; social surveys. Lectures, problems, and field work. MWF VIII; 9F. Mr. Elmer.
- 126-127. Settlement and Community Center Work. (Not offered in 1925-26.)
- 128s. Charitable Administration. A technical study of methods of organizing charitable agencies, of financing them, and of making the public aware of their work. Lectures and practice work. Th VIII, IX; 5F.
- 130s. Advanced Social Case Work. An intensive study of social case work as the basis of practical dealing with problems of dependency and defectiveness. Lectures and conferences. T VIII, IX; 3F. Miss Colcord.
- 132s. Juvenile Courts and Probation. Primarily a course in probation practice work, but prefaced by lectures on social and legal aspects of the juvenile court and probation. (Not offered in 1925-26.)
- 133f. Health Aspects of Case Work. A course open only to students who are properly grounded in case work and who wish to specialize in medical social work. WF and ar IX and ar; 5F. Mrs. Young.
- 134s. Legal Protection of the Child. A study of the relation of law to child welfare. A survey of existing children's protective legislation, of its administration and its future development. MWF I; 5F. Mr. Waite.
- 135s. Field Practice in Legal Protection of the Child. Designed to meet the individual needs of students taking 134. Ar. Ar.
- 138w-139s. Mental Case Work. A study of mental abnormality and its treatment through case work. Lectures and clinical instruction. Th and ar IX; 9F. Mrs. Young.
- 140w. History of Social Theory. From the time of the Greeks, with special reference to the more recent development of sociology. The theories are related to their social backgrounds. MWF II; 5F. Mr. Sorokin.
- 141s. Contemporary Social Theory. An intensive study of developments in the social theory of the late nineteenth and the twentieth centuries. TThS II; 9F. Mr. Sorokin.
- 152s. Problems of Institutional Administration. (Not offered in 1925-26.)
- 153f-154w-155s. Advanced Field Work. Ar. Ar.
- 158w. The Sociology of Revolution. MWF III; 204F. Mr. Sorokin.

187f-188w-189s. Seminar in Educational Sociology. S I, II; 206OL. Mr. Finney.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 200f-201w-202s. Seminar in Applied Sociology. Mr. Elmer.
 204f-205w-206s. Seminar in Social Theory. Mr. Sorokin.
 206f-207w-208s. Seminar: Statistical Theory in Relation to Social Theory and Practice. T 4-6 p.m.; L12. Mr. Chapin.
 209f-210w-211s. Seminar: The Theory of Social Evolution. Mr. Chapin.
 215f-216w-217s. Seminar in Rural Sociology. Mr. Sorokin.
 221f-222w-223s. Graduate Field Training. Twelve hours per week each semester.

SOILS

Professor Frederick J. Alway; Associate Professor Clayton O. Rost; Assistant Professor Paul R. McMiller.

Prerequisites.—For major work, at least two years of work in chemistry, including both quantitative analysis and organic chemistry, and one year of work in general physics. Those students who have not had courses in the elements of geology and mineralogy will be expected to take Geology 1 and 21 during the first year of graduate work. A reading knowledge of French or German is required for the Master's degree. In certain cases where some other modern foreign language would be more valuable in connection with the thesis it may be substituted.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101f. Chemical Analysis of Soils. A laboratory course on the chemical examination of soils, including both fusion and extraction methods for mineral nutrients. Prerequisites: Soils 4 and 5 and quantitative analysis. Five credits. MWF 1:30-5:20; 156Ch. Mr. Rost.
 102f,w,s. Special Problems in Soils. Individual laboratory or field work upon some special soil problem in soil physics, soil chemistry, or soil management. Arrangements must be made in advance. Prerequisites: Soils 4 and 5, and other courses according to problem selected. Three to 5 credits, according to work 156Ch. Mr. Alway, Mr. Rost.
 104s. Soil-Surveying. Field practice in surveying soils and the preparation of soil maps. Prerequisites: Soils 4 and 5. Three credits. Mr. McMiller.
 105w. Minnesota Soils. Detailed study of the soils of Minnesota. Origin, formation, and classification; physical and chemical characteristics; moisture relations; response to manures, fertilizers, and soil amendments; naturally unproductive types and their reclamation. Lectures and laboratory. Prerequisites: Soils 4 and 5. Three credits. TThS III; 251Ch. Mr. Alway.

- 107w. Fertilizers and Manures. Sources, composition, and uses of the various fertilizers, manures, and soil amendments. Lectures and laboratory work. Prerequisites: Soils 4 and 5. Two credits. TS IV; 251Ch. Mr. Rost.
- 108w. Physical Properties of Soils. A laboratory course on the determination of physical constants of soils, including mechanical composition, moisture equivalent and hygroscopic coefficient. Prerequisites: Soils 4 and 5. Three credits. TTh 1:30-5:20; 156Ch. Mr. McMiller.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201w. Classification of Soils. Study of the various systems of classification which have been proposed. Individual work, with assigned readings and conferences. Open only to those graduates who have a reading acquaintance with French and German. Prerequisites: Soils 4, 5, 101, and 108. Three credits. Mr. Alway.
- 202f,w,s. Research in Soils. The investigation in the field, in the laboratory, or in both, of soil problems. The particular problem which a student may select will depend upon his previous training in agronomy, botany, chemistry, geology, and physics. Credit, according to work. Mr. Alway.
- 203w. Seminar in Soils. Review of current literature; presentation and discussion of papers on research; study of methods of investigation of soils. Required of graduate students. One credit. T VII; 251Ch. Mr. Alway.

SURGERY

(Including divisions of General Surgery, Experimental Surgery, Orthopedic Surgery, Urology, and Dental Surgery.)

For staff and courses of study offered, see special bulletin of graduate work in medicine.

VETERINARY MEDICINE

Professors Clifford P. Fitch, Myron H. Reynolds.

Prerequisites.—For major work, 12 credits; for minor work, 6 credits in the department.

COURSES FOR UNDERGRADUATE AND GRADUATE STUDENTS

- 101w-102s. 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. Mr. Kernkamp.
- 103f-104w. Advanced Comparative Physiology. An advanced course in physiology the domestic animals, including laboratory work with special emphasis on animal nutrition. Mr. Hewitt.

COURSES PRIMARILY FOR GRADUATE STUDENTS

- 201f-202w-203s-204su. Problems in Animal Sanitation. Losses to animal husbandry from disease. Causes and prevention of such losses. Organization of sanitary control work. Mr. Reynolds.
- 205f-206w-207s-208su. Veterinary Pathology and Bacteriology. Advanced problems. Specially adapted to meet the needs of graduate students. Offered as major or minor work. Credits to be arranged. Mr. Fitch.

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

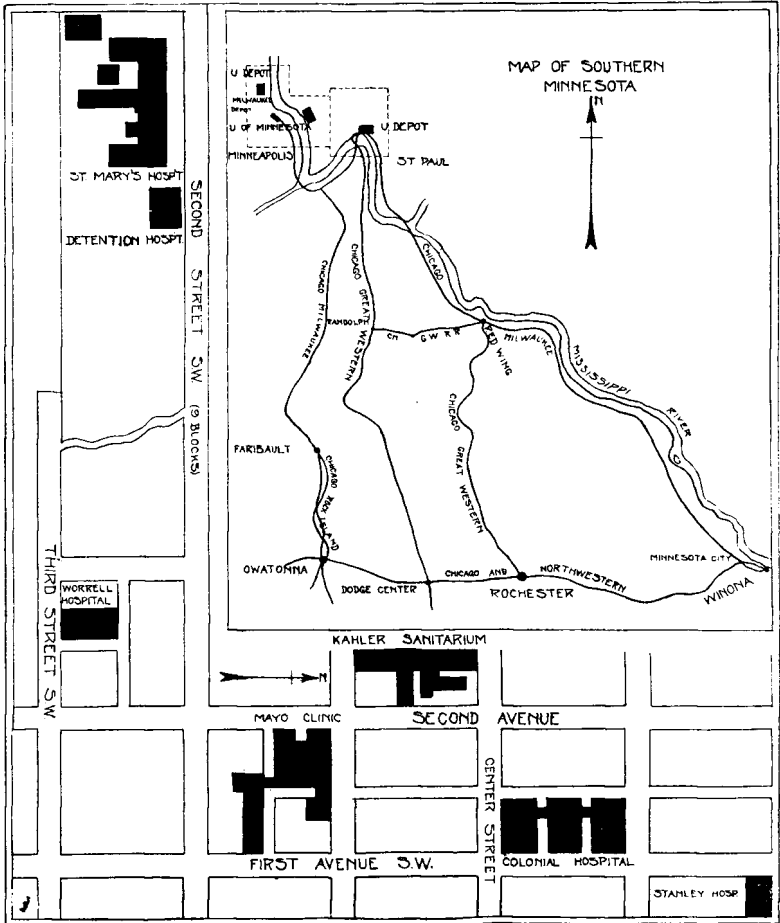
The Graduate School
Announcement of Graduate Work in
Medicine in the Medical School
and the Mayo Foundation
1924-1926



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Map of a portion of Rochester showing clinics and hospitals serving the Mayo Foundation for teaching purposes.

UNIVERSITY CALENDAR

1924-1925

1924			
September	22-October	18	Registration of graduate students Physical examinations for all students
September	29	Monday	Fall quarter begins, 8:30* a.m.
October	9	Thursday	Examinations in German and French for candidates for all advanced degrees
November	4	Tuesday	Election Day; a holiday
November	11	Tuesday	Armistice Day; a holiday
November	22	Saturday	Last day for filing thesis subject of candidate for the Master's degree
November	27	Thursday	Thanksgiving Day; a holiday
December	18	Thursday	Commencement convocation
December	20	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
1925			
January	5	Monday	Christmas vacation ends, winter quarter begins, 8:30* a.m.
January	8	Thursday	Examinations in German and French for candidates for all advanced degrees
February	12	Thursday	Lincoln's birthday; a holiday
March	21	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.
March	30	Monday	Spring vacation ends, spring quarter begins, 8:30* a.m.
April	9	Thursday	Examinations in German and French for candidates for all advanced degrees
April	10	Friday	Good Friday; a holiday
May	9	Saturday	Last day for filing theses of candidates for all advanced degrees
May	30	Saturday	Memorial Day; a holiday
June	1	Monday	Last day for written examinations for candidates for all advanced degrees
June	2	Monday	Last day for oral examinations for candidates for all advanced degrees
June	6	Saturday	Last day for filing bond for publication of Doctor's thesis; last day for depositing binding fee for Master's thesis
June	13	Saturday	Spring quarter closes
June	14	Sunday	Baccalaureate service

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

June	15	Monday	Fifty-third annual commencement
June	22	Monday	Summer Session, first term begins, 8 a.m.
July	4	Saturday	Independence Day; a holiday
July	17	Friday	Last day for filing thesis of candidates at summer convocation
August	1	Saturday	Summer Session, first term closes
August	3	Monday	Summer Session, second term begins
September	5	Saturday	Summer Session, second term closes

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

GRADUATE WORK IN MEDICINE

ORGANIZATION

The graduate work in medicine in the Medical School and the Mayo Foundation is a part of the work of the Graduate School of the University. Its management is entrusted by the Board of Regents to a committee composed as follows:

The President of the University, Lotus Delta Coffman, Ph.D., LL.D.
 The Dean of the Graduate School, Guy Stanton Ford, Ph.D.
 The Dean of the Medical School, Elias Potter Lyon, Ph.D., M.D., D.Sc.
 The Director of the Mayo Foundation, Louis B. Wilson, M.D.
 Clarence Martin Jackson, M.S., M.D., of the Medical School
 Jennings C. Litzenberg, B.S., M.D., of the Medical School
 Arthur C. Strachauer, M.D., F.A.C.S., of the Medical School
 S. Marx White, B.S., M.D., of the Medical School
 Donald C. Balfour, M.D., of the Mayo Foundation
 William F. Braasch, B.S., M.D., of the Mayo Foundation
 Melvin S. Henderson, M.D., of the Mayo Foundation
 Leonard G. Rowntree, M.D., D.Sc., of the Mayo Foundation

GENERAL INFORMATION

The graduate work in medicine here outlined is not intended for those seeking brief practitioners' or review courses. Opportunities of this kind are to be found in the bulletin of the Medical School.

History.—In the fall of 1914, the University of Minnesota began graduate work in various fields of medicine and surgery in addition to that already offered for some time in the laboratory branches. The conditions laid down for this work as regards admission, residence, thesis, and examinations were those already applied by the Graduate School in approving all candidates for graduate degrees.

The training of medical graduates for special work in pathology, clinical medicine, and surgery by means of internships, residencies, and assistantships had been developed in the Mayo Clinic at Rochester, until in 1912 definite three-year services in these subjects for graduates in medicine, who had previously had one year's internship in a general hospital, were provided. These services were designated "fellowships," a term intended to cover internships, assistantships, residencies, and so forth. In order to perfect the organization and place the work on a permanent basis, February 9, 1915, a corporation, the Mayo Foundation for Medical Education and Research, was founded by William J. and Charles H. Mayo. On June 9, 1915, the University of Minnesota and the Mayo Foundation for Medical Education and Research entered into an agreement, by the terms of which the funds and income of the Mayo Foundation for Medical Education and Research are devoted, under the direction of the regents of the University of Minnesota, to the promotion of graduate work in medicine and to research in this field. On September 13, 1917, the funds and income of the Mayo Foundation were transferred entirely to the regents of the University.

Purpose.—In an age of specialization with the development of graduate work in all fields and phases of the sciences, letters, and arts, such educational work needs no elaborate justification. In a subject like medicine, intimately connected with established fields of research such as biology, chemistry, anatomy, physiology, pathology, and bacteriology the need for scientific research and for the training of scientific specialists, investigators, and teachers is as great as in any subject, and of as vital importance.

The possibilities of such work hitherto have suffered less from neglect than they have from the lack of organization, standardization, and certification by the educational institutions which have found it possible and advisable to put such applied subjects as agriculture, education, engineering, and commerce upon a scientific basis, and have freely recognized the accomplishments of trained students by the granting of higher earned degrees in these fields. In medicine in the United States, the leading specialists in practice and the trained productive investigators have usually been developed by long years in internships, minor teaching positions, hospital residencies, or personal apprenticeships to other specialists. A few have obtained their

special training in general practice, gradually narrowing to a particular field. Many men in both groups have broadened themselves by visits to other laboratories and clinics for observation and by longer or shorter periods of foreign study. A much larger body of clinical specialists of varying attainments have been developed by so-called postgraduate or poly-clinic medical courses or by the simple and convenient method of self-proclamation.

Taken as a whole, by such undirected processes graduate students are apt to waste time on unessentials and to acquire very inadequate knowledge of many of the essentials. In clinical branches such processes fail to provide any sure protection to the public against the untrained specialist or to open any avenue to the public's confidence for the properly trained specialist. And medical education, if it is to advance, must at least be able to supplement a faculty of skilled practitioners with men trained to carry forward the frontiers of medical science.

The objects of this graduate work in medicine are accordingly the training for medical practice of fully equipped and properly certified specialists and of investigators and teachers of medicine.

Standards.—In graduate work in medicine the University of Minnesota, in order to secure results and safeguard scientific standards, adopted those general policies and methods already indicated by the established graduate work in other sciences. The development has depended upon the maintenance of real standards of admission, the supply of qualified advisers to graduate students, the provision of adequate laboratory, clinical, and library equipment, and the institution of rigid tests in course and examinations in residence, with evidence of the power of productive research on the part of the student as evidenced in a thesis.

In doing this work the University of Minnesota is not seeking to multiply the opportunities for securing simply technical training through practitioners' courses. The graduate work is definitely intended to provide opportunities in three years of work for the well-prepared serious-minded student to fit himself in the science, as well as in the art, of some special field of medicine or surgery. Entrance upon the work and continuance in it, as well as the holding of scholarships or fellowships in the Medical School or on the Mayo Foundation, will be strictly conditioned upon evidences of power and growth along scientific lines. The value of technical or mechanical skill as a practitioner or operator has its place, but will be subordinated to, and measured by, the power and product of the brain that guides the hand. From the standpoint of both the University and the prospective student it is highly important that this distinction in purpose be kept clearly in mind.

By the present arrangement of courses in arts, science, and medicine a properly prepared student may enter the University, and in seven years secure the usual doctorate degree in arts, in science, or in medicine. The object of the plan pursued at this University since 1914 is to provide three years of additional work on the basis of the degree of doctor of medicine,

and leading to the special degree of master of science (M.S.) or doctor of philosophy (Ph.D.) in medicine, in surgery, in pathology, etc.

In clinical branches the degree of master of science is intended primarily to indicate scientific proficiency. To be recommended for this degree the candidate must have given evidence by two or three years of residence that he is competent to begin the practice of a clinical specialty in a scientific manner without the supervision of others. The doctorate of philosophy in clinical subjects will be given only to those men who have given evidence not only of proficiency at least equal to that required for the Master's degree, but who in addition present evidence of well-marked ability to advance medical science.

Work in public health.—By the choice of appropriate studies students may prepare themselves to follow various careers in public health work. Graduate students with the proper qualification may prepare themselves to serve as specialists in certain fields of public health work or they may procure a thoro general training with a certain amount of practical experience in public health.

Such undergraduate and graduate students as satisfactorily fulfill the requirements of the University will be granted appropriate degrees.

Further inquiries concerning the above mentioned courses and curricula should be addressed to Dr. H. S. Diehl, Millard Hall, University of Minnesota.

Laboratory equipment.—The laboratory equipment for the prosecution of graduate work in medicine is located in Minneapolis, St. Paul, Rochester, and Pokegama.

The laboratory branches are well housed in excellently equipped buildings on the campus at Minneapolis and at Rochester. Anatomy, chemistry, pathology, and bacteriology are in modern University buildings especially designed for them. Physiology, physiologic chemistry, and pharmacology are located in Millard Hall, a modern building of the best type. The laboratories for experimental medicine and surgery and extensive animal quarters are also in this building. The University museums of anatomy, pathology, and surgery contain a large number of specimens available for teaching purposes.

In Rochester, the laboratories of general pathology, pathologic anatomy, clinical pathology and bacteriology, physiologic chemistry, roentgenology, photography are in the Mayo Clinic Building, as is also the pathologic working museum, which contains over 150,000 specimens. The Institute of Experimental Medicine provides facilities for all experimental work in physiology, pathology, bacteriology, and surgery.

Laboratories of surgical pathology are at St. Mary's, Colonial, Worrell, and Kahler hospitals. The metabolic laboratory is at the Kahler Hospital. Electrocardiographic laboratories are maintained in the Clinic Building and in the Kahler Hospital. A laboratory of physiologic chemistry is at St. Mary's Hospital. A farm for experimental animals is maintained outside the city.

Clinical equipment.—The University owns and controls Elliot Memorial Hospital with its service building. This provides a clinic of 200 beds, and has the accumulated hospital records of ten years. Approximately 100 beds will be added in 1925 by the completion of the George Chase Christian Memorial Cancer Institute and the Todd Memorial Hospital. The Out-Patient Department of the hospital is housed in Millard Hall and received 15,747 new patients and 66,127 patients' visits during the year ending June 30, 1921.

The State Hospital for the Crippled and Deformed at Phalen Park, St. Paul, offers the University full participation in its clinical opportunities.

The city hospitals of Minneapolis and the City and County Hospital of St. Paul, representing in all some 1,400 beds, exhibit every phase of clinical service in their wards and amphitheatres. This material, and also that of the new Miller hospital, St. Paul, is available for graduate work.

In Rochester, St. Mary's, Colonial, Worrell, Curie, Alfred, and Kahler hospitals and the Damon Sanitarium have an aggregate of about 1,500 beds with twelve operating rooms for general surgery and six for diseases of the organs of the special senses. All patients are examined clinically in the Mayo Clinic Building and its annexes. In 1923, 56,320 patients were examined. In addition more than 475,000 clinical histories are on file and available for investigative studies. During 1923, 20,543 operations were performed.

Consent for post-mortems is obtained with about 85 per cent of patients dying in the clinic.

The working museum contains more than 150,000 pathologic specimens. All case histories and specimens are classified and arranged so as to be readily available for scientific research.

Arrangements have been made whereby fellows or other graduate students in medicine may divide their time, part of their work being taken in the Mayo Foundation at Rochester, and part in the Medical School at Minneapolis and St. Paul.

Libraries.—Besides the University Library and the departmental libraries, there are at the disposal of the student the general medical and biological libraries in the new University Library and the Mayo Clinic Building, and the collections of the Hennepin County and Ramsey County Medical Societies. Current issues and complete files of the most important medical periodicals are available either in Minneapolis or Rochester.

Methods of study.—Every attempt is being made to establish the graduate work in medicine on a true University basis. Little class work is done. No short cramming courses are offered. The Mayo Foundation lectures at Rochester and frequent special lectures at the Medical School, are given by men who are enthusiastically interested in their particular topics, but each lecturer presumes that his hearers are already well grounded in the fundamentals of his subject. Attendance at these lectures is purely optional with the graduate student. No quizzes are held and no examinations are given on these lectures. The same is true of the clinical and laboratory

demonstrations and departmental seminars. Everything is done to impress the graduate student that his residence is an opportunity for him to find out things for himself and not a period in which he will be instructed by undergraduate methods. The student's work is carefully graded by his immediate chief, whose duty it is to determine the student's ability by daily intercourse with a smaller number of students rather than by class quizzes and formal examinations. Students holding fellowships who do not evince strong personal initiative will not be recommended for annual reappointment, or may be asked to resign their fellowships before the end of their period of appointment. In the arrangement of work the best opportunities will be consistently given to the best qualified men. Low-grade and mediocre men will not be permitted to continue to fill appointments to the exclusion of high-grade men. Work which receives a grade below B will not be counted for graduate credit in the major field, nor if below C in the minor.

Registration and number of students.—All students entering upon graduate work in medicine will register with the dean of the Graduate School. Students who begin their residence work in Rochester may fulfill the preliminary requirements by registering there with the director of the Mayo Foundation.

The number of graduate students who will be registered for work is determined by the clinical opportunities. This limitation applies to those doing their major work in clinical medicine and surgery and not to those majoring in the laboratory departments.

Tuition.—The tuition fee for the graduate work in clinical medicine and surgery for those not holders of fellowships or otherwise entitled to exemption is \$60 per quarter. For students in the fundamental laboratory branches, the tuition fee is \$10 per quarter. Extra fees may be charged to cover the cost of materials and supplies for exceptional laboratory experimentation. The fees for graduate work in the Summer Session are stated in the special Summer Session bulletin. Fellows, scholars, and members of the teaching or scientific staff are exempt from tuition.

Fellowships and scholarships.—Teaching fellowships in the Medical School are now established as follows: in surgery, 2; in internal medicine, 2; in obstetrics, 2; in ophthalmology and oto-laryngology, 2; in mental and nervous diseases, 2; and in pediatrics, 3. These include fellowships in the Minneapolis General Hospital. Three fellowships are also available in the University Health Service. They carry a stipend of \$600 the first year, \$750 the second, and \$1,000 the third. These teaching fellows are required to devote their entire time (excepting an annual vacation of three weeks) to graduate work, including a small amount of teaching.

Similar teaching fellowships have been established in the fundamental laboratory department of the Medical School as follows: in anatomy (including histology and embryology), 3; in physiology and physiologic chemistry, 1; in pathology, 1; in pharmacology, 1. These fellowships carry a stipend of \$900 the first year, \$1,200 the second, and \$1,500 the third year.

They require a small amount of teaching, the remainder of the time being devoted to graduate work leading to advanced degrees.

In addition, there are at Minneapolis 5 scholarships, without stipend, carrying free tuition with opportunity for graduate study in any of the clinical departments.

The attention of prospective medical graduate students is also called to the Shevlin Fellowship in medicine yielding \$500 and tuition. Applications should be in the hands of the dean of the Graduate School before March 1.

The Mayo Foundation carries the following fellowships: in clinical and experimental surgery, 63; in orthopedic surgery, 6; in ophthalmology, 4; in rhinology and oto-laryngology, 8; in dental surgery, 6; in clinical and experimental medicine, 45; in neurology, 2; in dermatology, 4; in urology, 6; in roentgenology, 4; in pathology, 4; in bacteriology, 2; in chemistry, 2. The fellowships in clinical branches pay \$600 the first year, \$750 the second year, and \$1,000 the third year. The fellowships in pre-clinical branches pay \$900 the first year, \$1,200 the second year, and \$1,500 the third year. They require full time with an annual vacation of two weeks. During residence in a hospital \$25 per month is deducted from the stipend for board and room.

Nominations for fellowships on the Mayo Foundation are made each quarter, beginning with July 1, for residence to begin six months later or as vacancies occur. In the Medical School appointments are made as vacancies occur.

The Miller Hospital Clinic, St. Paul, supports four clinical fellowships, one each in surgery, medicine, ophthalmology and oto-laryngology, and obstetrics and gynecology. Appointments are made as vacancies occur. Apply through the Graduate School.

All appointments are made for one year and are renewable annually for a period of three years upon the basis of satisfactory progress in the work pursued. Requests for blanks for application for fellowships and scholarships should be addressed to the dean of the Graduate School, University of Minnesota, Minneapolis, Minnesota, or to the director of the Mayo Foundation, Rochester, Minnesota.

Assistantships.—A few qualified assistants, such as traveling fellows from other universities, officers of the medical corps of the United States Army, Navy, or Public Health Service, et al., designated as special students and not candidates for degrees may be accepted at Rochester in laboratory and clinical branches for short periods. The number is necessarily limited in order not to interfere with the work of the resident fellows. Correspondence concerning this work should be directed to the director of the Mayo Foundation, Rochester, Minnesota.

Several of the departments in the Medical School (including Anatomy, Physiology, and Pathology) have paid assistantships which may furnish means of self-support while the holder is pursuing graduate work. For further information, address the dean of the Medical School.

Clinical and class work for visiting or resident practitioners.—In order that there may be no misunderstanding, it should be stated that the graduate work for a limited number, described above, in no way changes or modifies the opportunities for observation hitherto extended visiting physicians and surgeons by the Mayo Clinic in Rochester, or the arrangements offered in Minneapolis by the Medical School for practitioners who wish to attend such undergraduate medical classes as may be of profit to them without interfering with the regular work of the staff and students of the Medical School. Inquiries concerning these opportunities should be addressed to the dean of the Medical School, Millard Hall, Minneapolis, Minnesota.

Summary of requirements.—The various steps involved in the requirements for the degree of doctor of philosophy (Ph.D.) in any one of the clinical or laboratory departments are briefly summarized on pages 17 and 18. The requirements for the Master's degree (M.A. or M.S.) are also indicated. Further information concerning graduate work in general may be found in the general Graduate School bulletin.

Requirements for advanced degrees in medicine.—1. Selection. In the selection of graduate medical students, and in making appointments to fellowships for medical graduate work, preference will be given, other things being equal, to students who have an unusually good training in the fundamental medical sciences (i.e., anatomy, physiology, pathology, etc.) through which they should make their approach to the specialty which they wish to take as a major subject.

2. Admission. All graduate students are admitted by the dean of the Graduate School. Entrance upon work for the advanced degrees of master of science (M.S.) or doctor of philosophy (Ph.D.) in the clinical departments of medicine is limited to those who have: (a) the Bachelor's degree in arts or science, or its equivalent;* (b) the degree of doctor of medicine from acceptable institutions (i.e., those in Class A of the American Medical Association); and (c) one year's experience as an intern in an approved hospital or as an assistant in a laboratory in an acceptable medical school. In the fundamental laboratory sciences (anatomy, physiology, bacteriology, pathology, and pharmacology) properly prepared students may be admitted without (b) and (c) as candidates for the Master's degree (M.A. or M.S.) or the Doctor's degree (Ph.D.).

3. Licensure. Graduate students working in any field of clinical medicine must be licensed to practice in Minnesota within six months after beginning their work in either the Medical School or the Mayo Foundation.

Upon entrance to the Graduate School, the candidate, with the approval of the dean, will select his adviser in the field of his major work. With the approval of his adviser and the dean, he will outline a study program for the year, and if possible for the period of residence.

* Students who have completed at least two years of pre-medical collegiate work, making an equivalent of the seven years combined Arts-Medicine Course at the University of Minnesota, are eligible for admission as graduate students.

The study program for the entire three years must be submitted at the beginning of the second year. This program requires approval of the student's adviser, by the dean, and by the Medical Group Committee.

4. Residence. For the Doctor's degree (Ph.D.) at least three full years of successful graduate study are required, including certain special requirements noted below. For the Master's degree (M.S.) in clinical subjects, two or three years are required. For the Master's degree in the laboratory sciences a minimum of one year of residence is required.

5. Language requirements. A reading knowledge of French and German in the field of the candidate's major must be certified by the professors in charge of these languages at least one year before the Doctor's degree is conferred, and before admission to the preliminary examination. The candidate's adviser or his representative is expected to attend this examination and to furnish appropriate literature for the test. For the Master's degree in the laboratory sciences, a reading knowledge of one foreign language is also required, which must be certified before the end of the second quarter of the year in which the candidate expects to present himself for the degree. For the Master's degree (M.S.) in the clinical branches, the language certificate is optional.

6. Minor. With the approval of his adviser and the dean of the Graduate School, each student upon entrance selects a minor, which must be logically related to his major subject, and (for the Doctor's degree) must be completed by the end of the second year. The minor is preferably a laboratory subject in some other department, and should amount to not less than one sixth of the total work for the degree. At least one sixth of the work offered for the degree in a clinical subject should consist of graduate work in the fundamental laboratory branches, which will serve as a basis for the proposed clinical specialization. This fundamental work should be concentrated in the first part of the course so far as possible. The final examination in the minor for the Doctor's degree is included in the preliminary examination, as noted below. For the Master's degree no special examination is required in the minor, aside from the usual course examinations,

7. Major. The major is that department in which the student desires to specialize. Together with the thesis, it should occupy at least two thirds of the total work for the degree. At least one year before attaining the Doctor's degree, the following procedure is required in order that the candidate may become eligible for the preliminary examination. In addition to the completion of the minor work and of the language requirement, he must have the written approval of the department committee (which includes the graduate faculty members) of the major subject. The statement of the department committee should include the subject of the special problem for the thesis, and should certify as to the ability of the candidate to meet all requirements for the degree sought. It should be based on the quality of the candidate's daily work in residence.

8. Certificate of proficiency. Each candidate in a clinical field must have a certificate of proficiency signed by all members of the faculty with whom he has served, stating that in their opinion he is competent to begin the practice of medicine in his major field in a scientific manner without the supervision of others.

9. Admission to candidacy. For the Master's degree, students who have met the language requirement, whose daily work in residence as indicated by quarterly grades has been satisfactory, and whose thesis subject has been properly approved, are admitted to candidacy at the end of the second quarter by vote of the Executive Committee of the Graduate School. For the Doctor's degree, the student is required to pass a preliminary examination, as noted below, before admission to candidacy.

10. Preliminary examination. At least one calendar year before the Doctor's degree is conferred, a preliminary examination of the student shall be given by a committee appointed by the dean and including the student's adviser as chairman, a representative of the Medical Graduate Committee (other than the adviser), the head of his major department, a representative of the minor, and such additional members as the dean may consider necessary. Certificates of proficiency in French and German, completion of the minor work, and the recommendation of the major department shall be required before admission to this examination. The examination is in addition to the usual course examinations. It shall cover the graduate work previously taken by the student, and *may include any work fundamental thereto*. The field of the candidate's specialization and the thesis are reserved for the final examination. The examination is both oral and written, the latter being arranged by faculty representatives from both Minneapolis and Rochester. Only after the successful completion of this examination may the student be enrolled as a candidate for the Doctor's degree. Students failing to pass this preliminary examination shall not be re-examined until at least one quarter has passed.

11. Thesis. Each candidate for an advanced degree (Master's or Doctor's) must submit a thesis. For the Master's degree, the subject of the thesis should be filed with the dean of the Graduate School by November 15. The subject must be approved by the adviser and by the Medical Graduate Committee. The topic should be within the field of the major, and the thesis should represent approximately half of a year's work of the student. The thesis must be written in acceptable English. It must show ability to work independently and give evidence of power of independent thought both in perceiving problems and in making satisfactory progress toward their solution. Familiarity with the bibliography of the special field and correct citation of authorities are expected.

The Master's thesis must be typewritten in triplicate, one copy on a special form of linen stock, the other two as carbon copies. Samples of the paper required should be examined in the dean's office. The three copies of the thesis must be filed in the dean's office not later than six weeks before graduation. The thesis will be examined by a committee appointed by the

dean, on recommendation of the Medical Graduate Committee. Unanimous approval by the thesis committee is necessary for the acceptance of the thesis. If the thesis is accepted, the candidate must deposit with the registrar, at least one week before commencement, the sum of one dollar for binding one copy of the thesis, which will be cataloged and deposited in the University Library.

For the Doctor's degree, a more elaborate thesis is required. The subject is to be stated in the written department recommendation, which precedes the preliminary examination at the end of the second year. The accumulation of material for the thesis should be started much earlier. The thesis must give evidence of originality and power of independent investigation. It must embody results of research forming a real contribution to knowledge and must exhibit a mastery of the literature of the subject and a familiarity with the sources of knowledge. The matter must be presented with a fair degree of literary skill. The kind of work required in theses for advanced degrees in medicine is exemplified in the volume, *Papers from the Mayo Foundation and the Medical School*, published by W. B. Saunders Company, Philadelphia, 1921.

The thesis must be typewritten in triplicate, to facilitate reading by the thesis committee. The three copies must be filed in the dean's office not later than six weeks before graduation together with a summary or abstract. The dean will appoint a thesis committee with the student's adviser as chairman. Unanimous approval by this committee will be necessary for the acceptance of the thesis. If the thesis is accepted, the candidate must deposit with the registrar, not later than one week before commencement, a sufficient bond to cover the costs of printing as laid down in the regulations adopted June 12, 1922. A copy will be furnished on request.

12. Final written examination. In addition to the usual course examinations in all subjects where such are given, the candidate for the Master's degree must pass a final written examination in the field of the major. (No *special* final examination is required in the minor.) The final written examination will be held not later than four weeks before commencement. It is given by the members of the graduate faculty in the major department, the adviser acting as chairman. This examination shall cover all the work done in the major, and may include any work fundamental thereto.

For the Doctor's degree, a final written examination in the major subject is similarly given, after the thesis is presented and at least four weeks before commencement.

13. Final oral examination. If all other requirements for the degree have been met, including the final written examination and the acceptance of the thesis, the final oral examination will be held not less than two weeks before commencement.

For the Master's degree, the adviser will act as chairman of the examining committee, which will include all the instructors with whom the student has taken work, the thesis committee, and ex-officio, the head or chairman of the department in which the major work is done. Any mem-

ber of the graduate faculty may attend as a visitor, and written notice shall be sent by the chairman of the committee to all members of the graduate faculty in the major and minor departments. The final oral examination will cover all the work offered for the degree, and may include other work fundamental thereto. All final examinations for the higher degrees in medicine will include questions on the history of medicine with special reference to the candidate's major field. At the close of the examination, the committee will vote upon the candidate, taking into account all of his work. A majority vote is required for approval.

For the Doctor's degree, the committee conducting the final oral examination will consist of the adviser as chairman, of a majority of the members of the graduate faculty in the major department, and of at least three other members of the graduate faculty appointed by the dean. At least one member of this committee shall be from a group other than the one in which the major department is included. This examination is to cover the special field of knowledge represented by the major work, including the thesis problem, and shall not exceed three hours. The date of the final oral examination for the doctorate shall be publicly announced, and the examination shall be open to any member of the graduate faculty. Upon completion of the examination, a formal vote of the committee shall be taken and an affirmative vote of at least two thirds of the members shall be necessary for recommendation of the candidate for the degree.

14. Recommendation by the faculty. The dean will report to the graduate faculty the names of those who have completed the requirements for the Master's and Doctor's degrees, and those duly approved will be recommended by the faculty to the Board of Regents of the University. Unless excused by the dean of the Graduate School and the president of the University, all candidates are required to be present at commencement when the degrees are conferred.

A tabular summary of requirements for the Master's degree follows:

WORK	UNDER THE DIRECTION OF	DATE
Program, major and minor	Adviser and dean of the Graduate School	On entrance.
Approval of thesis subject.	Adviser and group committee	November 15.
Language requirement.....	Adviser and language department	Before close of second quarter.
Approval of candidacy.....	Executive committee	Beginning of third quarter.
Filing of thesis.....	Dean of the Graduate School.	Six weeks before graduation.
Examination of thesis.....	Thesis committee	Before admission to final oral examination.
Final written examination in major.....	Major department members of the graduate faculty....	Not later than four weeks before commencement and before final oral.
Final oral examination on all work.....	Thesis committee; all instructors; head of major department	Not later than two weeks before commencement
(Course examinations as required at the usual time.)		
Fee for binding thesis....	Registrar	One week before commencement.

(For the Master's degree in clinical subjects, the dates refer to the last year.)

See tabular summary of requirements for the Doctor's degree below.

WORK	UNDER THE DIRECTION OF	DATE
FIRST YEAR		
Major	Adviser and dean of Graduate School	
Minor	Adviser and dean of Graduate School	
SECOND YEAR		
Tentative program of entire second and third years' work.....	Adviser, Medical Graduate Committee, and dean of Graduate School	Before beginning work of second year.
Major, including thesis..	As for tentative program....	
Minor	Adviser and minor department	Before admission to preliminary examination.
Language	Adviser and language department	One calendar year before degree is to be conferred.
Recommendation	By major department.....	
Preliminary examination	Special committee	
THIRD YEAR		
Major, including thesis..	Adviser, Medical Graduate Committee, and dean of Graduate School	
Filing of thesis.....	Dean	Six weeks before graduation.
Approval of thesis.....	Thesis committee	Before admission to final oral examination.
Final written examination in major.....	Major department members of the graduate faculty....	Four weeks before commencement and before final oral examination.
Final oral examination..	Adviser, majority of members of major department, and other members appointed by dean of Graduate School	Not later than two weeks before commencement.
Bond for publication of thesis	Registrar	Not later than one week before commencement.

DESCRIPTION OF COURSES

The various divisions are grouped under the following departments:

1. Anatomy (including histology and embryology).
2. Physiology and Physiologic Chemistry.
3. Pharmacology and Therapeutics.
4. Pathology.
5. Bacteriology and Immunology.
6. Medicine (including general medicine, dermatology, and mental and nervous diseases.
7. Pediatrics.
8. Surgery (including general surgery, experimental surgery, orthopedic surgery, urology, and dental surgery).
9. Obstetrics and Gynecology.
10. Ophthalmology and Oto-Laryngology.
11. Radiology.
12. Preventive Medicine and Public Health.

In each department the work is described in two separate groups: A—that given in the Medical School, and B—that given in the Mayo Foundation. All courses are numbered for purposes of registration. The courses given in the Mayo Foundation are given the special prefix M. The suffixed f, w, s, and su indicate fall, winter, spring, and summer quarters, respectively. The hyphen denotes courses continuous through the quarters indicated. Suffixed letters separated by commas indicate the repetition of the course in the corresponding quarters. The courses numbered between 100 and 200 are less advanced in character, and in some cases are open as electives to properly qualified undergraduates. The courses above 200 are primarily graduate in character, of the more advanced or research type.

ANATOMY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professors Clarence M. Jackson, M.S., M.D., John B. Johnston, Ph.D., Thomas G. Lee, B.S., M.D., Richard E. Scammon, Ph.D.; Associate Professor Andrew T. Rasmussen, Ph.D.

The Institute of Anatomy offers excellent facilities to students who wish to take advanced work or to pursue investigations in anatomy.

The prerequisite work for all students who desire a major or minor in the Department of Anatomy includes general zoology (animal biology), 6 semester hours, and advanced zoology or elementary courses in anatomy (including histology, embryology, and neurology), 6 semester hours. In addition, each student who desires a major in anatomy must have had the elementary courses in that branch of anatomy in which he desires to specialize—gross anatomy, histology, embryology, or neurology. Students majoring in clinical subjects who desire a minor in anatomy must have had the courses in anatomy usually required of medical students (including Courses

103, 107, and 111). A reading knowledge of either French or German is required of students who desire a major in anatomy for the Master's degree, and a reading knowledge of both French and German is required of those who are candidates for the Doctor's degree.

Courses for Undergraduate and Graduate Students

- 103s,su. Human Histology. A microscopic study of the various tissues and organs. Prerequisites: Anatomy 5-6, or equivalent. 9 credits. Mr. Scammon.
- 107s,su. Human Embryology. The development of the human body. Prerequisites: Anatomy 5-6, or equivalent. 6 credits. Mr. Scammon.
- 111f,su. Human Neurology. A study of the gross and microscopic structure of the central nervous system and sense organs of man. Prerequisites: Anatomy 103 and 107, or Animal Biology 9-10. 6 credits. Mr. Rasmussen.
- 112f,w,s. Comparative Neurology of Vertebrates. Prerequisites: Anatomy 111, or Animal Biology 27. Mr. Johnston.
- 121f,s. Anatomical Technique. Lectures and laboratory work upon the principles and practice of microtechnique. Prerequisites: Anatomy 103, or Animal Biology 9-10. 3 credits. Dr. Lee.
- 129f-130w-131s. Topographic Anatomy. Based upon a study of cross sections of the human body. Lectures and laboratory work. Prerequisites: Anatomy 5-6-7. 2 credits (or more) each quarter. Dr. Jackson.
- 133f,su. Anatomy of the Fetus and Child. A survey of prenatal and post-natal development. Fourth, fifth, or sixth year medical, or graduate students. Limited to sixteen students. Prerequisites: Courses 5-6-7, 107. 3 credits. Mr. Scammon.
- 134w. Anatomy of the New-Born. A detailed laboratory study of the anatomy of the new-born. Fourth, fifth, or sixth year medical, or graduate students. Prerequisites: Course 133, or equivalent. 3 credits. Mr. Scammon.
- 135f,su. Physical Development of Childhood. Lectures, with study of illustrative material. Primarily for students in the College of Education; open to medical or graduate students by permission of instructor. 2 credits. Mr. Scammon.
- 137f-138w-139s-140su. Implantation and Placentation. A study of the implantation of the ovum, the formation of the placenta, and the earliest stages of development in man and mammals. Prerequisites: Anatomy 102 or equivalent. 3 credits (or less). Dr. Lee.
- 149w. Experimental Neurology. A study of the morphology of the central nervous system by experimental methods. Prerequisites: Course 111. 3 credits (or more). Mr. Rasmussen.
- 153f-154w-155s-156su. Advanced Anatomy. Individual topics for advanced work in gross anatomy, histology, embryology, or neurology will be assigned to students who have completed the elementary courses in the corresponding subjects. Special courses are arranged for clinical gradu-

- ate students. Dr. Jackson, Mr. Johnston, Dr. Lee, Mr. Scammon, Mr. Rasmussen.
- 157f. Histology and Embryology of the Eye, Ear, Nose, and Throat. 3 credits. Mr. Scammon.
- 160f-162w-163su. Seminar in Growth of Children. A study with graphic analysis of data on physical development of children of school age. Prerequisites: Course 135, or equivalent. Hours and credits to be arranged. Mr. Scammon.

Courses Primarily for Graduate Students

- 201f-202w-203s-204su. Research in Anatomy. Qualified students may undertake the investigation of problems in anatomy, including histology, embryology, and neurology. Special facilities are offered to graduate students in the clinical departments for work upon problems in applied anatomy. Dr. Jackson, Mr. Johnston, Dr. Lee, Mr. Scammon, Mr. Rasmussen.
- 205f-206w-207s. Anatomical Seminar. Reviews of the current literature and discussion of research work being carried on in the department. Reading knowledge of French and German required. Dr. Jackson.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

As yet no facilities are provided for advanced work in anatomy in the Mayo Foundation. Mayo Foundation fellows desiring to take such work for one or more quarters may avail themselves of the opportunities at the Medical School.

Limited facilities for dissection under the supervision of Dr. Thomas Byrd Magath are provided in the Mayo Foundation for fellows who desire a general review of anatomy.

PHYSIOLOGY AND PHYSIOLOGIC CHEMISTRY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professors Elias P. Lyon, Ph.D., M.D., Jesse F. McClendon, Ph.D., Fred H. Scott, Ph.D., M.B., D.Sc.; Associate Professors Richard O. Beard, M.D., Chauncey J. V. Pettibone, Ph.D.; Assistant Professor Esther Greisheimer, Ph.D., M.D.; Instructor William W. Swanson, B.A., M.S.

The Department of Physiology is well equipped for the various types of physiologic investigation. The library facilities are good.

For a minor or major in physiology, good courses in general zoology, general chemistry, organic chemistry, and college physics, are prerequisites. Physical chemistry is desirable.

For a minor or major in physiologic chemistry, general chemistry and organic chemistry are prerequisite, and physical chemistry, quantitative chemistry, and biology are desirable.

In addition, each student majoring in physiology or physiologic chemistry must have had the general courses, Physiology 100, 101, 103, 104, or the equivalent.

Students majoring in clinical subjects, and who desire a minor in physiology or physiologic chemistry, must have had the courses in these branches usually required of medical students.

A reading knowledge of German or French is required of candidates for the Master's degree in this department, and reading knowledge of both French and German, of candidates for the Doctor's degree.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

- 100w,su-101s,su. Physiologic Chemistry. The components of the animal body; foods, digestion, the excreta, and metabolism. Prerequisite: organic chemistry. 198 hours; 12 credits. Dr. McClendon, Dr. Pettibone.
- 103f,su. Physiology of Muscle, Nerve, Blood, Circulation, and Digestion. Fourth year medical students and others. Prerequisites: organic chemistry and animal biology. 121 hours; 8 credits. Dr. Lyon, Dr. Scott, Dr. Greisheimer, and assistants.
- 104w,su. Physiology of the Nervous System and Special Senses; Respiration, Metabolism, Nutrition, and Excretion. Fourth year medical students and others. Prerequisites: organic chemistry and animal biology. 121 hours; 8 credits. Dr. Lyon, Dr. Scott, Dr. Greisheimer, and assistants.
- 108f. Seminar in Physiologic Optics. For graduate and medical students. 22 hours; 2 credits. Dr. Lyon.
- 110f. Physiologic Optics. A laboratory course. For graduate and medical students. 33 hours; 1 credit. Dr. Lyon.
- 113f,w,s,su. 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 readings. Prerequisites: Course 103-104 or equivalent. 66 hours; 3 credits or arrange. Dr. Lyon, Dr. Scott, Dr. Greisheimer.
- 115s. Applied Physiology. The application of physiology as a basis for interpretation of symptoms and signs of abnormal function. Three lectures weekly. 3 credits. Dr. Greisheimer.
- 131w. Advanced Physiology of Muscle, Blood, Circulation, and Digestion. Alterations due to physiologic conditions. Prerequisite: Physiology 103. 66 hours; 3 credits. Dr. Scott.
- 153f,w,s,su. Advanced Physiologic Chemistry. Course arranged by instructors with qualified students for special work. May be taken one or more quarters. Prerequisite: Course 100-101. Hours and credits arranged. Dr. McClendon, Dr. Pettibone.
- 155f. Physical Chemistry of Vital Phenomena. The application of electric conductivity; osmotic pressure; freezing points; hydrogen ion concentration; negative osmose; colloid chemistry and surface tension to physiological problems. Prerequisite: Course 100-101. 22 hours; 2 credits as lectures only. However, the student may take laboratory in addition under Course 153. Dr. McClendon.

- 162w. Chemical Analysis of Blood. The most recent methods in chemical analysis of blood. Limited to twelve students. Prerequisite: Physiology 101. 66 hours; 3 credits. Dr. Swenson.
- 163s. Metabolism. Lectures and laboratory work on special phases of metabolism. Lectures may be taken alone; number of students unlimited; laboratory course limited to ten students. Prerequisite: Physiology 101. 66 hours; 3 credits. Dr. Pettibone.
- 201f,w,s. Seminar in Physiology and Pharmacology. For instructors and advanced students. 11 hours; 1 credit. Dr. Hirschfelder, Dr. Lyon, and staff.
- 203f,w,s,su. Research in Physiology. Hours and credits arranged. Dr. Lyon, Dr. Scott, Dr. Greisheimer.
- 205f,w,s,su. Research in Physiologic Chemistry. Hours and credits arranged. Dr. McClendon, Dr. Pettibone.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Edward C. Kendall, Ph.D.

Most of the opportunities for graduate work in physiologic chemistry in the Mayo Foundation are in connection with the departments of Medicine, Pediatrics, and Clinical Pathology, for which see announcements under these several departments. In addition to these, advanced work is offered in the Department of Biochemistry to a limited number of well-prepared fellows.

- M251f,w,s,su. Physiologic Chemistry. Research work in problems related to metabolism; includes training in the use of methods of organic and inorganic analysis. Dr. Kendall, Mr. Osterberg.
- M263f,w,s,su. Medical Chemistry. Chemical and metabolic studies (in nephritis, acidosis, diseases of the liver and of the blood) together with research work along biochemical and metabolic lines. Dr. Rowntree, Dr. Keith. (See Department of Medicine.)
- M254f,w,s,su. Medical Chemistry. Chemical and metabolic studies in diabetes, together with research work along biochemical lines. Dr. Wilder. (See Department of Medicine.)
- M255f,w,s,su. In connection with various medical departments, special courses in biochemistry may be taken—(a) In the metabolic laboratory at the Kahler Hospital. (b) In the clinical chemical laboratories at the clinic. (c) In the medical laboratory at St. Mary's Hospital.

PHARMACOLOGY AND THERAPEUTICS

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Arthur D. Hirschfelder, B.S., M.D.; Associate Professor Edgar D. Brown, Phm.D., M.D.

The laboratories of the Department of Pharmacology are excellently equipped for the study of both the chemical properties of drugs and their actions upon the functions of the living organs and tissues. They are well equipped with chemical apparatus for the synthesis of new medicinal compounds, for studies upon the detection, isolation, and estimation of poisons

in toxicology and for the isolation of medicinal plant constituents. By the co-operation of the clinical departments, special studies may be made of the action of drugs, old and new, upon patients in the University and allied hospitals.

Opportunities are afforded for the special study of the actions of drugs which are used in each of the clinical specialties and the literature bearing upon them. As the needs of each graduate student are individual in this regard, these studies are taken up by conference, seminar, and experiments specially devised to meet each case.

- 101w. Introduction to Pharmacology. The principles underlying the structure, physicochemical properties, physiologic, therapeutic, and toxic action of substances, natural or synthetic, used as medicines. At least one quarter of physiology is prerequisite. 22 hours; 2 credits. Dr. Hirschfelder, Dr. Brown.
- 102s. General Pharmacology. A study of the most important drugs used in medicine with consideration of their chemical properties, actions on the normal and abnormal body, modes of administration, preparations, dosages, etc. 132 hours; 6 credits. Dr. Hirschfelder, Dr. Brown.
- 105su,w. General Pharmacology, in continuation. Lectures on narcotic, saporific, analgesic, antipyretic drugs, remedies used for the treatment of arthritides, etc. Writing of prescriptions for the drugs used. 33 hours; 3 credits. Dr. Hirschfelder, Dr. Brown.
- 105f. General Pharmacology, in continuation. Lectures on the salts of the metals, antiseptics, antisyphilitic drugs, chemotherapy, etc. 33 hours; 3 credits. Dr. Hirschfelder, Dr. Brown.
- 109f,w,s,su. Pharmacological Problems. Special investigations and experimental study of one or more of the following topics: anesthetics; circulatory stimulants and depressants; drugs acting upon the kidneys; urinary antiseptics; poisons and antidotes; effects of common harmless drugs; internal secretions; action of drugs upon parasites, tumors, etc. Hours and credits by arrangement. Dr. Hirschfelder, Dr. Brown.
- 110f,w,s. Poisons. Their detection, actions, and antidotes. 66 hours; 2 credits. 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.
- 204f,w,s. Advanced Pharmacology. With collateral readings. Limited to six advanced students. 11 hours; 1 credit. Time to be arranged. Dr. Hirschfelder, Dr. Brown.
- 205f,w,s. Chemical Pharmacology. Collateral reading and discussion of the relation of chemical structure to pharmacological action. Limited to four graduate students. 11 hours; 1 credit. Hour and registration to be arranged. Dr. Hirschfelder, Dr. Brown.

B. COURSES OFFERED IN THE MAYO FOUNDATION

All opportunities for advanced work in pharmacology and therapeutics offered in the Mayo Foundation are in connection with the departments of Medicine, Pediatrics, and Surgery. See announcements of these departments.

PATHOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Elexious T. Bell, B.S., M.D.; Assistant Professors Benjamin J. Clawson, M.D., M.A., Ph.D., James Shearer McCartney, M.D.; Instructor John Franklin Noble, M.D.

Graduate students who desire to take their major or minor work in pathology must present credit in the following subjects: physics, 8 credits; general and organic chemistry, 12 credits; zoology, 6 credits; and a reading knowledge of German and French.

In addition, students who elect their major work in pathology must present credits for the equivalent of the first two years' work of the Medical School of this University.

- 104f,w,s,su. Autopsies. The average number of post-mortems available is about 65 per month or about 800 per year. Graduate students take part in post-mortems, prepare post-mortem records, and make microscopic examination of various organs and tissues. The student may attend as many post-mortems as his other work allows.
- 106f,w,s,su. Pathologic Technique. In this course the students may learn to prepare frozen sections from fresh tissues or tissues fixed in formalin. Instruction is also given in methods of preparing paraffin sections. There is also opportunity to learn some special staining methods. Hours to be arranged.
- 107f,w,s,su. Applied Pathology. In this course the students may study the routine surgical specimens, of which about nine hundred a year are available. The material of the previous years is also available in the form of operation records and microscopic sections. Students who have access to surgical material from private hospitals in Minneapolis and St. Paul may prepare the clinical records of the case, and study the specimens grossly and microscopically under supervision. Hours to be arranged.
- 108f,w,s,su. Diagnosis of Tumors. In this course one two-hour period per week is devoted to the study of clinical cases which are discussed by the pathologist and the surgeon. Subsequent operative findings and the results of treatment are also reported. From four to eight clinical cases are demonstrated each period. One three-hour period per week is devoted to systematic laboratory work in the study of gross and microscopic preparations of tumors. Five hours per week. Dr. Bell, Dr. Cameron, Dr. McCartney.
- 109f,w,s,su. Clinical Pathologic Conference. The students are provided one week in advance with the clinical history of a case. The case is fully discussed clinically. The students are expected, in so far as possible,

- to predict the post-mortem findings from the clinical data. A full post-mortem report is then given, including the gross and microscopic demonstrations of the lesions that were found. Two hours per week. Staff of the Department of Pathology with Dr. Fahr or Dr. Cameron.
- 111s. Neuropathology. This course comprises a thoro study of the various lesions of the nervous system. One or two hours a week are devoted to lectures and recitations. The rest of the time is spent in the laboratory and lesions are studied both grossly and microscopically in connection with the clinical phenomena presented by the patients. Special emphasis is given to abnormal physiology. Six hours per week. Dr. J. C. McKinley.
- 112w. Pathology of Diseases of the Eye, Ear, Nose, and Throat. This course consists of lectures, demonstrations, and laboratory work on diseases of these special organs. A fair number of museum preparations is available. Three hours per week. Dr. W. E. Camp.
- 113f,w,s,su. Voluntary Assistantship in Pathology. Graduate students or undergraduates during the student internship period may receive credit for full time work in pathology. Such students devote their time to the study of post-mortem and operative material. They are required to attend as many post-mortems as possible. They may also act as voluntary teaching assistants if they wish.
- 115s. Histopathology of the Skin. This course consists of lectures and microscopic studies of the various skin diseases. Very few gross specimens are available but representative clinical cases are frequently brought over from the University dispensary. Dr. H. E. Michelson.
- 201f,w,s,su. Research. Graduate students, of the necessary preliminary training, may elect research, either as majors or minors in pathology. Hours and credits to be arranged.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professors Louis B. Wilson, M.D., Harold E. Robertson, B.A., M.D., D.Sc., William C. MacCarty, M.S., M.D., Frank C. Mann, M.A., M.D., Arthur H. Sanford, M.A., M.D.; Associate Professors Albert C. Broders, M.D., M.S. in Pathology, Thomas Byrd Magath, M.S., M.D., Ph.D.

Opportunities for advanced work in pathology are offered in five different sections in the Mayo Foundation, as follows:

1. Clinical Pathology. Dr. Sanford, Dr. Magath.

Work in this section includes diagnostic work in the laboratories of gastrology, urinalysis, serology, bacteriology, parasitology, and clinical chemistry. The total number of examinations in these laboratories in one year is considerably more than 200,000. Of this number about 35,000 are Wasserman tests. Graduate students in these clinical laboratories may learn the technique of accepted diagnostic procedures. Special attention is called to the opportunity for experience and research in serology under the direction of Dr. Sanford, and for training and research in parasitology under the direction of Dr. Magath. This work may be taken either as a major, or fulfilling the conditions of a minor.

For opportunities in bacteriology offered in the clinical laboratories see announcements of this department.

2. Pathologic Anatomy. Dr. Robertson.

Post-mortem examinations are made in sufficient numbers to provide active work for approximately ten fellows at a time.

The service is designed to permit the laying of a thoro foundation in the general principles of pathologic anatomy. Each fellow serves as junior assistant three months and senior assistant three months, during which time he takes part in the routine of post-mortem examinations and studies the microscopic sections of these post-mortems, and engages in weekly conferences and seminars concerned with general and special subjects in pathologic anatomy. Each fellow is expected to take up some special line of work upon which he reports to the group. Microscopic and gross demonstrations are held at frequent intervals and the work throughout is intimately supervised. Collateral reading and study are encouraged and oftentimes the foundation may be laid for thesis subjects or special lines of research. In connection with this work there is a well-organized museum for both display and study purposes. Fellows are aided and encouraged in the use of this museum to further their knowledge.

3. Surgical Pathology. Dr. MacCarty, Dr. Broders.

The laboratories of surgical pathology in St. Mary's, Colonial, Kahler, and Worrell hospitals receive immediately all tissue removed at operation. It is studied both grossly and microscopically. The minimum service in this work is six months, during which time opportunity is given to study a large amount of operative material. Besides the routine diagnostic work fellows are expected to begin to carry along in these laboratories some piece of pathologic research.

4. General Pathology. Dr. Wilson.

The work in this section consists entirely of individual research work. The minimum service in this section is six months.

5. Experimental Pathology. Dr. Mann.

Work in this section consists of research in problems of pathology involving the use of experimental animals.

M151f,w,s,su. Parasitology. Routine clinical and special research in parasitology, examination of stools, study of internal parasites. Dr. Magath.

M152f,w,s,su. Clinical Pathology. Making and examination of cultures, preparation and administration of autogenous vaccines, Wasserman tests, special clinical and laboratory methods including hematology and serology and opportunity for research. Dr. Sanford.

M153f,w,s,su. Laboratory Demonstration of clinical laboratory methods. Dr. Sanford, Dr. Magath.

M154f,w,s,su. Clinical Chemistry. Studies in the newer methods of blood chemistry. Dr. Sanford, Dr. Magath.

M155f-w,w-s,s-su,su-f. Necropsy Service. Junior assistant three months; senior assistant three months; demonstrations in clinico-pathologic conferences; microscopic examination of fixed tissues removed at necropsy and operations. Weekly seminar. Dr. Robertson.

- M156f,w,s,su. Laboratory Demonstration of tissue removed at necropsy and operation. Dr. Robertson.
- M157f-w,w-s,s-s-su,su-f. Surgical and Fresh Tissue Pathology. The diagnosis of surgical specimens (gross and microscopic) with immediate correlation with all clinical data. (Daily demonstrations and discussions.) Dr. MacCarty, Dr. Broders.
- M158f,w,s,su. Studies of Tumor Cells with Vital Stains. Dr. MacCarty, Dr. Broders.
- M251f,w,s,su. Research Studies in Special Pathology; special pathology of various organs; gross and microscopic study of lesions; research work on assigned problems in the several fields. Dr. Wilson.
- M252f,w,s,su. Cancer Research. Cytologic, histogenetic, and statistical. Dr. MacCarty, Dr. Broders.
- M253f,w,s,su. Research Studies upon clinico-pathologic standardization. Dr. MacCarty, Dr. Broders.
- M254f,w,s,su. Research Work on assigned problems in experimental pathology. Dr. Mann.
- M255f,w,s,su. Research Work in clinical pathology. Dr. Sanford, Dr. Magath.

BACTERIOLOGY AND IMMUNOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Winford P. Larson, M.D.; Associate Professor Arthur R. Henrici, M.D.; Assistant Professor Robert G. Green, B.S., M.D.

- 101f,su. Special Bacteriology for Medical Students. The study of pathogenic bacteria, especially in relation to definite diseases; bacteriological methods in clinical diagnosis; principles of infection and immunity, with practical application of serum reactions. Fourth year medical students and others. Prerequisite: general bacteriology. 66 hours; 4 credits. Dr. Larson and assistants.
- 105f. Food Bacteriology. The decay, fermentation, and putrefaction of foodstuffs; molds; canning; bacterial food-poisoning; bacteriology of the cleansing processes. Prerequisite: general bacteriology. 44 hours; 3 credits.
- 114s. The Higher Bacteria. Study of morphology, cultivation, and classification of actinomycetes, yeasts, and molds. Study of the mycoses. Prerequisites: general and special bacteriology. 44 hours; 3 credits. Dr. Henrici.
- 116w. Course in Immunity. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wasserman reaction. Opsonins. Vaccines. Precipitin reaction. Blood grouping. Abderhalden reaction. Anaphylaxis. Fifth and sixth year medical students. Limited to ten students. 44 hours; 3 credits. Dr. Larson.
- 117s. Pathogenic Protozoa. Study of parasitic Protozoa in men, including spirochaets; their morphology and life history; intermediate hosts as agents in the spread of disease; cultural methods. Prerequisites: general and special bacteriology; Animal Biology 45 and 107. 44 hours; 3 credits. Dr. Larson.

- 118f. Morphology and Taxonomy of Bacteria. Cytology of bacteria; their origin and systematic position; consideration of morphological, biochemical, and immunological characters as data for classification; variations and mutations in bacteria; the biometrical method as applied to bacteriology. Prerequisites: general and special bacteriology. 44 hours; 3 credits. Dr. Henrici.
- 119f. Bacteriological Chemistry. Microphysics of bacteria. Inorganic and organic constituents. Permeability of cells. Metabolism of bacteria. Enzymes of micro-organisms. Bacterial activity in the gastro-intestinal tract. Pigments. Prerequisites: general and special bacteriology; physiologic chemistry or phytochemistry. 66 hours; 4 credits. Dr. Green and assistant.
- 120w. 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. Dr. Green.
- 125w. Industrial Bacteriology. Bacteriology of foods, fermentations, enzyme production, commercial sterilization. Bacteria in chemical industries, manufacture of acetone, butyl, alcohol, acetic, lactic, and sulphuric acids, leather and sugar industries.
- 150f-151w (or 150w-151s). Advanced Bacteriology. An advanced course giving additional work in bacteriology and the opportunity of working out special problems. Limited to ten students. 44 hours; 3 credits. Dr. Larson, Dr. Henrici.
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.
203. Seminar in Bacteriology. One credit.
- 205s. Bacteriological Survey. A survey of original literature in bacteriology and related sciences. 3 credits. Dr. Larson, Dr. Henrici, Dr. Green.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professors Edward C. Rosenow, M.D., Arthur H. Sanford, M.A., M.D.; Associate Professor Thomas Byrd Magath, M.S., M.D., Ph.D.

Opportunities for the graduate study of bacteriology and immunology are in connection with routine clinical examinations and in special research. They are open to (a) graduate students holding only their baccalaureate or Master's degrees who have already had at least 176 clock hours of bacteriology but who have not had adequate preparation in pathology. Such students will not be permitted to attempt work involving a knowledge of pathology; (b) graduates in medicine or holders of Master's degrees who have had work both in bacteriology and pathology equivalent to that given in the medical course in the University. Such students will be given opportunity to do work in bacteriology involving pathologic relationships.

M151f,w,s,su. Clinical Bacteriology and Parasitology. Making and examination of cultures. Preparation and administration of autogenous

- vaccines. Wasserman tests; special laboratory methods in clinical bacteriology or parasitology. Dr. Sanford, Dr. Magath.
- M152f,w,s,su. Bacteriology of Necropsy Material. Collection of bacteriological material at necropsy under the supervision of a pathologist and its study in the laboratory under the supervision of a bacteriologist. Dr. Sanford, Dr. Magath, Dr. Robertson.¹
- M153f,w,s,su. Bacteriology of Surgical Material. Collection of bacteriological material from operative specimens under the supervision of a pathologist and its study in the laboratory under the supervision of a bacteriologist. Dr. Sanford, Dr. Magath, Dr. MacCarty,¹ Dr. Broders.¹
- M154f,w,s,su. Special Bacteriology of Medical Cases. A collection of bacteriological material in medical cases under the supervision of a physician and its study in the laboratory under the supervision of a bacteriologist. Dr. Sanford, Dr. Magath, Dr. Rowntree,² Dr. Keith.²
- M251f,w,s,su. Experimental Bacteriology. Research in the bacteriology of normal and diseased tissues, the blood, secretions and exudates. Experimental inoculation of animals and immunological studies. So far as possible work limited to study of pathogenesis and to development of specific methods of prevention and treatment of various diseases presumably of infective origin. Dr. Rosenow.

MEDICINE

(Including General Medicine, Dermatology, and Nervous and Mental Diseases)

The graduate work in the Department of Medicine is designed to offer opportunities for gifted men and women thoroly to prepare themselves for consultation practice, research and university teaching in the fields of internal medicine, dermatology or nervous and mental diseases. Prospective fellows who have had no special work, in addition to that of the ordinary undergraduate courses, in physiology, physiologic chemistry, bacteriology, therapeutics, experimental medicine, or pathology will usually find it advisable to devote a year or more to one or more of these subjects before entering the course. Applicants for fellowships with this special preparation in addition to the required year's internship will be given preference over those without it.

In addition it is expected that each fellow will continue work in one or more of these departments throughout his course, such work to count towards fulfillment of his requirements for a minor subject. Work in these departments may frequently be of research character, supplementing or being supplemented by clinical experience. For fellows specializing in nervous and mental diseases, work in anatomy and psychology is especially available as minor subjects. Work can also be arranged in the Department of Ophthalmology and Oto-Laryngology for fellows working in nervous

¹ See Department of Pathology.

² See Department of Medicine.

and mental diseases, thus giving special opportunity to study lesions of the eye occurring in systemic disorders.

That a better understanding may be obtained of the work available in the Department of Medicine it is described in its several sections of General Medicine, Dermatology, and Nervous and Mental Diseases.

GENERAL MEDICINE

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor S. Marx White, B.S., M.D., F.A.C.S. (Chief); Associate Professors George E. Fahr, B.S., M.D., Ernest T. F. Richards, M.D., C.M., John P. Schneider, M.D., Henry L. Ulrich, B.S., M.D.; Assistant Professors Moses Barron, B.S., M.D., Jay A. Myers, B.S., Ph.D., M.D.

The graduate work in internal medicine offered at the Medical School in Minneapolis affords an unusual opportunity to the student seeking preparation for the practice of the specialty, for research in the problems of medicine, and for teaching. The staff is especially selected for experience and capacity in teaching and investigation, and opportunity is given for contact with a large body of trained clinicians. The Minnesota General Hospital (University Hospitals), the Out-Patient Department, and the Minneapolis General Hospital afford a wide range of clinical material; and the laboratories of the fundamental branches of medicine provide an unusual opportunity for study and research in these fields so necessary in the training of the specialist in medicine.

Anatomy, including topographical anatomy, physiology, physiologic chemistry, pathology, bacteriology, immunology, and pharmacology have their laboratories and teaching centers on the campus, and the pursuit of one or more minor subjects to the extent required by the Graduate School may be carried on, particularly during the first year or two, alongside of, and in intimate relation to, the more definitely clinical studies. The large autopsy service of the Department of Pathology gives experience in this field and provides control of clinical diagnosis. Research work in one or more of the fundamental departments is carried on under the head of the department involved with the co-operation of the adviser in the Department of Medicine.

The more intensive clinical studies of the fellow are carried on in one or both of the hospitals mentioned, and in any case, the Out-Patient Department is utilized to the degree necessary for training of the fellow in the more active type of work to be seen later in practice and in teaching. Thus intensive scientific study is combined with active clinical experience. Independence of thought and of judgment concerning clinical problems is cultivated.

General rounds are conducted once a week in the hospital by the head of the department, and the reading of the fellow is supervised so that the broad field of medicine is covered and at the same time the special fields to which he may be attracted are thoroly cultivated. Clinics by faculty members, and many special lectures by invited guests, are available. The

requirement that a certain small amount of time be given by the fellow to teaching gives training in this art, essential to the accomplished clinician.

When the proper foundation is laid the fellow will find time, in addition to his clinical work, for research leading to his thesis, which may be purely clinical, or in a field combining clinical and laboratory study.

When he is sufficiently competent the fellow is eligible to appointment as resident in the hospital for one year with additional stipend, as is the case with fellows under the Mayo Foundation. In this position he acts as an officer of the clinic with definite duties and responsibilities in the care of patients in the University Hospital.

The fellow desiring special training in tuberculosis will find unusual opportunities in the Medical School and in the institutions close by, specializing in the care and treatment of this disease.

The courses listed below are described in the broadest outlines and for purposes of recording the character of the work done. No hard and fast program is contemplated, the individual capabilities, needs, and purposes of the fellow being given particular attention.

- 201f,w,s,su. Clinical Medicine. Study of general diagnosis and methods of investigation and recording clinical data. The laboratory of experimental medicine is open for study of special problems arising in the investigation of cases. Emphasis placed on methods of treatment. Dr. White, Dr. Fahr, Dr. Richards, Dr. Schneider.
- 202f,w,s,su. Diseases of Cardiovascular Apparatus. Special study of diseases of the heart and blood vessels, including technique and application of the polygraphs, electrocardiograph, and interpretation of outlines of the heart and great vessels obtained by means of the radiograms and orthodiagram. Dr. White, Dr. Fahr.
- 203f,w,s,su. Research in Medicine. University Hospital and Out-Patient Department. Dr. White, Dr. Fahr, Dr. Richards, Dr. Schneider.
- 204f,w,s,su. Problems in Medicine. Specific problems in diagnosis and treatment, including problems in immunology viewed from the clinical standpoint. General Hospital. Dr. Ulrich.
- 205f,w,s,su. Tuberculosis. Special opportunities in the study of problems relating to tuberculosis are afforded. Co-operation between the Medical School and various sanatoria specializing in tuberculosis is close, and problems may be studied, both the clinical and laboratory sides. An Out-Patient Department with rich material is available. Dr. Myers.
- 206f,w,s,su. Research in Mouth Infections. A study of dental and parodontal infections as related to systemic disease. Experimental study to determine the lesion produced in animals by bacteria from these sources. Dr. Hartzell.
- 209f,w,s,su. Neurologic Research. Dr. Hamilton.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professors Leonard G. Rowntree, M.D., D.Sc. (Chief), Henry S. Plummer, M.D., Arthur H. Sanford, M.A., M.D., Russell M. Wilder; Associate Professors Walter M. Boothby, M.A., M.D., George B. Euster-

man, M.D., Herbert Z. Giffin, B.S., M.D., Norman M. Keith, B.A., M.D., Willis S. Lemon, M.B., Archibald H. Logan, M.D.; Assistant Professors David M. Berkman, M.D., M.S. in Med., George E. Brown, M.D., Fred W. Gaarde, B.S., M.D., Dorr F. Hallenbeck, M.D., William A. Plummer, M.D., Lee W. Pollock, B.S., M.D., Leda J. Stacy, M.D., Fredrick A. Willius, M.D., M.S. in Med.; Instructors Arlie R. Barnes, M.A., M.D., Maurice B. Bonta, B.A., B.S., M.D., Louis A. Buie, B.A., M.D., Harry M. Conner, M.D., Carl H. Greene, Ph.D., M.D., Samuel F. Haines, B.S., M.D., Howard R. Hartman, B.S., M.D., William H. Long, M.D., Charles S. McVicar, M.D., Monte C. Piper, M.D., Irene Sandiford, Ph.D., Porter P. Vinson, B.S., B.A., M.D.

The clinical work in internal medicine in Rochester consists of diagnostic work on the floor of the clinic or in one of the hospital medical services, and includes history-taking, physical examinations, the recommendation of patients for special examinations with correlation of the results thereof, and the formation of independent judgments concerning diagnoses and indications and recommendations for medical and surgical treatment, all under the immediate direction of the head of the section and his associate or first assistant.

Each service consists of six days each week for one calendar year, except as noted, in a clinical section. There are ten general diagnostic sections in which the fellow may work in the clinic and six medical hospital services. The satisfactory completion of at least two services of one year each in these sections is required for recommendation for an advanced degree. When he is sufficiently competent in clinical work the fellow may be appointed to a first assistantship for a period of one year. This provides him with opportunities for informal teaching of junior men and with an additional stipend of \$1,000 a year, from the Mayo Clinic.

The Medical Department has recently been extended and has been furnished amply with medical beds—in the neighborhood of four to five hundred—in St. Mary's, Kahler, and Colonial hospitals. Laboratories have been established in St. Mary's and Kahler hospitals and equipped with ample facilities for the best type of routine medical practice and for medical research and investigation. Special services have been created for the intensive study of metabolic, cardiorenal vascular diseases, and diseases of the glands of internal secretion.

Most medical graduates are usually lacking in autopsy experience. Efficiency in this most essential field can be made up by a service of six months or more in the Section of Pathologic Anatomy. Such a service gives the fellow good experience in autopsy technic and diagnosis.

In graduate work in medicine the didactic lecture plays but a minor rôle. In the diagnostic clinic and hospitals much of the teaching is done through seminars, through ward rounds, and by contact between the professor and the fellow in the handling of the patients, or in the carrying out of laboratory procedures. In both clinical and hospital sections the fellow enters the section as an assistant and assists in the actual work of

these sections under the supervision of the head of the section and his associates.

Seminars are conducted in each section. In the clinical seminars cases of unusual interest are discussed and presented. In the hospital services additional seminars are conducted on special phases of medicine, on laboratory methods, on current medical literature, and pathologic conferences are conducted in cases coming to operation and necropsy. In these seminars the fellows themselves play an active rôle in presenting to the group cases or subjects which have been assigned to them by their chiefs.

In the laboratories fellows are given every opportunity to work out for themselves the problems of their choice or to participate in investigations being carried out by members of the staff.

Staff meetings are held weekly on Wednesday evenings and problems and cases of interest are presented and discussed. Foundation lectures are given five evenings a week by members of the staff or by invited lecturers.

As soon as he becomes oriented, each fellow is expected to find time, in addition to his clinical work, to begin and carry forward persistently some piece of research. While this may be purely clinical, in most instances it will be found to have relationships requiring detailed study in physiology, physiologic chemistry, pathology, or bacteriology.

Research work in special laboratory departments is done under the head of the department with the advice and counsel of the head of the clinical department in which the fellow is registered.

The usual fellow will find that approximately two thirds of his time should be devoted to diagnosis and treatment of disease, but provision is also made for the occasional fellow with unusual research ability who desires to devote his entire time, or the major part of it, to scientific investigation.

Tho the minimum time required for recommendation for the degree of master of science for work done in these fields is three years, it will usually be found that considerably more time is desirable and supplementary stipends are provided for men desiring to devote four or five years to the work.

M151f,w,s,su. Laboratory of Hematology and Urinalysis. Dr. Sanford.

M152f,w,s,su. Gastrological Laboratory. Dr. Sanford.

M153f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to diseases of the gastro-intestinal and accessory digestive tracts. Dr. Eusterman, Dr. Berkman, Dr. Hartman, Dr. McVicar.

M154f,w,s,su. Clinical Demonstration of diseases of the gastro-intestinal and accessory digestive tracts. 24 hours. Dr. Eusterman, Dr. Hartman, Dr. McVicar.

M155f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special references to diseases of the intestines. Dr. Logan, Dr. Pollock, Dr. Buie.

- M156f,w,s,su. Clinical Demonstration of diseases of the intestines. 24 hours. Dr. Logan, Dr. Pollock, Dr. Buie.
- M157f,w,s,su. Proctology. Dr. Logan, Dr. Pollock, Dr. Buie.
- M158f-w,w-s,s-su,f. General Medical and Surgical Diagnosis with special reference to diseases of the chest and esophagus. Dr. Lemon, Dr. Gaarde, Dr. Vinson.
- M159f,w,s,su. Clinical demonstration of diseases of the chest and esophagus. 48 hours. Dr. Lemon, Dr. Gaarde, Dr. Vinson.
- M160f-w,w-s,s-su,su-f. General Medical and Surgical diagnosis with special reference to diseases of the blood and blood-forming organs. Dr. Giffin, Dr. Bonta, Dr. Conner.
- M161f,w,s,su. Clinical Demonstration of diseases of the blood and blood-forming organs. 24 hours. Dr. Giffin, Dr. Bonta, Dr. Conner.
- M162f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to diseases of the cardiovascular system and ductless glands. Dr. H. S. Plummer, Dr. Boothby, Dr. W. A. Plummer, Dr. Willius, Dr. Barnes, Dr. Haines.
- M163f,w,s,su. Clinical Demonstration of diseases of the thyroid. 24 hours. Dr. H. S. Plummer, Dr. Boothby, Dr. W. A. Plummer, Dr. Willius, Dr. Barnes, Dr. Haines.
- M164f,w,s,su. Clinical Demonstration of diseases of the cardiovascular system. 24 hours. Dr. H. S. Plummer, Dr. Willius.
- M165f-w,w-s,s-su,su-f. Diagnosis and Research (clinical and laboratory) in cardiorenal and vascular and metabolic diseases. Dr. Rowntree, Dr. Wilder, Dr. Keith, Dr. Brown.
- M166f,w,s,su. Clinical demonstration of cardiorenal, vascular, and metabolic diseases. 24 hours. Dr. Rowntree, Dr. Keith, Dr. Brown.
- M167f,w,s,su. Clinical Demonstration of pancreatitis and diabetes. 24 hours. Dr. Wilder.
- M168f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to gynecology. Dr. Stacy.
- M169f,w,s,su. Radium Therapy. Dr. Stacy, Dr. Bowling.
- M170f,w,s,su. Roentgen Therapy. Dr. Des jardins.
- M171f-w,w-s,s-su,su-f. General Medical and Surgical Diagnosis with special reference to acute emergency conditions. Dr. Hallenbeck, Dr. Long, Dr. Piper.
- M251f,w,s,su. Advanced Work in Electrocardiographic Laboratory. Dr. H. S. Plummer, Dr. Willius.
- M252f,w,s,su. Metabolic Laboratory. Respiratory exchange and allied physiologic problems. Dr. Boothby, Miss Sandiford.
- M253f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M153. 12 hours. Dr. Eusterman, Dr. Hartman, Dr. McVicar.
- M254f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M156. 24 hours. Dr. Logan, Dr. Pollock, Dr. Buie.

- M255f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M158. 60 hours. Dr. Lemon, Dr. Gaarde, Dr. Vinson.
- M256f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M160. 12 hours. Dr. Giffin, Dr. Bonta, Dr. Conner.
- M257f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Courses M162, M251, or M252. 12 hours. Dr. H. S. Plummer, Dr. Boothby, Dr. W. A. Plummer, Dr. Willius, Dr. Barnes, Dr. Haines.
- M258f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M165. 12 hours. Dr. Rowntree, Dr. Wilder, Dr. Keith, Dr. Brown.
- M259f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M171. 12 hours. Dr. Hallenbeck, Dr. Long, Dr. Piper.
- M260f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M168. 12 hours. Dr. Stacy.
- M263f,w,s,su. Medical Chemistry. Chemical and metabolic studies (in nephritis, acidosis, diseases of the liver and of the blood) together with research work along biochemical and metabolic lines. Dr. Rowntree, Dr. Keith.
- M264f,w,s,su. Medical Chemistry. Chemical and metabolic studies in diabetes, together with research work along biochemical lines. Dr. Wilder.
- M265f,w,s,su. Research in Medicine. Dr. Rowntree, Dr. Wilder.

DERMATOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

No advance courses in dermatology are offered in the Medical School. Graduate students desiring this work will be given opportunity in the Mayo Foundation.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Assistant Professors W. H. Goeckerman, M.D., Paul A. O'Leary, M.D.

The Department of Dermatology of the Mayo Foundation offers excellent opportunities for the study of dermatology and syphilology. The service cares for about 5000 out-patients annually, of whom approximately 2000 have syphilis. The patients come to the section both direct and by refer from other departments. In the majority of cases they have been studied from every medical angle, so that the opportunity to master the relations and background of the specialty as well as its immediate diagnostic problems is unusually good. All the syphilis seen in the Mayo Clinic ultimately reaches this section, and provides a rich material for the study of every aspect of the disease. The in-patient service of the section includes a special hospital of 70 beds, with a treatment equipment through which pass from 20,000 to 25,000 patients per year. Approximately 10,000 arsphenamine injections and 3000 intraspinal injections are given

per year, and all such patients are retained under hospital care for at least 24 hours, which permits a full study and interpretation of their reactions and response to treatment. The section has a social worker who assists in the adjustment of the personal and social problems of patients, and directs the operation of the follow-up system. The department has special laboratories adapted to the prosecution of research problems and the general laboratories of the clinic and foundation are likewise available for this purpose.

The Department of Dermatology and Syphilology offers two types of graduate medical work.

1. *Short term service.*¹—Offered only to fellows in the Mayo Foundation, with preference to those majoring in internal medicine. This course consists of three to six months of training in clinical diagnosis especially as applied to syphilology but with due emphasis on dermatology. The fellows in this group see all entering patients of the department. They are systematically drilled in methods of examination, including the objective approach, the use of the dark field, and the making of smears, stains, and special preparations of the types essential in office diagnosis. The results of special examinations in other departments of the clinic are co-ordinated and the proper use of the X-ray, the eye examination, the spinal fluid examination, the provocative procedure, and so forth in the modern diagnosis of syphilis are impressed upon the student. The fellows follow the treatment of their patients on the hospital service of the section, learning under direction, the theory of the expert management of various phases of syphilis and of cutaneous disease. Special emphasis is placed throughout the dermatologic work upon the relation of dermatology to internal medicine both from the standpoint of diagnosis and treatment. By means of conferences, quizzes, and hospital rounds, the fellow is kept alert to all aspects of the subject.

No training in treatment technic is offered in connection with this service.

2. *Long term service.*—Fellows who take this course elect dermatology and syphilology as a major. Three years are devoted to the mastery of the specialty and to gaining the necessary groundwork in related branches, including serology, radiotherapy, neurologic diagnosis, and such elective courses as may seem called for in the individual case. The purpose of major work in dermatology and syphilology is the training of experts, able to attack intelligently any problem which cutaneous and syphilologic diagnosis and treatment may present, and to assume, if necessary, organizing and teaching responsibility. The fellow in dermatology and syphilology is trained in diagnosis by at least two years of constant contact with every aspect of cutaneous disease and syphilis in both out-patient (office) service and hospital. He is trained in teaching methods by an experience of 10,000 arsphenamine treatments of various types, 3000 to 5000 diagnostic spinal punctures, and 2000 to 3000 intraspinal treatments of various types, with the necessary amount of technical preparation in

¹ Limited to three fellows.

the simpler procedures such as intramuscular injection, etc. This is equivalent to approximately a year of treatment service. A full equipment for hydrotherapeutic work, ultra-violet light, high frequency and electrocoagulation, radium and X-ray therapy insures familiarity with the most advanced methods of dermatologic treatment.

Immediate contact with the patient while reaching a diagnosis and throughout the course of his treatment is insured by a period of hospital residence varying from six months to one year as house officer of the Dermatological Hospital, a service of 70 beds, with equipment for every refinement of dermato-syphilologic practice in a private clientele.

Training in the fundamentals of the pathology of syphilis and cutaneous disease is likewise an essential part of the equipment of the expert, and is accomplished by a laboratory and demonstration course.

Training in methods of investigation and research, and in the technic of preparing and publishing new material is given to the full-time fellow as a necessary part of his equipment. This training begins with the statistical study of clinical problems and in the preparation of a case report. It will be extended for fellows who are suitably equipped to include an investigation, with a laboratory phase in chemistry, serology, or immunology, which the fellow exploits as his special field over his own name and uses as a basis for his thesis. A Journal Club furnishes the necessary training in the searching and interpretation of the literature.

After the second year of service fellows in dermatology and syphilology who exhibit special proficiency and fitness may be appointed assistants in the section. This provides an increase of \$1000 per year in stipend over and above the fellowship remuneration. It makes possible the training of the fellowship man in the problems and responsibilities of consultant diagnosis, and permits his participation in teaching work. During an assistantship, the incumbent is expected to prepare and deliver a course of lectures under the supervision of the head of the department upon the history and recent developments in some important aspect of the specialty.

Discipline in executive responsibility and instruction in the problems of departmental administration are available for those who exhibit special aptitude and who are likely to be called upon to undertake organizing duties.

While full time fellowship standing in the Department of Dermatology and Syphilology is limited to those who carry the work as a major for three years, the department is prepared to consider as applicants for one or two years of service, those who, because of previous graduate medical work in the specialty, may be regarded as already partially equipped to meet the ultimate standards of the department. No application for less than one year of service will be considered, and no "brushing up" courses for practitioners are offered.

M172f,w,s,su. General Diagnosis with special reference to dermatology and syphilology. All day. Dr. Goeckerman, Dr. O'Leary.

M173f,w,s,su. Clinical Demonstration of Dermatologic and Syphilologic Material. 24 hours. Dr. Goeckerman, Dr. O'Leary.

M261f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M172. 24 hours. Dr. Goeckerman, Dr. O'Leary.

NERVOUS AND MENTAL DISEASES

For students specializing in nervous and mental diseases, minors in anatomy, physiology, and psychology are especially valuable, and for those desiring it, work could be arranged in the Department of Ophthalmology and Oto-Laryngology, giving a special opportunity to study lesions of the eye occurring in systemic disorders.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Arthur S. Hamilton, B.S., M.D.; Associate Professor Ernest M. Hammes, M.D.; Assistant Professor J. Charnley McKinley, M.A., M.D., Ph.D. in Neurology.

For fellows in general medicine opportunity is given for the study of clinical neurology in the hospital and in the Out-Patient Department. For fellows specializing in nervous and mental diseases there are unexcelled facilities for the study of the anatomy, physiology, and pathology of the nervous system, and fellows are given an opportunity to teach in these fields. In addition to the work in the University Hospital and Out-Patient Department, the student has access to the Minneapolis General Hospital, the St. Paul City and County Hospital, and to the laboratories of the Department of Psychology of the University, as well as to the Child Guidance Clinic established in Minneapolis under the auspices of the National Committee for Mental Hygiene.

The close relation between the division of nervous and mental diseases and the department of eye, ear, nose, and throat gives an opportunity for study under trained specialists of the special senses in their relation to diseases of the nervous system.

The clinics in general medicine and special lectures at the University by invited guests are freely open to the student.

207f,w,s. Pathology of the Nervous System. The preparation of gross and microscopic material from diseased nerve tissues; the relations existing between pathologic lesions, signs, and symptoms; the chief neuron systems and principles underlying their degeneration. Dr. Hamilton.

208f,w,s,su. Clinical Neurology. Advanced diagnosis of nervous diseases; practical experience in diagnostic procedures employed in the study of diseases of the nervous system. Dr. Hamilton.

209f,w,s,su. Neurologic Research. Dr. Hamilton.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Professor Walter D. Sheldon, B.S., M.D.; Associate Professor Henry W. Woltmann, B.S., M.D., Ph.D. in Neurology; Instructors John B. Doyle, M.D., M.S. in Neurology, Harry Lee Parker, M.B., M.S. in Neurology.

A practical clinical course for fellows in general medicine and neurology is conducted for periods of six months or longer. This includes a daily conference on cases of special diagnostic importance, a weekly conference for the review of current neurologic literature, and a monthly clinical pathological conference for the study of autopsy material. For fellows majoring in neurology special work in neuropathology is offered. Considerable opportunity for psychiatry is offered and weekly visits are made to the Rochester State Hospital for the Insane.

This department is closely associated with the departments of the eye, ear, nose, and throat, and with various laboratories for the study of neurology as a specialty and its relationship to general medicine.

M174f-w,w-s,s-su-f. General Diagnosis in Neurology and Psychiatry.

Dr. Shelden, Dr. Woltmann, Dr. Moersch, Dr. Doyle, Dr. Parker.

M175f,w,s su. Clinical Demonstration of Neurological Diseases. 24 hours.

Dr. Shelden, Dr. Woltmann, Dr. Moersch, Dr. Doyle, Dr. Parker.

M261f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M174. 12 hours. Dr. Shelden, Dr. Woltmann,

Dr. Moersch, Dr. Doyle, Dr. Parker.

M262f,w,s,su. Neuropathology. Open to fellows who are majoring in neurology and who have had adequate preparation in general pathology.

Dr. Woltmann.

PEDIATRICS

The graduate work of the Department of Pediatrics is arranged with the intention (a) of preparing students to become competent pediatricists; (b) to put them in position to attack original pediatric problems; and (c) to make them competent teachers in the subject.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Frederic W. Schlutz, M.D., Chief; Associate Professors Walter R. Ramsey, M.D., Frederick C. Rodda, M.D.; Assistant Professors Edgar J. Huenekins, B.A., M.D., Max Seham, M.D., Rood Taylor, M.D., Ph.D. in Pediatrics; Instructor Naboth O. Pearce, M.D., M.S.

The work of the department is conducted in the wards and Out-Patient Department of the University Hospital, the Minneapolis General Hospital, and Lymanhurst in Minneapolis, the Ancker and Miller hospitals and the Out-Patient Department of the Wilder Charities in St. Paul. The Child Welfare organizations, the Child Guidance Clinic and special arrangements with the Board of Education afford excellent opportunities of all phases of preventive pediatrics.

The general library of the University, an unusually complete departmental library, and complete files of all journals dealing with pediatrics furnish adequate reference facilities.

Research laboratories attached to the Department of Pediatrics and the large general laboratory attached to the departments of Physiology,

Anatomy, Bacteriology, and Pharmacology are at the disposal of the graduate students, and afford every possible opportunity for research.

As a prerequisite a general understanding of physiologic (physical) and analytic chemistry and a working knowledge of French and German are essential.

Prospective students will find preparatory study in physiology and quantitative analysis of value.

Students will be encouraged to carry a minor in some of the fundamental branches.

The following electives in other departments are desirable. (For further information see description of courses under departmental headings.)

- Quantitative Analysis
 - Organic Chemistry
 - Physical Chemistry
 - Mental Retardation
 - Physiologic Chemistry
 - Physiology of Muscle, Nerve, Blood, Circulation, and Digestion
 - Physiology of the Nervous System and Special Senses: Respiration, Metabolism, Nutrition, and Excretion
 - Physical Chemistry of Cells
 - Electrophysiology
 - Metabolism
 - Quantitative Methods
 - Human Neurology
 - Fetal Anatomy
 - General Roentgenologic Technique
 - Interpretations of Roentgenologic Findings
 - Hematology
 - Course in Immunity
 - The Physiological and Chemical Basis of Pharmacology (Pharmacology 113)
 - Diseases of Cardiovascular Apparatus (Medicine 123-124)
 - Medical Chemistry
 - Orthopedic Service
 - Orthopedic Diagnosis
 - Advanced Ophthalmoscopy
- 103f,w,s,su. Clinic in Pediatrics. Conducted at the University Hospital and the General Hospital; a part of course in required clinics.
- 104f,w,s,su. Contagious Diseases. The advanced study of contagious diseases, including the practice of intubation and tracheotomy, with training upon the cadaver.
- 111f,w,s,su. Diseases of the New-Born.
- 115f,w,s,su. Theory and Practice of Infant-Feeding, including diseases of the gastro-intestinal tract.
- 117f,w,s,su. Pediatric Clinic. Out-Patient Clinic; University Hospital.

- 125f,w,s,su. Special Graduate Contagious Course. Advanced study of contagious diseases, including practice of intubation with training upon the cadaver and the living dog. Limited to graduates.
- 127f,w,s,su. Thesis Course.
- 129f,w,s,su. Pediatrics Seminar.
- 130f,w,s,su. Course consisting of three to twelve months' residence in pediatrics and contagious diseases at General Hospital.
- 142f,w,s,su. Preparation of Infant Foods. Practical work.
- 144f,w,s,su. Contagious Diseases. Advanced study of contagious diseases.
- 200f,w,s,su. Advanced Study of Diseases of Infants and Children.
- 202f,w,s,su. Research in Diseases of New-Born. Students undertaking this work should have had the equivalent of Fetal Anatomy and Pediatrics III.
- 204f,w,s,su. Research in Physiology of New-Born. Prerequisite: Pediatrics III. Prerequisite preparation in physiology will depend upon the type of work undertaken.
- 206f,w,s,su. Research in Diseases of Infants and Growing Children. Prerequisite work will depend upon the type of work undertaken.
- 208f,w,s,su. Research in Physiology of Infants and Growing Children. Prerequisite preparation will depend upon the type of work undertaken.
- 210f,w,s,su. Research in Anatomy of Infants and Growing Children. Prerequisite preparation will depend upon the type of work undertaken.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Henry F. Helmholtz, B.S., M.D.; Associate Professor Samuel Amberg, M.D.

The opportunities offered in pediatrics in the Mayo Foundation are designed for the purpose of training a few selected men for the special practice of pediatrics. The courses are also valuable to fellows majoring in special clinical fields.

The work of the department comprises:

a. The care of the new-born.

Immediately after the birth of the infant the Pediatrics Department assumes charge.

b. The Pediatrics Department is practically in charge of the work in preventive pediatrics in the City of Rochester and in Olmsted County, co-operating with the City Health Department and the Olmsted County Public Health Association. This work comprises infant welfare work as well as the care of the child of pre-school and school age.

c. A special advantage lies in the large number of cases presenting unusual manifestations of common diseases, as well as those conditions which are not so frequently seen in the ordinary hospital and out-patient departments.

d. The work in the city affords a chance for routine practice in pediatrics, including the usual infectious diseases.

e. The department has a service of its own at St. Mary's Hospital. In addition it has the supervision of all children below the age of fourteen

years in the other hospitals. The Pediatrics Department co-operates with the surgical section in the pre-operative and post-operative management of the patients.

f. Research is regarded as an important feature of the graduate work, and there are ample clinical and laboratory facilities for investigative study.

M151f-w,w-s,s-su-su-f. Diagnosis of Medical and Surgical Diseases of Infancy and Childhood. Dr. Helmholz, Dr. Amberg.

M152f,w,s,su. Clinical Demonstration of diseases of infancy and childhood. 24 hours. Dr. Helmholz, Dr. Amberg.

M153f-w,w-s,s-su-su-f. Preventive Pediatrics. 24 hours. Limited to two fellows. Dr. Helmholz, Dr. Amberg.

M251f,w,s,su. Seminar. Open to fellows who have been or who now are enrolled in Course M151. Dr. Helmholz, Dr. Amberg.

M252f-w,w-s,s-su-su-f. Research in Diseases of Infancy and Childhood. Dr. Helmholz, Dr. Amberg.

SURGERY

(Including divisions of General Surgery, Experimental Surgery, Orthopedic Surgery, Urology, and Dental Surgery)

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Arthur C. Strachauer, M.D., F.A.C.S. (Chief); Associate Professors J. Frank Corbett, M.D., F.A.C.S., Emil S. Geist, M.D., F.A.C.S., Arthur A. Law, M.D., F.A.C.S., William Lerche, M.D., F.A.C.S., Arthur T. Mann, B.S., M.D., F.A.C.S., Franklin R. Wright, D.D.S., M.D., F.A.C.S.; Assistant Professors Angus L. Cameron, M.S., M.D., Ph.D. in Surgery, Carl C. Chatterton, M.D., F.A.C.S., Gilbert J. Thomas, M.D.

Graduate work in surgery at the Medical School is designed to offer superior training to a limited number of fellows in three or more years of residence. The practical and scientific aspects of a well-rounded surgical course are equally emphasized.

The prospective fellow must be able to qualify as a candidate for the Ph.D. degree so far as his preliminary education is concerned. (See requirements for higher degrees.)

The fundamental laboratories of the Medical School offer numerous graduate courses closely related to surgery. (See statements of Anatomy, Pathology, Physiology, and Physiologic Chemistry, Bacteriology.) Opportunity for special investigative and research work is found in these departments. The minor subjects must be taken in one of the above departments; anatomy or pathology is usually selected by the fellow. The proximity of the medical buildings and arrangement of courses afford opportunity for co-ordination of clinical and laboratory work which is highly desirable.

The courses offered by the Department of Surgery consist of animal, experimental, and cadaver surgery, together with work in the hospital and out-patient departments in surgical diagnosis, operative surgery, and some of the surgical specialties, particularly urology and roentgenology.

Unexcelled opportunities for technical and experimental work under aseptic conditions comparable to a first-class operating room are offered in the laboratories of animal and experimental surgery. In these laboratories the fellow conducts his investigative work for his thesis.

The fellow assists in the instruction of undergraduate senior students in cadaver surgery and applied anatomy. These courses are repeated three times each year. This repetition is to the great advantage of the fellow. Clinical instruction is given throughout the entire fellowship period.

The University Hospital fellowship provides a house surgeonship in the University Hospital, with or without residence. The fellow aids the surgical staff in diagnosis and in the pre-operative and post-operative care of patients. He helps to direct and supervise the work of the internes, and after his first year assists in the bedside teaching of the surgical clerks. He acts as first assistant in operations performed by the general surgical staff. As soon as he proves himself capable, the more simple major operations are delegated to him to perform, with the surgeon acting as first assistant. Later, he is permitted to operate under the supervision of the surgeon, and finally, when he has demonstrated his ability, he operates independently. Increasingly difficult cases are assigned as his ability warrants. Supervision is always given until the staff surgeon is satisfied of the fellow's ability to perform independently any stated operation.

A Medical School surgical fellowship is also offered with assignment and residence at the Minneapolis General Hospital, which has a total of 679 beds.

By courtesy of and arrangement with the Mayo Foundation the second year of both of these fellowships may be spent in residence at Rochester, where exceptional opportunities for general and special diagnostic and operating room services are available.

The General Memorial Cancer Hospital of eighty beds, in process of construction, with complete operating, X-ray, and radium equipment will greatly enhance the opportunities for general surgical training at the Medical School.

A six months' special training in urology is offered to all graduate students. The student acts, for a limited period, as first assistant on this service, where he is taught the various diagnostic methods including cystoscopy and the allied procedures. Assisting and independent operating in this field are also provided.

Regular graduate students who are not fellows are offered combined courses leading to qualification for advanced degrees. The University Hospital fellowships are limited to candidates for the Ph.D. degree.

101f,w,s. Advanced Minor Surgery. The student is required to assist in the out-patient surgical clinic, and in this connection makes a special study of the diagnosis and treatment of selected cases. Dr. Strachauer.

- 102f,w,s. Operative Surgery on the Cadaver. Technique of abdominal incision and closure; of bowel suturing, appendix removal, kidney exploration, nephrotomy, tracheotomy, amputations, ligations, etc. Graduate students act as laboratory assistants, and may work out upon the cadaver various independent problems in emergency surgery. Dr. Cameron.
- 103f,w,s. Operative Surgical Technique. A study of surgical technique by cardinal operations upon living animals. Dr. Cameron.
- 105f,w,s. Proctoscopy and Sigmoidoscopy. The treatment and diagnosis of the pathological conditions found in the lower bowel, including minor surgical operations. Dr. Strachauer.
- 201w,s. Surgery of the Kidney. Review of the embryology, anatomy, and pathology. Diagnosis, cystoscopic study, including kidney function estimation and pyelography; operative technique. Study of special problems involved. Dr. Strachauer, Dr. Thomas.
- 204w,s. Surgery of the Brain and Spinal Cord. Operative technique; study of special problems involved. Prerequisites: Anatomy 103, Medicine 125. Dr. Strachauer.
- 205f-206w-207s. Surgical Diagnosis. In this course the graduate student assists in the practical instruction of the clinical clerks and internes in the University Hospital, and makes a special study of problems in surgical diagnosis. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 208f-209w-210s. Surgical Service. The graduate student acts as house surgeon, and in connection with the service is required to make a special study of the patients, preparing them for clinics and observing them after operations. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 211f-212w-213s. Operative Surgery. In this course the surgical fellow acts as first assistant at all operations by the surgical staff in the University Hospital. When properly qualified, the fellow will be permitted to operate, beginning with simpler surgical procedures. Dr. Strachauer, Dr. Law, Dr. Ritchie.
- 216f,w,s. Surgical Research. Properly qualified students may undertake original investigation of problems in either experimental or clinical surgery. The work may be used for thesis purposes. Dr. Strachauer, Dr. Cameron.
- 217f,w,s. Surgical Seminar. Conference for reports on surgical literature, with presentation and discussion of specially interesting cases and research work by members of the surgical staff. Dr. Strachauer, Dr. Cameron.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professors Donald C. Balfour, M.D. (Chief); E. Starr Judd, M.D., Frank C. Mann, M.A., M.D., Charles H. Mayo, M.A., LL.D., M.D., D.Sc., F.A.C.S.; Associate Professor Walter E. Sistrunk, Ph.M.C., M.D.; Assistant Professors Alfred W. Adson, M.D., M.S. in Surgery, Verne C. Hunt, B.S., M.D., M.S. in Surgery, James C. Masson, M.D., John de J. Pemberton, B.A., M.D., M.S. in Surgery; Instructors Stuart W.

Harrington, M.D., M.S. in Surgery, Fred L. Smith, M.D., Waltman Walters, M.D., M.S. in Surgery.

Dr. William J. Mayo, being a regent of the University, is not a member of the instructional staff. His services in instruction and conference, however, are available.

The opportunities for preparation in surgery in the Mayo Foundation are principally in the field of surgical pathology, in general and surgical diagnosis and in operative and experimental surgery. For work in pathology see the Department of Pathology. For work in surgical diagnosis see the Department of Medicine.

Fellows majoring in surgery usually select pathology as their minor. This the faculty recommends tho a minor may be taken in any other supporting preclinical field.

Men majoring in surgery usually begin their work with three or six months in post-operative care of ambulatory patients; with six months in pathologic anatomy; with six months in surgical pathology; or with a year's work in general diagnosis. This general diagnostic work is divided into two services of six months each. Anyone desiring more diagnostic work may take an additional half year. Fellows select the diagnostic sections in which they desire to work and their requests are followed so far as arrangements of the schedule will permit. The work in the minor field, pathology, anatomy, or physiology, and at least one year of diagnostic work should be completed before the fellow begins his operative service, at the Colonial, Kahler, or St. Mary's Hospital.

Operating room service for fellows in general surgery is given at St. Mary's, Kahler, and Colonial hospitals. The Kahler Hospital of 150 beds is at present utilized for the observation and surgical treatment of goiter, under the direction of Dr. Plummer, Dr. Pemberton, and Dr. Sistrunk. A limited amount of general surgery is also done in this hospital. Fellows on this service are charged with the pre-operative and post-operative care of the patients and act as second assistants in the operating room.

The Colonial Hospital of 325 beds is utilized for general surgery, including practically all the emergency surgery, and a large part of the surgery of certain specialties: neurology (Dr. Adson), the thorax (Dr. Harrington), orthopedics (Dr. Henderson and Dr. Meyerding), and urology (Dr. Hunt). During the fellow's service at the Colonial he acts as second assistant in the operating rooms and may have an opportunity of acting as first assistant.

St. Mary's Hospital contains 600 beds, 400 of which are available for general surgery. During the fellow's service in this hospital he works in various rooms as second assistant, and may have opportunity of acting as first assistant.

In their operative service fellows act as second assistants for a period of six months to one year. The service also includes post-operative care of all patients in the operating room in which the fellow is on service.

During this service the fellow works in various rooms as second assistant and has occasional opportunity to act as first assistant. All second assistants are resident in the hospitals in which they are on operative service.

Fellows who are considered best qualified are appointed first assistants for a period of one or two years. This service may begin during the third year of residence. There are ten such first assistantships available. There are also three positions as house surgeon open to competent fellows. House surgeons act as alternate first assistants.

Besides the work already mentioned opportunities are offered for work in urology, roentgenologic diagnosis, orthopedics, neurology, maxillofacial surgery, animal experimentation, X-ray and radium therapy, and regional anesthesia.

It will thus be seen that fellows in surgery may find it desirable to remain for longer than the minimum of three years. Recently the average residence is about four years, tho this is not required.

M152f,w,s,su. Post-operative Care of Patients; treatment of complications, surgical and medical. Dr. Sistrunk, Dr. Smith.

M153f-w,w-s,s-su,su-f. Operative Surgery. Second assistantship in operating rooms; occasional substitute service as first assistant. Dr. Mayo, Dr. Judd, Dr. Balfour, Dr. Sistrunk, Dr. Hunt, Dr. Masson, Dr. Pemberton, Dr. Adson, Dr. Harrington.

M154f,w,s,su. Surgery of the Abdominal Organs and the Ductless Glands. Operative technic; study of special problems involved. Dr. Mayo.

M155f,w,s,su. Surgery of the Abdominal and Genito-Urinary Organs. Operative technic; study of special problems involved. Dr. Judd.

M156f,w,s,su. Surgery of the Gastro-Intestinal Tract and Pelvic Organs. Operative technic; study of special surgical problems. Dr. Balfour.

M157f,w,s,su. Surgery of the Thoracic Organs. Operative technic; study of special problems involved. Dr. Harrington.

M158f,w,s,su. Surgery of the Central Nervous System. Operative technic and study of special problems involved. Dr. Adson.

M159f,w,s,su. Intravenous Medication. The work in intravenous therapy offers a large field for the study of problems related to blood physiology, the blood dyscrasias and the causes and prevention of reactions following such therapy. Dr. Pemberton.

M160f,w,s,su. Regional Anesthesia. The technic of field block and nerve block procedures will first be practiced upon the cadaver while the student observes the performance of the work on patients. During the latter half of the term opportunity will be provided for the student himself to perform these anesthetic procedures as part of the pre-operative preparation on patients at St. Mary's, Colonial, and Kahler hospitals. Dr. Balfour.

M161f,w,s,su. Surgical Technic. The purpose of this course is to develop surgical technic. The fellows are paired and one operates while the other assists in performing the classical operations adaptable to experimental surgery. Two afternoons per week each quarter. Open only to fellows in surgery. Dr. Mann.

- M249f,w,s,su. Research work on assigned problems in experimental physiology. Dr. Mann.
- M250f,w,s,su. Applied Physiology. Demonstrations of physiological procedures and processes which are of value in relation to clinical medicine. Dr. Mann.
- M251f,w,s,su. Applied Pathology. Demonstrations of pathological procedures and processes which are of value in relation to clinical medicine. Dr. Mann.
- M252f,w,s,su. Surgical Research. Investigation of special problems in surgery. Open only to fellows of the department. Dr. Mann.
- M253f,w,s,su. Research work on assigned problems in experimental pathology. Dr. Mann.
- M254f,w,s,su. Surgical Seminar. Conference for the discussion of original work, problems, and surgical literature. Staff.

ORTHOPEDIC SURGERY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Associate Professor Emil S. Geist, M.D., F.A.C.S.; Assistant Professor Carl C. Chatterton, M.D., F.A.C.S.

- 214f,w,s. Orthopedic Service. Three months' service as house surgeon in the State Hospital for Crippled and Deformed Children at Phalen Park. Special facilities for the study of orthopedic diagnosis and treatment. Dr. Chatterton.
- 215f,w,s. Orthopedic Diagnosis and Treatment. History-taking, physical examination, treatment, application and use of plaster of Paris casts and braces. The graduate student acts as assistant in the clinic. Dr. Geist.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Melvin S. Henderson, M.D., F.A.C.S.; Associate Professor Henry W. Meyerding, M.D., M.S. in Orthopedic Surgery, F.A.C.S.

Orthopedic surgery in the Mayo Foundation embraces not only the deformities of childhood but practically all deformities of the extremities and the spine in the adult. Fractures, recent and old; osteomyelitis, acute and chronic; bone tumors, cervical ribs, and so forth, that usually are relegated to general surgery are taken care of in the orthopedic service. In addition all the usual congenital deformities, such as club feet, dislocated hips, torticollis, and so forth are seen on this service. The surgeon who is to successfully cope with such a broad field of surgery must have a sound general surgical training. On account of the breadth of this service and the close association with general surgery as it is ordinarily understood, five places are held for fellows in general surgery. These include the position of house officer at St. Mary's Hospital where a service of thirty-five beds is maintained and a like position at the Colonial Hospital where a service of fifty beds is maintained. Here the hospital care of orthopedic patients is carried on. All emergency cases such as recent and compound fractures, acute osteomyelitis, etc. are also taken care of. The

remaining three services for general surgery are confined to orthopedic diagnosis, treatment of non-operative patients, manufacture and fitting of braces and out-patient and post-operative service. Careful history-taking and complete general examinations are done on all patients.

Two three-year services are available for fellows showing special adaptability for orthopedic surgery. Such fellows will have one year in diagnosis, at least one year in orthopedic surgery, one year in general surgery, and a minor either in pathology, anatomy, or neurology. Ample opportunity will be given the men majoring in orthopedic surgery for first assistantship in the operating room and in the office.

In connection with the examining rooms at the clinic is a brace shop and special shoe shop where braces and shoes are made. Thus ample opportunity is given for the study of the manufacture and use of orthopedic appliances. A department of physiotherapy is equipped and maintained also in connection with the section, so that gymnastics and exercises can be given and the post-operative care can be followed to completion. If a fellow has a problem that demands experimental work in its study, special time off can be arranged so that it can be carried out properly under the direction of the head of the experimental laboratory.

M162f,w,s,su. Orthopedic Diagnosis. History-taking and physical examination of orthopedic cases. Study of braces, material and construction, measurements and fitting; application and use of plaster of Paris; interpretation of radiograms of orthopedic cases; care of non-surgical and post-operative cases. Dr. Henderson, Dr. Meyerding.

M163f,w,s,su. Orthopedic Surgery. One year in service is offered to fellows majoring in orthopedic surgery. Dr. Henderson, Dr. Meyerding.

M164f,w,s,su. Demonstration of Orthopedic Cases. 24 hours. Dr. Henderson, Dr. Meyerding.

M255f,w,s,su. Seminar in Orthopedic Surgery. Open to fellows of the department. 12 hours. Dr. Henderson.

UROLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Associate Professor Franklin R. Wright, D.D.S., M.D., F.A.C.S.; Assistant Professor Gilbert J. Thomas, M.D.

218f,w,s. Urologic Diagnosis. History-taking, physical examination, and case study in diseases of the genito-urinary tract. Dr. Wright, Dr. Thomas.

219f,w,s. Cystoscopy and Urethroscopy. Cystoscopic examination; urethral catheterization; kidney function study; pyelography; intravesical operations; fulguration. Dr. Wright, Dr. Thomas.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor William F. Braasch, B.S., M.D.; Associate Professor John L. Crenshaw, M.D.; Assistant Professor H. Carey Bumpus, Jr., Ph.B., M.D., M.S. in Urology; Instructor William H. Von Lackum, B.S., M.D.

Opportunity for graduate instruction in urology is offered as a major and as a minor course. Two appointments are made annually in each course. Those fellows having had advanced work in the fundamental sciences or who are otherwise unusually well qualified will be given preference.

The major course in urology extends over a period of three years, which includes one and one-half years devoted to the diagnosis and treatment of diseases involving the urinary tract in the Section of Urology, one year in operative surgery, and the remaining six months in pathology. The course is designed to provide a thoro experience in the diagnosis and treatment of diseases involving the urinary tract. Opportunity is given to spend additional time in the study of the anatomy and physiology of the urinary tract, and in experimental work.

Urologic diagnosis and treatment, including cystoscopy, urethroscopy, urography, fulguration, diathermy, removal of foreign bodies, lithotripsy, ureteral manipulation, pelvic lavage, radium treatment, and so forth, are conducted daily in the cystoscopic rooms on the second floor of the Kahler. A suite of ten rooms in the south wing of the Kahler is devoted to this purpose. These rooms have been equipped with the latest devices for urologic diagnosis and treatment. They also include a special urologic laboratory and library. The technical work is carried on during the mornings under the supervision of Dr. W. F. Braasch, Dr. J. L. Crenshaw, and Dr. H. C. Bumpus. The fellow is given an opportunity personally to examine patients and familiarize himself with the diagnosis of a wide range of diseases affecting the urinary tract. More than six thousand cystoscopic examinations have been made in these rooms annually in recent years. Of this number a comparatively small percentage were negative cases, and the pathology involved was largely of a surgical nature. The afternoon is devoted to history-taking and physical examinations of patients suffering from diseases of the urinary tract and allied conditions, in the examining rooms of the Mayo Clinic. The close relation of this work to general diagnosis broadens the field and affords the fellow a breadth of clinical vision which he might not otherwise have. This service extends over a period of twelve months, which is divided into junior and senior services.

The diagnostic experience is also enlarged by a course of six months as resident in the urologic wards of the Colonial Hospital. In these wards he has an opportunity to study the pre- and post-operative treatment of urologic conditions, as well as the clinical study and urologic diagnosis of patients kept under observation in the Colonial Hospital.

The surgical training consists of second assistant work in general and urologic surgery. Here opportunity is given to observe a large number of patients operated for diseases involving the urinary tract and associated organs. Additional opportunity is offered to assist in operations for general surgical conditions, and particularly general abdominal surgery.

Instruction in pathology similarly includes a great variety of pathological conditions involving the urinary tract, as well as those embraced

in general pathology. The courses in pathology offered are General Pathology with Dr. Wilson, Surgical Pathology with Dr. MacCarty and Dr. Broders and staff, and Pathologic Anatomy under Dr. Robertson.

Opportunities for research work on problems in bacteriology of the genito-urinary tract are provided under the supervision of Dr. Rosenow, Dr. Sanford, and Dr. Magath.

Fellows in urology are encouraged to keep in touch with current literature and the facilities of a large and complete library are offered to them, not alone in the library of the section, but in the general library of the Mayo Clinic.

In the investigation of clinical problems, opportunity is offered for reviewing records in the record room of the Mayo Clinic, where records of some half million patients are kept. Special cross files on cases involving the diseases of the urinary tract are kept in special rooms, permitting of thoro study of the clinical records of these conditions.

The fellow in urology is expected to be interested in experimental work and is given every opportunity to do this work in the experimental laboratories under the direction of Dr. F. C. Mann. In the new laboratory recently completed for this purpose every opportunity will be given for experimental work in physiology and other work, in our attempt to solve the problems involved in urologic diagnosis.

At the Colonial Hospital Dr. Von Lackum has charge of a urologic service, which involves the diagnosis and treatment of inflammatory infections of the urethra. Every opportunity is given for the careful study and treatment of urethritis and complications, and each fellow is expected to spend at least three months on this service.

Special attention is given to urography, including pyelography, ureterography, cystography, and urethrography. A considerable experience in interpretation is necessary in order to make this diagnostic feature of value. During the past year over a thousand urograms were made in the cystoscopic rooms. A special technician is attached to the urologic section, who devotes his time largely to urography and special roentgenograms of the urinary tract. The services of Dr. R. D. Carman, Dr. A. B. Moore, and Dr. C. G. Sutherland of the Department of Radiology are available for consultation.

Every afternoon there is an hourly conference of the urologic staff, during which time the problems arising during the morning are discussed and the cases reviewed.

A seminar covering the current urologic medical literature is held at stated intervals, in which all members of the section take part.

Minor course.—The course is open to a limited number of fellows (two annually) who are majoring in general surgery. It consists of a diagnostic service in the Section of Urology, extending over a period of six months.

MI65f,w,s,su. Urologic Diagnosis. Cystoscopic examination and history-taking in diseases of the genito-urinary tract. Six months. Dr. Braasch, Dr. Crenshaw, Dr. Bumpus.

M166f,w,s,su. Cystoscopy, Urethroscopy. Cystoscopic examination; urography; endoscopic operations; fulguration. Dr. Braasch, Dr. Crenshaw, Dr. Bumpus. (One and one-half years or more of service is offered as a part of a three-year fellowship for those desiring to specialize in urology.)

M167f,w,s,su. Special Urologic Treatment. A course of three months is offered in the study and treatment of infections of the urethra and adnexa. This course may be taken by those who are enrolled for either the major or the minor course in urology. Dr. Von Lackum.

DENTAL SURGERY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Research Professor Thomas B. Hartzell, D.D.M., M.D.

206f,w,s,su. Research in Mouth Infections. A study of dental and parodontal infections as related to systemic disease. Experimental study to determine the lesion produced in animals by bacteria from these sources. Dr. Hartzell.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Associate Professor Boyd S. Gardner, D.D.S.

The work in dental surgery in the Mayo Foundation is designed primarily for fellows or special students who are graduates in dentistry and who are majoring in dental surgery. The work is also open to graduate medical students.

OBSTETRICS AND GYNECOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Jennings C. Litzenberg, B.S., M.D., F.A.C.S. (Chief); Associate Professors Fred L. Adair, B.S., M.A., M.D., F.A.C.S., John L. Rothrock, M.A., M.D., F.A.C.S.; Assistant Professor Lee W. Barry, Ph.D., M.D., F.A.C.S.

Of the courses in other departments open to graduate medical students, the following are especially recommended for those desiring to specialize in obstetrics and gynecology.

Advanced Anatomy: gross and histological, of the female generative organs (Anatomy 153f-154w-155s-156su)

Fetal Anatomy: dissection of fetus and new-born (Anatomy 133f and 134f,s,su)

Implantation and Placentation (Anatomy 137f,w,s)

Advanced Physiologic Chemistry (Physiology 153f,w,s,su)

Gynecological Pathology (Pathology 118s)

Experimental Pharmacology (Pharmacology 104, 109a,b)

Other courses in fundamental or clinical subjects may be elected.

The following graduate courses are offered in the Department of Obstetrics and Gynecology (at Minneapolis):

- 117f-118w-119s-120su. Advanced Pathology of the Female Generative Organs. Required of first or second year fellows in obstetrics and gynecology. Prerequisite: Pathology 108, or equivalent. Dr. Adair.
- 121f-122w-123s-124su. Clinical Obstetrics and Gynecology. A course in diagnosis and treatment, with special study of selected cases. Clinic in the Out-Patient Department of the University Hospital, MWF, throughout the year. Required of first year fellows and may be elected by second year fellows. Dr. Litzenberg and staff.
- 125f-126w-127s-128su. Clinical Obstetrics and Gynecology. Similar to Course 111-114, but on TThS. Required of second year fellows, and may be elected by first year fellows. Dr. Litzenberg and staff.
- 201f-202w-203s-204su. Advanced Obstetrics and Gynecology. Includes service in the University Hospital or Minneapolis General Hospital, affording ample opportunity for experience in diagnosis, care, and treatment (operative and non-operative) of patients. Special facilities are offered for study of problems and cases of unusual interest. Required of first year fellows. Dr. Litzenberg, Dr. Adair, Dr. Barry.
- 205f-206w-207s-208su. Similar to Course 201-204, but more advanced, both in clinical and research aspects of the subjects, so as to be adapted to the increased training and experience. Required of second year fellows. A special fellowship may be taken in the Swedish Hospital during the second year under Dr. Adair. Dr. Litzenberg, Dr. Adair, Dr. Barry.
- 209f-210w-211s-212su. Similar to Courses 201-204 and 205-208 but more advanced. Required of third year fellows. Dr. Litzenberg, Dr. Adair, Dr. Barry.
- 213f-214w-215s. Seminar. A conference, including the fellows and graduate students. Presentation and discussion of original work and reports upon the current literature in obstetrics and gynecology. Reading knowledge of French and German is necessary. Dr. Litzenberg.
- 216f-217w-218s-219su. 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. Elective for second year fellows or other properly qualified graduate students. Dr. Litzenberg, Dr. Adair, Dr. Rothrock, Dr. Barry.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)

Associate Professor Robert D. Mussey, M.D.; Assistant Professor Leda J. Stacy, M.D.

Limited opportunities for work in obstetrics are available with Dr. Mussey.

M251f,w,s,su. Clinical Obstetrics and Gynecology. Diagnosis and treatment with special study of selected obstetric cases.

Opportunities for diagnostic work in gynecology are available with Dr. Stacy and Dr. Melson. (See M168 and M260 in the Department of Medicine.)

Operative work in gynecology in the Mayo Foundation is not segregated in any surgical section. It is therefore impossible to offer opportunity for special study in this field.

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

The graduate courses in these subjects are designed to prepare selected men for advanced work in the various lines, to prepare them for practice in these specialties, and to develop research and productive work in these subjects.

Of elective courses in other departments, the following are highly desirable.

Physics of Light and Acoustics

Advanced Optics

Advanced Anatomy of the Head and Neck

Topographic Anatomy of the Head and Neck

Advanced Histology and Embryology of the Eye, Ear, Nose, and Throat

Advanced Physiology of the Vision and Hearing

Physiologic Optics Seminar

Special Pathology of the Eye, Ear, Nose, and Throat

Immunity

Advanced Neuropathology

The Department of Ophthalmology and Oto-Laryngology in the Medical School, also offers a one-year course, to properly qualified graduate students, beginning with the fall quarter. This course is designed to give graduate students a training in the fundamentals (special anatomy, histology, embryology, pathology, physiology of special senses, physiologic optics) and clinical teaching in the Out-Patient Department in diagnosis and treatment. On the completion of this one-year course, students are urged to continue their work as residents in special hospitals, or further graduate clinical work in recognized institutions. Tuition fee for this course is sixty dollars per quarter.

A. COURSES OFFERED AT THE MEDICAL SCHOOL

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

Professor William R. Murray, Ph.B., M.D., F.A.C.S.; Associate Professor Frank E. Burch, M.D., F.A.C.S.; Assistant Professor Horace Newhart, B.A., M.D., F.A.C.S.

100f. Refraction. Lectures and demonstrations on the theory of refraction. 22 hours.

101f,w,s,su. Advanced Refraction. Practical work in the refraction clinics. Prerequisite: Course 100.

102f,w,s,su. Clinical Ophthalmology. Diagnosis and treatment of diseases of the eye. Daily attendance in the Out-Patient Department. 132 hours per quarter.

- 103w. Ocular Muscles. 18 hours.
- 104w. Perimetry. 18 hours.
- 105w,s. Ophthalmoscopy. 22 hours.
- 106w,s. Operative Surgery of the Eye. Operations on the cadaver and animal eyes. 18 hours.
- 107s. Neuro-Ophthalmology. Lectures and demonstrations. 18 hours.
- 108f,w,s,su. Ophthalmic Surgery. Operative clinic in the University Hospital. 22 hours per quarter.
- 200w,s. Seminar in Ophthalmology. Conducted by members of the staff and open to fellows, scholars, and qualified graduate students. 22 hours.
- 201f,w,s,su. Advanced Ophthalmology. Daily service in the University Hospital. Required of second and third year fellows, who will serve as assistants in operative and other clinical work.
- 202f,w,s,su. Research. Required of second and third year fellows who must complete a satisfactory thesis, based upon original work.
- 120f,w,s,su. Clinical Otology. Diagnosis and treatment of diseases of the ear. Daily attendance in the Out-Patient Department. 132 hours per quarter.
- 121f,w,s,su. Clinical Rhinology and Laryngology. Diagnosis and treatment of diseases of the nose and throat. Daily attendance in the Out-Patient Department. 132 hours per quarter.
- 122w. Operative Surgery of the Temporal Bone. Operations and demonstrations on the cadaver. 18 hours.
- 123w. Operative Surgery of the Nose and Throat. Operations and demonstrations on the cadaver. 18 hours.
- 124w,s. Functional Ear Tests. 12 hours.
- 125w,s. Diseases of the Labyrinth. 12 hours.
- 126w,s. Endoscopy. Lectures and demonstrations. 18 hours.
- 203w,s. Seminar in Oto-Laryngology. Conducted by members of the staff and open to fellows, scholars, and qualified graduate students. 22 hours.
- 204f,w,s,su. Advanced Oto-Laryngology. Daily service in the University hospitals. Required of second and third year fellows, who will serve as assistants in operative and other clinical work.

B. COURSES OFFERED IN THE MAYO FOUNDATION (ROCHESTER)
OPHTHALMOLOGY

Professor William L. Benedict, M.D.; Assistant Professor Avery D. Prangen, B.S., M.D.; Instructor Walter I. Lillie, M.D., M.S. in Ophthalmology, Henry P. Wagener, M.D., M.S. in Ophthalmology.

Fellows majoring in ophthalmology in the Mayo Foundation spend from six to nine months on the physics of light, physiologic optics, and anatomy, pathology, and bacteriology of the eye in the Medical School in Minneapolis. The remainder of their service is composed of the following:

- M151f,w,s,su. Clinical Ophthalmology. External diseases of the eye, ophthalmoscopy, ophthalmic surgery. Dr. Benedict.
- M152f,w,s,su. Refraction and Ophthalmic Myology. Theory of refraction, retinoscopy, diagnosis of refractive errors of the eye, prescribing of lenses, practical work on patients under supervision of instructor. Eye movements, disturbances of motility of the eyes. Dr. Prangen.
- M153f,w,s,su. Medical Ophthalmology. Ophthalmology in relation to general diseases. Dr. Benedict.
- M154f,w,s,su. Neuro-Ophthalmology. Ophthalmology in relation to diseases of the nervous system. Physiology of the eye, psychology of vision, functional eye disturbances. Dr. Lillie.
- M155f,w,s,su. Pathology of the Eye. Dr. Benedict.

NOTE.—Laboratory facilities for research in pathology and bacteriology of the eye, animal experimentation; demonstrations; weekly seminars held jointly by sections on Ophthalmology, Oto-Laryngology and Rhinology, and Laryngology, oral and plastic surgery.

OTO-LARYNGOLOGY AND RHINOLOGY

- Professors Harold I. Lillie, B.A., M.D., Gordon B. New, D.D.S., M.D.;
Assistant Professor Bert E. Hempstead, B.A., M.D.
- M157f,w,s,su. Diagnostic and Out-Patient Service. Diagnosis of neoplasms of the nose, throat, mouth, and neck. Plastic surgery of face and neck (pre- and post-operative treatment). Advanced laryngology as related to neurology and general medicine. Six months. Dr. New.
- M158f,w,s,su. Hospital Service. Internship in Worrell Hospital. Operative and radium treatment of tumors of the nose, throat, and mouth. Plastic surgery of the face and neck (operative). Six months. Dr. New.
- M159f,w,s,su. Clinical Oto-Laryngology and Rhinology. Theory and practice with differential diagnosis of diseases of the ear, nose, accessory sinuses, pharynx, and larynx and their relations to general diagnosis. Half time for nine months. Dr. Lillie, Dr. Hempstead.
- M160f,w,s,su. Pre-operative and Post-operative Care of Patients. Treatment of complications. Half time for nine months. Dr. Lillie, Dr. Hempstead.
- M161f,w,s,su. Operative Oto-Laryngology and Rhinology. Internship, second assistantship in operating service in Worrell Hospital. Half time for nine months. Dr. Lillie, Dr. Hempstead.
- M162f,w,s,su. Operative Oto-Laryngology and Rhinology. First assistantship in operative service in Worrell Hospital. Half time for nine months. Dr. Lillie, Dr. Hempstead.
- M251f,w,s,su. Pathology. Opportunity will be given fellows during the service to study the gross and microscopic pathology of tumors of the nose, throat, and mouth in connection with the clinical material. Dr. Broders, Dr. New.

RADIOLOGY

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Professor Henry A. Erikson, B.E.E., Ph.D.; Assistant Professor Robert G. Allison, M.D.

Graduates of Class A schools who have completed at least one year's satisfactory internship in a recognized hospital are eligible for an appointment as a fellow in radiology. The student must carry one major and two minor branches. The major shall be in radiology and one of the minor branches must be in physics. The course extends over a period of three years. The course in radiology covers the use of the X-ray as a means or aid to diagnosis in all branches of medicine. In addition the use of both superficial and deep radiation in therapy is taught.

The X-ray departments of the following hospitals are all fully equipped with modern diagnostic and therapeutic equipment and are available to fellows in radiology.

1. *University Hospital*.—Offers unusual clinical material of a chronic nature. There is an immense amount of material available in gastro-intestinal, chest, bone, and urological diagnosis. Unusual opportunity is given the student for pre-operative study of the case and post-operative study of the material removed at operation. The Dermatological Department furnishes a large number of both acute and chronic skin diseases for treatment.

2. *Minneapolis General Hospital*.—This institution offers an immense amount of material in acute and chronic diseases. There is an exceptional amount of work in acute respiratory and cardiac diseases. There is a very large fracture service in this institution.

3. *Glen Lake Sanatorium*.—This institution, with its 500 beds devoted to the treatment and diagnosis of all types of tuberculosis, offers the student excellent opportunity to follow both the clinical and radiological course of the diseases while undergoing treatment. Routine X-ray examinations, both pulmonary and gastro-intestinal, are done on admission and at intervals during the patient's stay in the institution.

4. *Lymanhurst School*.—Routine physical and X-ray examinations of all school children suspected of having pulmonary tuberculosis are conducted at this institution. The student is given an unusual opportunity to correlate the physical and X-ray findings in childhood tuberculosis.

5. *The Cancer Hospital*.—This hospital, which will be available shortly, will be situated on the University campus and will have an initial capacity of fifty beds. It will be devoted entirely to deep roentgen ray and radium therapy. It will be fully equipped with the newest types of deep therapy machines. A radium emanation plant will be housed in this building. This institution will be run and staffed by the staff of the University Hospital. The student will here obtain unlimited experience in roentgen and radium therapy. He will also be taught the collection of radium emanation.

B. COURSES OFFERED IN THE MAYO FOUNDATION

Professor Russell D. Carman, M.D.; Associate Professor Alexander B. Moore, M.D.; Instructors Harry H. Bowing, B.S., M.D., Albert Miller, M.D., Charles G. Sutherland, M.B.

The opportunities offered in radiology in the Mayo Foundation are designed to permit selected men to fit themselves for advanced work in this specialty. Unless the prospective fellow's preparation in normal anatomy, physiology, and pathology has been unusually good, at least a year should be spent in intensive study before entering on the special three years' course. The course in radiology covers every branch of work with the X-ray and radium as applied in medicine. All laboratories are modernly and thoroughly equipped. In addition to the routine work, seminars are held weekly in each division for the discussion of unusual problems and interesting cases. The library of the clinic and that of the department are well supplied with texts and journals dealing with radiology, and free use of these is expected. Individual research is encouraged in any radiologic problem which especially interests the student.

- M151f,w,s,su. General Roentgenologic Technic. Practical instruction in the employment of all varieties of roentgenologic apparatus including transformers, vacuum tubes, tables, plates, films, intensifying screens, Bucky-Potter diaphragms, and developers, as used in roentgenography, stereoroentgenography, and roentgenoscopy. Dr. Carman, Dr. Moore, Dr. Sutherland.
- M152f,w,s,su. Special Applications of Roentgenology. By assisting in the routine work of the laboratory the student is given abundant opportunity to become familiar with the roentgenography of the osseous system, chest, heart, lungs, and urinary system, and with the special technics required for accessory sinuses, mastoids, ventriculography, and pyelography. Unusual facilities and material are furnished for the roentgenoscopy and roentgenography of the gastro-intestinal tract. Dr. Carman, Dr. Moore, Mr. Miller, Dr. Sutherland.
- M153f,w,s,su. Roentgen Therapy. The installation for roentgen therapy comprises four medium voltage machines and one high voltage machine, the latter operating two rooms simultaneously. Fellowship men have the privilege of examining patients having the various benign and malignant diseases to which roentgen treatment is applicable, and observing its effects, both early and late. Technic suitable for the various conditions are taught by practical demonstration. Instruction is given as to the mode of production, sequelae, prevention and treatment of roentgen dermatitis; the causes, symptoms, and methods of minimizing radiation sickness; and the avoidance of danger from high tension currents. Dr. Des jardins.
- M154f,w,s,su. Radium Therapy. Technics are demonstrated in the preparation and handling of radium tubes, needles, and plaques for therapeutic use, with methods of protection from professional injuries produced by radium. A large number of patients and an adequate

supply of radium permit a practical exhibition of its application in general surgery, gynecology, ophthalmology, internal medicine, and diseases of the ductless glands, showing the biologic effects, reactions, and dosage. Dr. Bowling.

M251f,w,s,su. Physics of Radiology. A physical research laboratory is affiliated with the department of radiology, and the problems of this department constitute the major portion of the work done. Instruction is offered in electricity and magnetism, their phenomena, nature, and properties; sources of electric energy; types of currents, continuous and alternating; units of electric measurement, voltage, amperage, and wattage; the interrupterless transformer; vacuum tubes, types, penetration measurements. Training is offered in the use of instruments for measuring rays and for standardizing radiation apparatus. The physical laboratory is so situated that measurements can conveniently be made on the roentgen treatment machine. In the laboratory there is also a complete apparatus for radium emanations, with the necessary auxiliary measuring devices.

M257f,w,s,su. Interpretation of Roentgenologic Findings. This very important field of roentgenology receives particular attention, and thorough training is given in the reading of plates and screen images, the recognition of normal and abnormal conditions, the roentgen signs of disease, both direct and indirect, roentgenologic differential diagnosis, the correlation of plate and screen findings, and the correlation of clinical and roentgenologic findings. In addition to the large current material, an extensive file of lantern slide reductions, exemplifying a wide variety of disease conditions, is accessible for study and comparison. Dr. Carman, Dr. Moore, Dr. Miller, Dr. Sutherland.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

A. COURSES OFFERED AT THE MEDICAL SCHOOL

Associate Professor Albert J. Chesley, M.D.; Assistant Professors Harold S. Diehl, M.A., M.D., Orianna McDaniel, M.D., Jay A. Myers, Ph.D., M.D., E. M. Wade, M.A., H. A. Whittaker, B.A.

Inquiries concerning other work in public health should be addressed to the director, Dr. H. S. Diehl, Millard Hall, Minneapolis.

102. Sanitation. Sanitary supervision of water and milk supplies, sewerage systems and sewage, refuse, and garbage disposal systems. Practical work including field investigations, laboratory examinations, interpretation of results, recommendations to correct unsatisfactory conditions, report-writing and office procedure. Open only to graduate students who have had Bacteriology 101; Chemistry 20-21, 35-36; Physics 22, 32, 42. Credits arranged. Mr. Whittaker.
103. Public Health Bacteriology. Modern methods of a public health laboratory in making diagnoses; in the preparation of vaccines, and in research. Prerequisites: Bacteriology 101, 106. Credits arranged. Miss Wade.

104. Epidemiology. Lectures on principles and methods of epidemiological investigation. Analysis of data; methods of research conclusions; individual field work; collateral reading. Open only to graduate medical students. Credits arranged. Dr. Chesley, Dr. McDaniel.
105. Vital Statistics. Application of statistical methods to morbidity and mortality figures; births and deaths; the drawing of conclusions; preparation of tables and graphs; measurement of effectiveness of health activities; calculation of expectancy; actual experience with the State Board of Health. Prerequisites: 51 and Econ. 14. Credits arranged. Dr. Chesley.
106. Public Health Administration. Organization of state, municipal, and voluntary health activities; preparation of budgets; procedures in enforcing quarantine; in correcting unsanitary conditions; in controlling tuberculosis and venereal diseases; value of sanitary surveys, food inspections, etc. Prerequisite: 54 or 56. Credits arranged. Dr. Diehl, Dr. Chesley.
108. Field Work in Public Health. This will consist of actual health work, under supervision, in one or more of the approved public health organizations. The time, assignment, and credits will be arranged. Prerequisite: 104 or 106.
201. Research. Opportunities will be offered by the University and by the various co-ordinated organizations for qualified students to pursue research work. Dr. Diehl, Dr. Myers, Dr. Chesley.

ADDITIONAL COURSES

Other courses offered in this and the Graduate School bulletin which bear on work in public health:

Department	Course Title	Course Number
Animal Biology	Protozoology	107
Economics	Theory of Statistics.....	113
Chemistry	Sanitary Water Analysis.....	126
Political Science	Government of Minnesota.....	111
Psychology	Social Psychology	127
Sociology	Methods of Social Investigation.....	122
Education	Elementary Educational Psychology.....	139
Education	Mental Tests and Mental Diagnosis.....	135-136
Physiology	Physiology	101-102-103-104
Pathology	Pathology	101-102
Bacteriology and Immunology	Special Bacteriology	101
Bacteriology and Immunology	Household Bacteriology	105
Bacteriology and Immunology	Higher Bacteria	114

Bacteriology and		
Immunology	Immunity	116
Engineering	Water Supply Engineering.....	162
Engineering	Sanitary Engineering	163
Engineering	Water and Sewage Purification	261

B. COURSES OFFERED IN THE MAYO FOUNDATION

The only work in Preventive Medicine and Public Health offered in the Mayo Foundation is in connection with the Department of Pediatrics. See statement of that department.

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

The School of Business

Part I

Announcement of Courses for the Years
1924-1926



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THE SCHOOL OF BUSINESS

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Reuel I. Lund, M.A., C.P.A., Instructor in Accounting
Duane McCracken, M.A., Instructor in Economics
Harry J. Ostlund, B.A., Instructor in Accounting
George M. Peterson, M.A., Instructor in Economics

* Absent on leave, 1924-25.

Fred E. Ringham, B.A., Instructor in Accounting
William H. Stead, M.A., Instructor in Economics
W. Bayard Taylor, M.A., Instructor in Economics
Arthur R. Upgren, B.A., Instructor in Economics
Warren C. Waite, M.A., Instructor in Economics
Nina Louise Youngs, B.A., Instructor in Accounting

SPECIAL LECTURERS

David Bryn-Jones, Professor of Economics, Carleton College
H. A. Bullis, General Auditor, Washburn-Crosby Company
P. H. Carr, President, Retail Credit Men's Association, Minneapolis
C. R. Chaney, President, American Institute of Banking
D. G. Congdon, Advertising Manager, Confer Brothers, Realtors
G. M. Gillette, President, Minneapolis Steel and Machinery Company
W. H. Ingersoll, President, Ingersoll Redipoint Company
George M. Link, Executive Secretary, Board of Estimate and Taxation,
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S. C. McCleod, Secretary of the National Association of Cost Accountants
John J. McHugh, Secretary, Minneapolis Chamber of Commerce
Wallace D. O'Brien, General Agent, Freight Department, Northern Pacific
Railroad, St. Paul
R. H. Pearce, Manager, Export Department of Washburn-Crosby, Min-
neapolis
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Miss Frances Penrose, Educational Director, Powers Mercantile Company
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Leslie Vickers, National Industrial Conference Board, New York City
Mrs. Frank Wallace Women's Department, Farmers and Mechanics Bank
Mrs. Frank M. Warren, Regent, University of Minnesota

GENERAL INFORMATION

PURPOSE

The School of Business recognizes the professional status of the business executive. It aims to give prospective executives thoro training for the work they are to undertake. Professional education rather than detailed drill in narrow technical processes is the object toward which instruction is directed. Scientific method in analyzing business data, trained intelligence in dealing with the human relationships of which business is made up, and a well-developed sense of moral responsibility will be the foundations of business effectiveness in the future. The School of Business combines with a well-rounded university education the kind of training that will prepare students to analyze business situations accurately and to bring together results of analysis into practical working plans.

LOCATION AND EQUIPMENT

The University of Minnesota is well situated with respect to education for business. With the business districts of the Twin Cities on either side, the opportunities for observing business processes and for effective field work and research are unsurpassed. The cordial support of business organizations and individual concerns in the Twin Cities is a large factor in making the resources of the metropolitan district available for developing and presenting subject-matter in every field of study covered. Equally valuable is the support of business men throughout the state. The close contact which members of the faculty have with the business of the Northwest greatly enhances the opportunities that students in the School of Business enjoy. Co-operation with the College of Agriculture, Forestry, and Home Economics brings the School of Business into contact with the agricultural background of many business problems. This co-operation is especially exemplified in the joint provision in the two schools for work in agricultural economics. Co-operation with Engineering, Law, and various departments of the College of Science, Literature, and the Arts is also an important factor in bringing many viewpoints to bear upon the business problems with which the student has to deal.

The library and laboratory facilities of the University are of a sort to contribute effectively to the success of the work which the School of Business is undertaking.

THE SCHOOL OF BUSINESS TRAINING CLASSES IN TWIN CITY BUSINESS ESTABLISHMENTS

During the past year, arrangements have been made with a number of Twin City business firms whereby seniors in the School of Business are afforded the opportunity of supplementing their studies with carefully supervised business practice. Through a logically worked out system of rotation, familiarity is gained with the operation of each important department. The student's University program is so arranged that he is able to give an average of two days per week to this phase of his training.

ADMISSION TO THE SCHOOL OF BUSINESS

For admission to the School of Business a student must have satisfied the requirements of one of the two-year pre-business courses, either in the College of Science, Literature, and the Arts, the College of Agriculture, Forestry, and Home Economics, or the College of Engineering. (See page 9.) However, students entering from other colleges and universities of recognized standing may be admitted if deficient in not more than two of the following: accounting, psychology, statistics, provided (1) that this deficiency is removed during the first year in the School of Business, and (2) that a minimum of 90 credits and 90 honor points is granted by the University examiner for the work done elsewhere.

SPECIAL STUDENTS

A limited number of high school graduates who have reached the age of twenty-four and can furnish evidence to the effect that they have had at least three years of successful business experience in an executive capacity may be admitted as special students. They will be required to maintain a C average and must not elect more than 12 hours of work per quarter. If later they decide to become candidates for a degree they must complete the requirements of the pre-business course.

STUDENTS IN OTHER SCHOOLS OR COLLEGES OF THE UNIVERSITY

Regularly enrolled students in other schools or colleges of the University may be admitted to such courses in the School of Business as are authorized by the faculties of the School of Business and the school or college concerned. Such students are urged to select their business subjects in accordance with a definite plan, and as far as possible to complete a systematic course of business study. *Only those courses in the School of Business are open to students of other schools or colleges of the University which are announced in the bulletin of that school or college.*

ADVANCED STANDING

Appropriate credit in the School of Business may be given for work of a similar character done in other approved colleges and universities, but no student may become a candidate for a degree in the School of Business who has not completed the senior year under the faculty of that school.

CREDITS

Requirements for graduation are expressed in credit hours, indicating amount of work done, and in honor points, indicating grade of work. Honor points are computed as follows: Each credit hour with the grade of A carries 3 honor points; each credit hour with the grade of B, 2 honor points; each credit hour with the grade of C, 1 honor point.

No regular student will be permitted to elect more than 17 nor less than 13 hours of work in any one quarter unless he receives special permission by petition to the Students' Work Committee.

Candidates for the degree of bachelor of science in business must have earned a minimum of 180 credits and at least one honor point for each

credit, (192 credits in the case of agricultural business and 187 credits in the case of industrial administration students) or a smaller number of credits determined as follows: For every 5 honor points in excess of 1 honor point per credit, the number 180 is diminished by 1, but no student will be recommended for graduation who has not acquired thoro proficiency in his field of specialization.

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 faculty of the School of Business allow 12 credits for the two-year Advanced R.O.T.C. Course, which may be applied toward the degree of bachelor of science in business.

REGISTRATION

The dates of registration for both old and new students for 1924-25 are September 25 and 26. Pre-business sophomores and students coming with advanced standing from other institutions should obtain from the University registrar copies of their records and submit them to the dean of the School of Business. In the case of pre-business students this must be done before the close of the preceding spring quarter.

DEGREES

Bachelor of Science in Business

Candidates who have met the conditions for entrance to the School of Business, having satisfactorily completed the work covered in one of the pre-business courses at the University of Minnesota, should normally be able to qualify for the degree of bachelor of science in business at the end of the two full academic years of study in the School of Business.

If within a reasonable time after admission to the school, a student's work does not give promise of effectiveness in the business field, he will be discouraged from continuing the course, even tho he may have received passing grades in the subjects taken. It is expected that students will meet the requirements imposed with the same professional spirit and measure of precision demanded in well-regulated business houses, and students who fail to come up to the standard will not be recommended for the degree.

The degree is not awarded merely as the result of pursuing a specified number of courses.

Master of Science in Business

Students who have completed the course of study required for the degree of bachelor of science in business or its equivalent may enroll in the Graduate School and become candidates for the degree of master of science in business. Emphasis will be laid on individual work under the direction of particular members of the faculty rather than upon class instruction, and the student must present evidence of at least six months of successful experience in a responsible business position.

The general requirements for the Master's degree may be found in detail in the annual announcement of the Graduate School.

FEEES

Tuition fees (per quarter)	
Residents of Minnesota.....	\$30.00
Non-residents	40.00
Deposit* (first quarter only).....	5.00
Military deposit (required of all students taking military drill).....	10.00
Health fee (per quarter).....	2.00
Minnesota Union or Shevlin Hall (per quarter).....	1.00
Special fees:	
Examination for removal of condition.....	1.00
Examinations for credit (after the first quarter in residence)....	5.00
Special examination	5.00
Chemistry deposit	5.00

Penalty Fees

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

For information concerning living expenses, students are referred to the bulletin of general information.

The School of Business does not encourage students to enter entirely without funds. The intensive work required in the school will make it highly desirable for a person to devote all his time and energy to his studies.

EMPLOYMENT OF STUDENTS

Altho the School of Business does not promise to secure positions for its graduates, every effort is made to find positions for those students who have made a good record. Many business men have expressed a desire to co-operate with the school in placing the students both for summer work and in permanent positions.

* The following charges are made against the general deposit for each student in addition to such charges as may be incurred for lockers, library penalties, laboratory breakage, etc.:

<i>Minnesota Daily</i>	\$0.50 a quarter
Post-office box	0.20 a quarter
<i>University Address Book</i>	0.35

SCHOOL OF BUSINESS

STUDENT ORGANIZATIONS

The Commerce Club

The Commerce Club was organized by the students of the School of Business in the fall of 1919. The object of the club is to bring the men of the school together in an informal way for the purpose of promoting a serious interest in business problems. Some prominent business men addresses the students at each meeting. Membership is confined to the students and faculty of the School of Business and to pre-business students in the College of Science, Literature, and the Arts.

Beta Gamma Sigma

A chapter of Beta Gamma Sigma, the national honorary business fraternity, has been installed at the University. Members are selected upon the basis of scholarship and personality.

The University Business Women's Club

This is an organization of business and pre-business women. Its purposes are: (1) to form direct contacts with business problems through addresses by successful business men and women and visits to business establishments; (2) to bring together in a social way University women interested in business.

Gamma Epsilon Pi

A chapter of Gamma Epsilon Pi, a national honorary and professional business sorority, has recently been established. High scholarship, personality, and interest in school activities are requirements for membership.

THE COURSES OF STUDY

FRESHMAN AND SOPHOMORE YEARS

The work of the freshman and sophomore years known as the pre-business course is, in most cases, taken in the College of Science, Literature, and the Arts. For students interested in agricultural business, the pre-business course is taken in the College of Agriculture, Forestry, and Home Economics. A pre-business course in the College of Engineering and Architecture is available for students expecting to engage in manufacturing.

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

1. Ten credits in Introduction to Economics (Economics 1-2)
2. Fifteen credits in English-Rhetoric (Rhetoric A-B-C)
3. Ten credits in *one* of the following social sciences: history, political science, sociology
- †4. Ten credits in mathematics or in *one* of the laboratory sciences, (animal biology, botany, chemistry, physics)
5. Five credits in Mechanism of Exchange (Economics 5)
6. Six credits in psychology (Psychology 1-6)
7. Ten credits in the Principles of Economics (Economics 6-7)
8. Eight credits in the Principles of Accounting (eleven credits for students specializing in accounting) (Economics 25-26-27)
9. Five credits in Statistics (Economics 14)
10. Sufficient electives to make a minimum of 90 credits with one honor point for each credit, or a smaller number of credits determined as follows: for every 5 honor points in excess of one honor point for credit, the number 90 is diminished by one.

II. Students who wish to prepare for some branch of business which relates to agriculture, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like, will find it to their interest to include courses in agriculture as part of their pre-business training. This may be arranged in two ways, as follows:

A. Register in the College of Agriculture, Forestry, and Home Economics and take the following courses:

1. Ten or twelve credits in General Inorganic Chemistry (Chemistry 1-2-3)
2. Five credits in Types and Breeds of Livestock (Animal Husbandry 11-12)
3. One credit in Tree Crops (Forestry 26)
4. Nine credits in Rhetoric (Rhetoric 1-2-3)
5. Nine credits in General Botany (Botany 4-5-6)
6. Five credits in Economic Geography of Agriculture (Agricultural Economics 20)
7. Five credits in Economic History of Agriculture (Agricultural Economics 21)
8. Five credits in Elements of Dairying (Dairy Husbandry 1)
9. Five credits in Principles of Economics (Agricultural Economics 5)
10. Three credits in Agricultural Economics (Agricultural Economics 6)
11. Nine credits in General Zoology (Animal Biology 14-15-16)
12. Three credits in Farm Crops (Agronomy 1)
13. Eight credits in Principles of Accounting (Economics 25-26)
14. Five credits in Farm Engineering (Agricultural Engineering 8)
15. Three credits in Fruit-Growing (Horticulture 6) or Vegetable-Growing (Horticulture 32)

† Students who expect to specialize in accounting or banking should take Mathematics 8 and 20.

16. Five credits in Statistics (Agricultural Economics 13)
 17. Six credits in psychology (Psychology 1-6)
 18. Sufficient work from the following list to make a minimum of 102 credits:
- Six credits in Soils (Soils 4-5)
 - Five credits in Argumentation (Rhetoric 11) or Public Speaking (Rhetoric 22)
 - Five credits in Agricultural Physics (Agricultural Engineering 23)
 - Five credits in Commerce Algebra (Mathematics 8) or Applied Mathematics.
 - Five credits in bacteriology (Bacteriology 51)
 - Ten credits in Agricultural Biochemistry (Agricultural Biochemistry 7-8,
 - Two credits in Mechanical Drawing (Agricultural Engineering 3)

A standing of one honor point for each credit is required for admission to the School of Business.

Students considering this group of courses should consult the bulletin of courses in agriculture for further particulars as to courses, registration, etc.

B. Register in the College of Science, Literature, and the Arts and make substitutions for certain of the regular requirements of the pre-business course of the College of Science, Literature, and the Arts as follows:

Economics 20-21 for Economics 1-2

Economics 5 and 6 for Economics 3-4

Economics 13 for Economics 14

Political Science 1 for item number 3, Pre-Business course

Twenty credits in chemistry or animal biology and botany for item number 4

At least 5 credits in technical agricultural subjects should be selected in addition to the regular 90 hours.

III. Students who expect to engage in administrative work in manufacturing industries, should take their pre-business work in the College of Engineering and Architecture. The following prescribed program* for the freshman and sophomore years must be completed prior to registration in the course in Industrial Administration in the School of Business. A minimum of 97 credits is required for admission to the School of Business from this course.

FRESHMAN YEAR					
FALL		WINTER		SPRING	
	Hours		Hours		Hours
M. & M. 11 College Algebra	5	M. & M. 12 Trigonometry	5	M. & M. 13 Analytic Geometry	5
Chem. 4 General Inorganic Chemistry.....	4	Chem. 5 General Inorganic Chemistry.....	4	Qualitative Analysis... ..	5
				Rhet. 6 Rhetoric.....	3
Chem. 14 General Inorganic Chemistry... ..	5	Chem. 15 General Inorganic Chemistry... ..	5	Draw. 3 Descriptive Geometry	3
Rhet. 4 Rhetoric and Composition	3	Rhet. 5 Rhetoric and Composition	3	M.E. 11, 12, or 13 Shop Practice	2
Draw. 1 Engineering Drawing	3	Draw. 2 Engineering Drawing	3	P.H. 2 Hygiene and First Aid	0
M.E. 11, 12, or 13 Shop Practice	2	M.E. 11, 12, or 13 Shop Practice	2	Mil. 3 Military Science and Tactics.....	0
G.E. 11 Orientation... ..	0	G.E. 12 Orientation... ..	0		18
Mil. 1 Military Science and Tactics.....	0	Mil. 2 Military Science and Tactics	0		
	17 or 18		17 or 18		

* See bulletin of College of Engineering and Architecture for description of courses.

COURSES OF STUDY

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SOPHOMORE YEAR

FALL	Hours	WINTER	Hours	SPRING	Hours
M. & M. 91 Calculus..	4	M. & M. 92 Mechanics.	4	M. & M. 93 Materials.	4
Phys. 3 Mechanics and Sound	3	Phys. 23 Heat.....	3	Phys. 43 Magnetism and Electricity	3
Phys. 4 Mechanics Lab- oratory	1	Phys. 24 Heat Labora- tory	1	Phys. 44 Electrical Lab- oratory	1
Econ. 8 General Eco- nomics	3	Econ. 9 General Eco- nomics	3	Econ. 10 General Eco- nomics	3
M.E. 14 Machine Shop Practice	4	Econ. 25 Principles of Accounting	4	Econ. 26 Principles of Accounting	4
Psyc. 1 General Psy- chology	3	Psy. 6 General Psy- chology	3	M.E. 21 Mechanical Technology	1
	—		18	M.E. 41 Automotives..	2
	18				—
					18

JUNIOR AND SENIOR YEARS

The work of the junior and senior years is taken in the School of Business, where stress is laid upon the adaptation of the student's curriculum to his future plans. In order to make this aim effective, every student is assigned to an adviser who makes a study of his needs and helps him to frame a program which will most nearly meet them.

The programs of study summarized below will therefore be varied as each particular case dictates. In some cases the student will be advised to elect subjects in other schools and colleges of the University in order to obtain a well-rounded preparation for his prospective career.

I. THE GENERAL COURSE IN BUSINESS

This course is recommended to those persons who desire a well-balanced training in the important fields of business education or for those who are not yet able to decide upon a specialized field. The program is made up of courses in finance, business law, marketing, transportation, labor, and advanced general economics, with sufficient leeway for electives in other fields.

II. ACCOUNTING

The program in accounting is designed to meet the needs of those persons who are preparing for public accounting, the teaching of accounting, or for positions as accountants in financial or business establishments. In this program, courses in cost and industrial accounting, practice and procedure, income tax accounting, and auditing are required in addition to courses which afford a survey of all of the important fields of business.

III. AGRICULTURAL BUSINESS

This line of specialization is intended for students who wish to prepare for some branch of business which relates to agriculture, such as the marketing of farm products, farm finance, farm implements, farm real estate,

country merchandising, and the like. Supplementary courses in technical agriculture should be made a part of the freshman and sophomore programs of students who expect to choose this program. It differs from the general course chiefly with respect to the amount of work required in agricultural economics.

IV. BANKING

The program in banking is designed for persons who expect to become connected with banks and bond houses. It aims to supplement the broad general training in economics, given to all School of Business students, with courses which will be of value to persons who have to deal intimately with financial questions. Courses in foreign exchange, investments, corporate finance, and current financial problems are special requirements in this program.

V. FOREIGN TRADE

The course in foreign trade is designed for persons who plan to associate themselves with exporting houses or with export departments of large manufacturing and mercantile establishments. The special requirements of this course are an intimate knowledge of commercial policies, international commercial law, geography, and principles of international banking and exchange.

VI. PERSONNEL MANAGEMENT

This program offers basic training to (1) prospective heads of personnel departments in business establishments or of subdivisions thereof, and (2) to persons who expect to participate as trained experts in the adjustment of matters pertaining to the employment of labor. Thoro training in psychology and personnel administration are the outstanding features of the course.

VII. MERCHANDISING

The subjects offered here are sufficiently fundamental and the freedom of election sufficiently great to include preparation for both wholesaling and retailing businesses. Special attention is given to the problems of advertising, store management, and sales policy, but insistence is placed upon a thoro understanding of the economic, accounting, and statistical problems of the merchandising field.

VIII. SECRETARIAL COURSE

The courses offered in this program are arranged for the training of secretaries and assistants. If possible, the student should select supplementary courses which will best fit him for the special type of secretarial work he desires to enter. Emphasis is placed upon securing a complete understanding of the duties of a secretary, the organization and management of an office, and a thoro mastery of spoken and written English.

IX. INDUSTRIAL ADMINISTRATION

As the name indicates, this course involves a knowledge of industrial processes and it should therefore be preceded by the two-year pre-business course offered in the College of Engineering and Architecture. The work offered to all business students is supplemented by such electives in business administration and engineering as will give a well-rounded foundation for a person who expects to engage in manufacturing.

RELATED COURSES IN OTHER COLLEGES

The following courses are given under the direction of the Department of Political Science, College of Science, Literature, and the Arts:

1. *Diplomatic and consular service*.—Students looking forward to this field of work should take a major sequence in political science and such additional work in economics, history, geography, languages, and law as may be prescribed by the major adviser or the committee in charge of the course. A fifth year of work to be taken in the Graduate School is also strongly recommended. Consult Mr. Allin or Mr. Quigley.
2. *Municipal Administration and Engineering*.—By arrangement with the College of Engineering and Architecture, a combined course in Municipal Administration and Engineering has been provided, leading to the bachelor of science degree at the end of the fourth year, and the master of science degree at the end of the fifth year.

In the Junior College the student should take the mathematics and drawing work required of engineering students, American and Municipal Government, Principles of Economics and Physics. In the Senior College he should take from 24 to 30 credits in political science selected from the following courses: 111, 113, 115, 130, 131, 132, 141, 145, 151-152, 155, 157, and 159; from 15 to 18 credits in economics selected from the following courses: 14, 25-26, 154, 161, 191-192, 193; from 18 to 24 credits in civil engineering selected from the following courses: 11-12-13, 51-52-53, 162, 163, 272; and such work in bacteriology, public health, sociology, and other fields as may be prescribed by the adviser. Graduate work will be handled by special arrangement. Consult Mr. Anderson or Mr. Lambie.

DESCRIPTION OF COURSES

ACCOUNTING

- 25-25†-27. Principles of Accounting. Agricultural students see Agricultural Economics 28. Engineering students see Economics 29, College of Engineering bulletin.
- 131f-132w-133s.† Cost Accounting. Business students who desire a single quarter's survey of this subject should elect it under the course number 130f. Engineering students see Economics 93, College of Engineering bulletin.
- 134f. Income Tax Accounting.
- 135w-136s.† Auditing.
- 137f-138w-139s.† Accounting Practice and Procedure.
- 180f-181w-182s.† Senior Seminar. Section A. Accounting.

ADMINISTRATION

- 85f,s. Principles of Marketing. A general course dealing with the mechanism and operation of markets: classification, organization, market agencies as factors in production. The price-making process: control of supply, assumption of risk, incidence of marketing costs. Wastes of competition.
- 86s. Office Organization and Management.
- 88s. Advertising.
- 89f,s. Principles of Industrial Organization. Administration of business enterprises; co-ordination of men and departments; delegation of authority; planning, production control; scientific management. Engineering students see Economics 91w, College of Engineering bulletin.
- 94f-95w-96s. Secretarial Administration. (For juniors.)
- 97f-98w-99s. Advanced Secretarial Administration. (For seniors.)
- 108w.* Marketing Organization: Agricultural Products. The principles of organization of the market and of marketing enterprises applied especially to farm products. (Not open to those taking the agricultural business course of study.)
- 180f-181w-182s.† Senior Seminar. Section C. Marketing.

AGRICULTURAL ECONOMICS

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

- 110f-111w. Economics of Agricultural Production I and II.
- 130w. Prices of Farm Products.
- 131s. Market Prices.
- 135s. Methods of Forecasting Farm Prices of Farm Products.

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

* Offered on Minneapolis campus.

- 144f. Principles of Co-operation.
 145w-146s.* Marketing Management.
 170s.* Land Economics.
 171s. Land Tenure. (Not offered in 1924-25.)
 219f-220w-221s. Seminar in Agricultural Economics.

COMMERCE

- 176f,s. Commercial Policies. Theory of international commerce; free trade, reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign politics, and other governmental and organized efforts to affect trade. American problems emphasized.
 177w. Foreign Trade.

ECONOMIC THEORY

- 1f-2w. Introduction to Economics. Principles of economics relating especially to productive organization, considered from standpoint of society as a whole and of individual enterprises. Application of principles and necessary description of industry and commerce. Emphasis upon localization of enterprises.
 6f-7w. Principles of Economics. Engineering students see Economics 8-9-10, College of Engineering bulletin.
 90s. Economics of Consumption. (See Economics 90, College of Agriculture bulletin.)
 101f-102w.† Advanced General Economics.
 103f-104w.† Value and Distribution.
 105s. History of Economic Ideas.
 203f-204w-205s.† Graduate Seminar in Economic Theory.

FINANCE

- 5s. The Mechanism of Exchange. Relation to economic system. Monetary principles, special reference to United States. American banking and bank organization, principles of commercial, non-commercial banking.
 50s. Farm Finance. (See College of Agriculture bulletin.)
 143f-144w,w-s.† The Financial System.

Note.—After 1925-26 this course will be discontinued. Economics 5, the Mechanism of Exchange, and 141, Financial Policies, will take its place.

- 145s. Foreign Exchange.
 146f. Investments.
 147s. Bank Administration.
 149w,s. Business Cycles. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and

* Offered on Minneapolis campus.

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

financial panics. Critical examination of all the available business barometers designed to forecast similar conditions.

150s. Advanced Farm Finance.

155s. Corporation Finance. Engineering students see Economics 92, College of Engineering bulletin.

156f. Advanced Corporation Finance.

180f-181w-182s.† Senior Seminar. Section B. Business Finance.

191f-192w.† Public Finance.

193s. State and Local Taxation.

243f-244w-245s.† Graduate Seminar in Private Finance.

GEOGRAPHY

See bulletin of College of Science, Literature, and the Arts.

1-2.† Introduction to Human Geography.

33. Climatology.

41. Geography of Commercial Production.

62. Trade Routes and Trade Centers.

71. Geography of North America.

81. Geography of Minnesota.

HISTORY (Economic)

See bulletin of College of Science, Literature, and the Arts.

80f-81w. Introduction to Economic History.

118-119-120. Economic History of Europe and the United States, 1750 to the Present.

121-122-123. Economic History of Europe, 1300-1750. (Not offered in 1924-25.)

170s. Economic History of the United States since the Civil War.

210-211-212. Seminar in Economic History. (Not offered in 1924-25.)

INSURANCE

59f. Life Insurance.

60s. Property Insurance.

62w. Social Insurance.

LABOR AND PERSONNEL MANAGEMENT

161f,w. Labor Problems and Trade Unionism.

162w. Labor Movement in America and England.

167w. Personnel Administration. Managerial policy for various types of organization, of labor. Special attention to job analysis, employment incentives, and regularization of employment.

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

- 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.
- 169s. The Labor and Socialist Movement in Europe.
- 180f-181w-182s.† Senior Seminar. Section D. Labor.

MATHEMATICS

See bulletin of College of Science, Literature, and the Arts.

8. Commerce Algebra.
20. Mathematics of Investment.

POLITICAL SCIENCE (including Business Law)

See bulletin of College of Science, Literature, and the Arts

- 51f-52w-53s.† Business Law.
- 65w. Colonization.
- 157f. Police Power.
- 158s. Government and Business.
- 159w. Law of Public Utilities.

PSYCHOLOGY

See bulletin of College of Science, Literature, and the Arts.

- 1f-6w. General Psychology for Business Students. Offered only to business and pre-business students.
- 56w. Psychology of Advertising.
- 60f. Employment Psychology.
- 64s. Vocational Psychology.
- 125f-126w. Psychology of Individual Differences.

PUBLIC UTILITIES

- 72f. Economics of Transportation.
- 73w. Railway Traffic and Rates.
- 74s. Transportation Problems. An intensive study of certain important problems such as valuation, public ownership, operation, and regulation.
- 153w. The Trust Problem.
- 154s. Public Utilities.
- 159w. Law of Public Utilities. (See Political Science 159.)
- 180f-181w-182s.† Senior Seminar. Section E. Public Utilities and Transportation.

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

STATISTICS

- 14s. Elements of Statistics. Agricultural students see Economics 13, College of Agriculture bulletin.
- 112f. Business Statistics. Application of statistical methods in analyzing the internal and external aspects of business operations; internal aspects involving analysis of production, markets, etc., within business units; external aspects, dealing with general business conditions.
- 113w-114s. Theory of Statistics. The calculation and use of various constants of importance in the analysis of statistical data; averages, measures of dispersion and of correlation, partial correlation; and the theory of errors. Index numbers and analysis of time series.
- 180f-181w-182s.† Senior Seminar. Section F. Statistical Investigation.

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

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

The School of Business
Part II

Announcement of Program for the Year
1925-1926



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1925							1926																	
JULY							JANUARY							JULY										
Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa	Su	Mo	Tu	W	Th	Fr	Sa				
..	1	2	3	4	1	2	1	2	3				
5	6	7	8	9	10	11	3	4	5	6	7	8	9	4	5	6	7	8	9	10				
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..	31				
AUGUST							FEBRUARY							AUGUST										
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23	24	25	26	27	28	29	28	22	23	24	25	26	27	28				
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SEPTEMBER							MARCH							SEPTEMBER										
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27	28	29	30	28	29	30	31	26	27	28	29	30				
..				
OCTOBER							APRIL							OCTOBER										
..	4	5	6	7	8	9	10	1	..	4	5	6	7	8	9	10	..	3	4	5	6	7	8	9
11	12	13	14	15	16	17	11	12	13	14	15	16	17	10	11	12	13	14	15	16				
18	19	20	21	22	23	24	18	19	20	21	22	23	24	17	18	19	20	21	22	23				
25	26	27	28	29	30	31	25	26	27	28	29	30	..	24	25	26	27	28	29	30				
..	31				
NOVEMBER							MAY							NOVEMBER										
..	1	2	3	4	5	6	7	..	2	3	4	5	6	7	8	..	7	8	9	10	11	12	13	
8	9	10	11	12	13	14	9	10	11	12	13	14	15	14	15	16	17	18	19	20				
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29	30	30	31				
DECEMBER							JUNE							DECEMBER										
..	6	7	8	9	10	11	12	..	6	7	8	9	10	11	12	..	5	6	7	8	9	10	11	
13	14	15	16	17	18	19	13	14	15	16	17	18	19	12	13	14	15	16	17	18				
20	21	22	23	24	25	26	20	21	22	23	24	25	26	19	20	21	22	23	24	25				
27	28	29	30	31	27	28	29	30	26	27	28	29	30	31	..				
..				

UNIVERSITY CALENDAR

1925-26

September	17	Thursday	Payment of fees closes, except for new students
September	17-19		Entrance examinations
September	21-25		Examinations for removal of conditions Physical examinations for all new students
September	24-25		Registration period, ² colleges of Science, Literature, and the Arts, and Education
September	25	Friday	Registration days ² for all colleges not included above Payment of fees for new students closes

FALL QUARTER

September	28	Monday	Fall quarter begins, 8:30 ¹ a.m. First semester extension classes ³ begin
October	15	Thursday	Senate meeting, 4:30 p.m.
November	11	Wednesday	Armistice Day; a holiday
November	14	Saturday	Homecoming Day
November	26	Thursday	Thanksgiving Day; a holiday
December	3	Thursday	State Day Convocation
December	16-19		Final examination period
December	17	Thursday	Commencement Convocation Senate meeting, 4:30 p.m.
December	19	Saturday	Fall quarter ends, Christmas vacation begins, 5:20 p.m.
December	23	Wednesday	Payment of fees closes for all students in residence fall quarter ⁴

WINTER QUARTER

December	31	Thursday	} Registration days for new students in all colleges
January	2	Saturday	
January	4	Monday	Christmas vacation ends, winter quarter begins, 8:30 ¹ a.m.
January	30	Saturday	First semester extension classes close
February	1	Monday	Second semester extension classes begin ³

¹ First hour classes begin at 8:00 in the Medical School and 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 2.

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 and peculiar circumstances shall justify the appropriate committee of the college concerned permitting registration at a later date.

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

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

SCHOOL OF BUSINESS

February	12	Friday	Lincoln's Birthday; a holiday
February	18	Thursday	Charter Day Convocation Senate meeting, 4:30 p.m.
March	17-20		Final examination period
March	18	Thursday	Payment of fees closes for all students in residence winter quarter ²
March	20	Saturday	Winter quarter ends, spring vacation begins, 5:20 p.m.

SPRING QUARTER

March	26-27		Registration days for new students in all colleges
March	29	Monday	Spring vacation ends, spring quarter be- gins, 8:30 ¹ a.m.
April	2	Friday	Good Friday; a holiday
May	13	Thursday	Cap and Gown Day Convocation
May	20	Thursday	Senate meeting, 4:30 p.m.
May	29	Saturday	Second semester extension classes close
June	9-12		Final examination period
June	12	Saturday	Spring quarter closes, 5:20 p.m.
June	13	Sunday	Baccalaureate service
June	14	Monday	Fifty-fourth annual commencement

SUMMER SESSION

June	18-19		Summer Session first term begins, regis- tration and payment of fees
June	21	Monday	Classes begin, 8:00 a.m.
July	31	Saturday	Registration and payment of fees for second term closes
			First term Summer Session closes
August	2	Monday	Second term classes begin
September	4	Saturday	Second term Summer Session closes

¹ First hour classes begin at 8:00 in the Medical School and at 8:15 at University Farm.

² New students must pay fees on dates announced for registration.

THE SCHOOL OF BUSINESS

THE COURSES OF STUDY

Students who have completed with a C average one of the two-year pre-business programs or its equivalent are eligible for admission to the junior class of the School of Business. However, students entering from other institutions of recognized standing may be admitted if deficient in not more than two of the following: accounting, psychology, statistics, provided (1) that at least 90 credits and 90 honor points have been granted by the University examiner for the work done elsewhere, (2) that the deficiency be removed during the first year in the School of Business.

In the School of Business stress is laid upon the adaptation of the curriculum to the future plans of the individual. In order to make this aim effective each student is assigned to an adviser who makes a study of his needs and helps him to frame a program which will most nearly meet them.

The programs of study here given will therefore be varied as each particular case dictates. In some cases the student will be advised to elect one or more subjects in other schools and colleges of the University in order to obtain a well-rounded preparation for his prospective career.

I. THE GENERAL COURSE IN BUSINESS

Adviser, Mr. O'Hara and others

This course is recommended to those persons who desire a well-balanced training in the important fields of business education or for those who are not yet able to decide upon a specialized field of study.

JUNIOR YEAR

	Credits
Industrial Organization (Economics 89).....	3
The Financial System (Economics 143-144).....	8
Business Law (Economics 51-52-53)	9
Principles of Marketing (Economics 85)	3
Corporation Finance (Economics 155)	3
Electives (See list below)	16 to 25

SENIOR YEAR

	Credits
Cost Accounting (Economics 130)	3
Labor Problems (Economics 161)	3
Business Cycles (Economics 149)	3
Advanced General Economics (Economics 101-102).....	6
Economics of Transportation (Economics 72)	3
Personnel Administration (Economics 167)	3
Geography of Commercial Production (Geog. 61).....	5
Electives (See list below)	16 to 25

SCHOOL OF BUSINESS

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Investments	3
Advanced Personnel Administration	3
Advanced General Accounting	3
Accounting Practice and Procedure	6
Government and Business	3
Property Insurance	3
Public Finance	6
Advanced English Composition	9
Agricultural Economics	3
The Trust Problem	3
Commercial Policies	3
Railway Traffic and Rates	3
Economics of Agricultural Production	3
Office Management	3
Life Insurance	3
Marketing of Farm Products	3
Police Power	3
Foreign Exchange	3

II. ACCOUNTING

Adviser, Mr. Heilman

The program in accounting is designed to meet the needs of those persons who are preparing for public accounting, the teaching of accounting, or for positions as accountants in financial or business establishments.

JUNIOR YEAR

	Credits
Cost Accounting (Economics 131-132-133)	9
Accounting Practice and Procedure (Economics 137-138)....	6
Advanced General Accounting (Economics 139).....	3
Business Law (Economics 51-52-53)	9
Financial System (Economics 143-144)	8
Corporation Finance (Economics 155)	3
Electives (See list below)	4 to 13

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102).....	6
Business Cycles (Economics 149)	3
Income Tax Accounting (Economics 134)	3
Auditing (Economics 135-136)	6
Accounting Seminar (Economics 181-182-183)	9
Electives (See list below)	15 to 24

COURSES OF STUDY

7

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Industrial Organization	3
Commerce Algebra	5
Mathematics of Investment	5
Government and Business	3
Public Finance	6
State and Local Taxation	3
Principles of Marketing	3
Office Management	3
Investments	3
Property Insurance	3
Business Statistics	3
Advanced English Composition	9

III. AGRICULTURAL BUSINESS

Adviser, Mr. Black

This line of specialization is intended for students, who wish to prepare for some branch of business which relates to agriculture, such as the marketing of farm products, farm finance, farm implements, farm real estate, country merchandising, and the like. The student should also take supplementary courses in technical agriculture: It is recommended that as many as possible of these be taken during the pre-business years. One hundred ninety-two credits are required for graduation from this course.

JUNIOR YEAR

	Credits
Economics of Agricultural Production (Economics 110-111) ..	6
Principles of Marketing Organization (Agricultural Economics 140)	3
Prices of Farm Products (Agricultural Economics 130)	3
Agricultural Statistics (Agricultural Economics)	5
Business Law (Economics 51-52-53)	9
Marketing Organization: Semi-Perishables (Agricultural Economics 141)	3
Marketing Organization: Perishables (Agricultural Economics 142)	3
Market Prices (Agricultural Economics 131)	3
The Financial System (Economics 143-144)	8

SENIOR YEAR

	Credits
Principles of Co-operation (Agricultural Economics 144) ..	3
Advanced General Economics (Economics 101-102)	6
Economics of Transportation (Economics 72)	3
Railway Traffic and Rates (Economics 73)	3
Business Cycles (Economics 149)	3
Methods of Forecasting Prices (Agricultural Economics 135) ..	3
Advanced Farm Finance (Agricultural Economics 161)	3
Land Economics (Agricultural Economics 170)	3

SCHOOL OF BUSINESS

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Business Statistics	3
Theory of Statistics	3
Corporation Finance	3
Commercial Policies	6
Public Finance	6
Marketing Management	6
Farm Management II: Organization	3
Farm Management II: Operation	3

IV. BANKING

Adviser, Mr. Stehman

This program is designed for persons who expect to become connected with banks and bond houses.

JUNIOR YEAR

	Credits
The Financial System (Economics 143-144).....	8
Corporation Finance (Economics 155)	3
Business Law (Economics 51-52-53)	9
Electives (See list below)	22 to 31

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102).....	6
Bank Administration (Economics 147)	3
Advanced Corporation Finance (Economics 156)	3
Investments (Economics 146)	3
Business Cycles (Economics 149)	3
Foreign Exchange (Economics 145)	3
Finance Seminar (Economics 180-181-182)	9
Electives (See list below)	12 to 21

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Industrial Organization	3
Advanced Farm Finance	3
Cost Accounting	3
Public Finance	6
State and Local Taxation	3
Economics of Transportation	3
Advanced English Composition	9
Foreign Trade	3
Commercial Policies	3
Principles of Marketing	3
Geography	5-9
Land Economics	5
Agricultural Economics	3
Life Insurance	3
Business Statistics	3
The Trust Problem	3

V. FOREIGN TRADE

Adviser, Mr. Blakey

This course is designed for persons who plan to associate themselves with exporting houses or with export departments of large manufacturing and mercantile establishments.

JUNIOR YEAR

	Credits
The Financial System (Economics 143-144)	8
Principles of Marketing (Economics 85)	3
Economics of Transportation (Economics 72)	3
Railway Traffic and Rates (Economics 73)	3
Psychology of Advertising (Psychology 56)	3
Foreign Exchange (Economics 145)	3
Advertising (Economics 88)	3
Transportation Problems (Economics 74)	3
Geography of Commercial Production (Geography 61).....	5
Electives (See list below)	7 to 17

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102).....	6
Business Law (Economics 51-52-53)	9
Commercial Policies (Economics 176)	3
International Law (Economics 121-122)	6
Foreign Trade (Economics 177)	3
Business Cycles (Economics 149)	3
Electives (See list below)	12 to 21

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Industrial Organization	3
Foreign Languages .....	..
Public Finance	6
Comparative European Government.....	5
Personnel Administration	3
Advanced Personnel Administration	3
Economics of Agricultural Production	3
Property Insurance	3
Business Statistics	3
Advanced English Composition	9

VI. PERSONNEL MANAGEMENT

Adviser, Mr. Paterson

This program offers basic training to (1) prospective heads of personnel departments in business establishments, or of subdivisions thereof, and (2) to persons who expect to participate as trained experts in the adjustment of matters pertaining to the employment of labor.

SCHOOL OF BUSINESS

JUNIOR YEAR

	Credits
Labor Problems and Trade Unionism (Economics 161).....	3
Labor Movement in America (Economics 162)	3
Labor and Socialist Movement in Europe (Economics 169)..	3
Business Law (Economics 51-52-53)	9
The Financial System (Economics 143-144).....	8
Principles of Marketing (Economics 85)	3
Industrial Organization (Economics 89)	3
Personnel Administration (Economics 167)	3
Advanced Personnel Administration (Economics 168).....	3
Corporation Finance (Economics 155)	3
Electives (See list below)	3 to 9

SENIOR YEAR

	Credits
Business Statistics (Economics 112)	3
Social Insurance (Economics 62)	3
Business Cycles (Economics 149)	3
Advanced General Economics (Economics 101-102).....	6
Psychology in Personnel Work (Psychology 60).....	3
Introduction to Administration (Political Science 130).....	3
Principles of Public Administration (Political Science 131)..	3
Vocational Psychology (Psychology 130)	2
Electives (See list below)	17 to 20

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Introduction to Anthropology	5
Psychology of Individual Differences	6
Theory of Statistics	3
Cost Accounting	3
Office Management	3
Introduction to Sociology	5
Advanced English Composition	9

VII. MERCHANDISING

Adviser, Mr. Vaile

The subjects specified in this program are sufficiently fundamental and the freedom of election sufficiently great to include preparation for manufacturing, wholesaling, and retailing businesses.

JUNIOR YEAR

	Credits
The Financial System (Economics 143-144).....	8
Principles of Marketing (Economics 85)	3
Business Law (Economics 51-52-53)	9
Business Statistics (Economics 112)	3
Theory of Statistics (Economics 113)	3
Corporation Finance (Economics 155)	3
Advertising (Economics 88)	3
Psychology of Advertising (Psychology 56)	3
Electives (See list below)	7 to 16

COURSES OF STUDY

11

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102).....	6
Economics of Transportation (Economics 72).....	3
Railway Traffic and Rates (Economics 73)	3
Transportation Problems (Economics 74)	3
Commercial Policies (Economics 176)	3
Marketing Organizations: Agricultural Products (Economics 108)	3
Business Cycles (Economics 149)	3
Marketing Seminar (Economics 180-181-182)	9
Electives (See list below)	7 to 18

RECOMMENDED ELECTIVES

	Hours
Economic History	3 to 6
Employment Psychology	3
Labor Problems	3
Principles of Co-operation	3
Logic	5
Cost Accounting	3
Industrial Organization	3
Foreign Trade	3
Personnel Administration	3
Vocational Psychology	3
Geography of Commercial Production	5
Prices of Farm Products	3

VIII. SECRETARIAL COURSE

Adviser, Miss Leonard

The courses offered in this program are arranged for the training of secretaries and assistants. The student should select, with the help of his adviser, the courses which will best prepare him for the special type of secretarial work he expects to enter. Among the positions for which he may prepare are: office manager and assistant; private secretary to persons engaged in educational, social, philanthropic, scientific, medical, legal, religious, literary, professional, or mercantile work; secretary in schools and institutions; business correspondent; registrar; teacher of commercial branches; Civil Service.

JUNIOR YEAR

	Credits
Secretarial Training (Economics 94-95-96)	15
The Financial System (Economics 143-144).....	8
Business Law (Economics 51-52-53)	9
Rhetoric 18-19 (Types of Writing).....	6
Corporation Finance (Economics 155)	3
Electives (See list below)	7 to 16

SENIOR YEAR

	Credits
Advanced Secretarial Training (Economics 97-98-99).....	15
Advanced General Economics (Economics 101-102)	6
Office Organization and Management (Economics 86).....	3
Business Cycles (Economics 149)	3
Senior Seminar in Secretarial Practice (Economics 70-71)..	6
Electives (See list below)	9 to 18

SCHOOL OF BUSINESS

RECOMMENDED ELECTIVES

	Hours
Life Insurance	3
Social Insurance	3
Principles of Marketing	3
Economics of Transportation	3
Advertising	3
Business Statistics	3
Investments	3
Economic History	3 to 6
Cost Accounting	3
Accounting Practice and Procedure	6
Advanced General Accounting	3
Labor Problems and Trade Unionism	3
Personnel Management	3
Commercial Policies	3
Geography of Commercial Production	5
American Government	5
Government and Business	3
Public Speaking	3 to 10

IX. INDUSTRIAL ADMINISTRATION

Adviser, Mr. O'Hara

This course follows the two-year pre-business course given in the College of Engineering. The program is designed primarily for students who wish to engage in purchasing, sales, employment, or cost accounting work in manufacturing establishments.

JUNIOR YEAR

	Credits
Principles of Marketing (Economics 85)	3
Business Law (Economics 51-52-53)	9
Mechanism of Exchange (Economics 3)	5
Railway Traffic and Rates (Economics 73)	3
Corporation Finance (Economics 155)	3
Business Cycles (Economics 149)	3
Elements of Statistics (Economics 14)	5
Industrial Organization (Economics 89)	3
Electives (See list below)	9 to 19

SENIOR YEAR

	Credits
Advanced General Economics (Economics 101-102)	6
Cost Accounting (Economics 131-132-133)	9
Monetary and Banking Policy (Economics 141)	3
Labor Problems (Economics 161)	3
Personnel Administration (Economics 167)	3
Advanced Personnel Administration (Economics 168)	3
Electives (See list below)	20 to 24

RECOMMENDED ELECTIVES

Students are expected to divide the time available for electives between groups A and B.

COURSES OF STUDY

A. General and Business

	Hours
Economic History	3 to 6
Psychology (1 and 6)	6
Business Statistics	3
Theory of Statistics	3
Accounting Practice and Procedure	6
Advanced General Accounting	3
Geography of Commercial Production	5

B. Engineering

Gas Manufacturing and Distribution	3
Municipal Engineering	3
Contracts and Specifications	3
Estimating	3
Technical Writing	3
Industrial Management	9
Safety Engineering	3

PROGRAM*

1925-26

No.	Title	Hour	Day	Bldg.	Instructor
1f-2w†	Introduction to Economics				
	(10 cred.; pre-bus. fr.; prereq., none)				
	Lect.	III	TTh	OLAud	Mr. Black
	Sec. 1	I	TThS	6B	and others
	2	I	TThS	106B	
	3	II	TThS	213B	
	4	II	TThS	209B	
	5	I	MWF	109B	
	6	II	MWF	209B	
	7	III	MWF	213B	
	(Sections 8	III	MWF	6B	
	limited 9	IV	MWF	106B	
	to 25 10	V	MWF	109B	
	students 11	VI	MWF	109B	
	each) 12	VI	MWF	6B	
	13	VII	MWF	109B	
	14	VII	MWF	209B	
	15	VIII	MWF	202B	
	16	VIII	MWF	6B	
35	The Mechanism of Exchange.....				
	(5 cred.; pre-bus. fr., and majors in				
	economics; no prereq.)				
	Lect.	III	TTh	OLAud	Mr. Dowrie
	Sec. 1	I	TThS	6B	and others
	2	I	TThS	102B	
	3	II	TThS	102B	
	4	II	TThS	213B	
	5	III	MWF	213B	
	6	IV	MWF	109B	
	7	IV	MWF	106B	
	8	V	MWF	202B	
	9	VI	MWF	109B	
	10	VI	MWF	202B	
4f‡	Principles of Economics—Pre-business...				Mr. Hansen
	(5 cred.; soph., pre-bus. only; prereq.,				and others
	1-2)				
	Lect.	II	T	MuAud	
	Sec. 1	I	TThFS	213B	
	(Sections 2	II	MWFS	202B	
	limited 3	II	MWFS	6B	
	to 25 4	III	TThFS	109B	
	students 5	IV	MWFS	213B	
	each) 6	V	MTWF	202B	
	7	VI	MWThF	102B	
	8	VII	MWThF	6B	

* Each course has in parentheses an abbreviated statement of credits and prerequisites. Thus (5 cred.; jr., sr., grad.; prereq., 3-4) means that the course carries 5 credits, is offered to juniors, seniors, and graduates, and demands Course 3-4 in the same department as a prerequisite.

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

‡ Open to pre-business students only.

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
4w*	Principles of Economics—Pre-business.. (See 4f)				Mr. Hansen and others
	Lect.	II	T	MuAud	
	Sec. 1	II	MWFS	109B	
	(Sections limited to 25 students each)	2	IV	MWFS	109B
		3	V	MTWF	102B
		4	VI	MWThF	202B
4s*	Principles of Economics—Pre-business.. (See 4f)				Mr. Hansen and others
	(Sections limited to 25 students each)				
	Lect.	II	T	202B	
	Sec. 1	I	TThFS	109B	
	2	III	TThFS	6B	
	3	VI	MWThF	6B	
6w-7s§	Principles of Economics—General Course				See Science, Literature, and Arts bulletin
6s-(7f)§	Principles of Economics—General Course				See Science, Literature, and Arts bulletin
(6s)-7f††	Principles of Economics—Old course... (Sections limited to 25 students each)				Mr. Hansen and others
	Lect.	II	Th	301F	
	Sec. 1	II	MWFS	109B	
	2	III	MWFS	106B	
	3	IV	MWFS	6B	
	4	V	MTWF	6B	
8f-9w-10s	General Economics				See College of Engineering bulletin
14s	Elements of Statistics				
	(5 cred.; soph., jr., sr.; prereq., 4 or 6-7)				
	Lect.	III	MW	OLAud	Mrs. Kittredge and others
	Sec. 1	I-II	MW	301B	
	2	I-II	ThS	301B	
	(Limited to 25 students each)	3	III-IV	TS	301B
		4	VI-VII	WF	301B
		5	VI-VII	TTh	301B
		6	VIII-IX	WF	301B
		7	VIII-IX	TTh	301B
		8	{ VI-VII	M	301B
			{ I-II	F	301B
		9	{ VIII-IX	M	301B
			{ III-IV	F	301B
25f-26w†	Principles of Accounting				
	(8 cred.; soph., jr., sr.; no prereq.)				
	Lect. Sec. 1	I	MWF	301B	Mr. Heilman and others
	2	I	TThS	301B(f)	
	3	II	MWF	301B	
	4	II	TThS	301B	
	5	III	MWF	301B(f)	

* Open to pre-business students only.

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

() Numbers in parentheses do not refer to the year 1925-26.

§ Not open to pre-business students.

† Second quarter of Course 6-7 as offered in 1924-25.

SCHOOL OF BUSINESS

No.	Title	Hour	Day	Bldg.	Instructor
	(Limited 6	III	TThS	301B	
	to 30 7	IV	MWF	301B(f)213B(w)	
Both lecture	each) 8	V	MWF	301B(f)	
and labora-	9	VI	MWF	301B	
tory must be	10	II	MWF	303B(f)213B(w)	
taken in order	Lab. Sec. 1	VI-VII	M	303B	
to receive	2	I-II	T	302B	
credit for	3	VI-VII	W	303B(f)	
this course.	4	VI-VII	Th	303B	
	5	VI-VII	F	303B	
	6	VII-VIII	M	301B	
	7	VII-VIII	T	301B(f)	
	8	VII-VIII	W	301B	
	(Limited 9	VII-VIII	Th	301B	
	to 18 10	VII-VIII	F	301B(f)	
	each) 11	VIII-IX	T	303B	
	12	VIII-IX	W	303B(f)	
	13	III-IV	T	303B	
	14	II-III	Th	302B	
	15	III-IV	S	303B	
	16	III-IV	F	302B	
25w-26s†	Principles of Accounting				
	Lect. Sec. 1	II	MWF	303B	Mr. Heilman
	2	I	TThS	303B	and others
	3	III	MWF	303B	
	4	IV	MWF	301B(w)302B(s)	
	5	VI	MWF	302B(w)	
	Lab. Sec. 1	VI-VII	T	303B	
	2	III-IV	W	302B(w)301B(s)	
	3	VIII-IX	M	303B	
	4	VIII-IX	W	303B	
	5	II-III	S	302B	
	6	VII-VIII	F	301B(w)303B(s)	
	7	VI-VII	W	303B	
	8	VII-VIII	T	301B(w)	
29f	Principles of Accounting	See	College of Engineering	bulletin	
51f-52w-53s†	Business Law	See	Political Science	51-52-53	
59f	Life Insurance	III	TThS	102B	Mr. Graves
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
60w	Property Insurance	III	TThS	102B	Mr. Graves
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
62s	Social Insurance	III	TThS	102B	Mr. Graves
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
63w	Colonization	See	Political Science	65	
70f-71w†	Senior Seminar in Secretarial Practice..	IV	MWF	1B	Miss Leonard
	(6 cred.; sr.; prereq., 94-95-96)				
72f	Economics of Transportation				
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
	(Section limited Sec. 1	VI	MWF	202B	Mr. Cum-
	to 30 students) 2	VII	MWF	202B	mings
72w	Economics of Transportation	VI	MWF	102B	
	(3 cred.; jr., sr.; prereq., 4 or 6-7)				
	(Section limited				
	to 30 students)				

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
72s	Economics of Transportation (3 cred.; jr., sr.; prereq., 4 or 6-7) (Section limited to 30 students)	VII	MWF	202B	Mr. Cummings
73w	Railway Traffic and Rates (3 cred.; jr., sr.; prereq., 4 or 6-7)	VII	MWF	102B	Mr. Cummings
74s	Transportation Problems (3 cred.; jr., sr.; prereq., 72)	VI	MWF	102B	Mr. Cummings
80f-81w	Introduction to Economic History	See History 80-81			
82f-83w-84s	Economic History of the United States	See History 82-83-84			
85f	Principles of Marketing (3 cred.; jr., sr.; prereq., 4 or 6-7)				
	Lect.	I		T 202B	Mr. Vaile
	Sec. 1	I		ThS 202B	
	2	1		WF 209B	
	3	III		ThS 213B	
85s	Principles of Marketing (3 cred.; jr., sr.; prereq., 4 or 6-7)				
	Lect.	I		T 202B	Mr. Vaile
	Sec. 1	I		ThS 202B	
	2	1		WF 209B	
	3	III		ThS 213B	
86s	Office Organization and Management... (3 cred.; jr., sr.; prereq., 4 or 6-7)	IV	MWF	1B	Miss Leonard
88s	Advertising (3 cred.; jr., sr.; prereq., 85, Psy. 156)	III	MWF	109B	Mr. Vaile
89f	Industrial Organization (3 cred.; jr., sr.; prereq., 4 or 6-7)	I	TThS	109B	Mr. O'Hara
89s	Industrial Organization (3 cred.; jr., sr.; prereq., 4 or 6-7)	1	MWF	102B	Mr. O'Hara
90s	Economics of Consumption	See Agricultural Economics 126			
91w	Principles of Organization and Management	See College of Engineering bulletin			
92s	Business Finance for Engineers.....	See College of Engineering bulletin			
93s	Cost Accounting for Engineers.....	See College of Engineering bulletin			
94f-95w-96s	Secretarial Training (15 cred.; jr., sr.; prereq., 4 or 6-7)	VI-VII	MTW		
			ThF	1B	Miss Leonard
97f-98w-99s†	Advanced Secretarial Training (15 cred.; sr.; prereq., 94-95-96)	Ar	Ar	1B	Miss Leonard
101f-102w†	Advanced General Economics (6 cred.; sr.; prereq., 4 or 6-7)				
	Sec. 1	I		MWF 102B	Mr. Garver
	2	III		MWF 102B	
	3	IV		MWF 102B	
103f-104w†	Value and Distribution	See Science, Literature, and Arts bulletin			
105s	History of Economic Ideas—The Classical Economists (3 cred.; jr., sr., grad.; prereq., 103-104)	(Not offered in 1925-26)			
106s	History of Economic Ideas—The Critics of the Classical Economists..... (3 cred.; jr., sr., grad.; prereq., 105 or permission of instructor)	IV	MWF	202B	Mr. Hansen
108w*	Marketing Organization: Agricultural Products (3 cred.; jr., sr., grad.; prereq., 85; not open to agric. bus. students)	VIII	MWF	102B	Mr. Price

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

* Section on main campus.

No.	Title	Hour	Day	Bldg.	Instructor
110f-111w	Economics of Agricultural Production..	See	Agricultural	Economics	110-111
112f	Business Statistics	I	MWF	6B	Mrs. Kittredge
	(3 cred.; jr., sr., grad.; prereq., 14)				
113w-114s	Theory of Statistics	I	MWF	6B	Mrs. Kittredge
	(6 cred.; jr., sr., grad.; prereq., 14)				
118f-119w-120s†	Economic History of Europe, 1750 to the Present	See	History	113-114-115	
121f-122w-123s†	Economic History of Europe, 1300-1750	See	History	116-117-118	
126s	Economics of Consumption.....	See	Agricultural Economics	126	
130f	Cost Accounting (General survey).....	III	TThS	6B	Mr. Ostlund
	(3 cred.; sr., grad.; prereq., 25-26)				
131f-132w-133s†	Cost Accounting	II	TThS	303B	Mr. Ostlund
	(9 cred.; jr., sr., grad.; prereq., 25-26)				
134f	Income Tax Accounting	II	MWF	302B	Mr. Reighard
	(3 cred.; jr., sr., grad.; prereq., 137-138- 139)				
135w-136s†	Auditing	II	MWF	302B	Mr. Reighard
	(6 cred.; jr., sr., grad.; prereq., 134)				
137f-138w†	Accounting Practice and Procedure....	IV	MWF	303B	Mr. Heilman
	(6 cred.; jr., sr., grad.; prereq., 25-26)				
139s	Advanced General Accounting.....	IV	MWF	303B	Mr. Heilman
	(3 cred.; jr., sr., grad.; prereq., 25-26)				
143f-144w†	The Financial System				
	(8 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
	Lect.	III	W	MuAud	Mr. Dowrie and others
	Sec. 1	VIII	MTW	209B	
	2	II	MWF	106B	
	3	II	MWF	102B	
	4	II	TThS	106B	
	5	III	TThS	209B	
	6	III	TThS	202B(f), 109B(w)	
	7	V	MWF	209B	
	8	VI	MWF	209B	
143w-144s†	The Financial System				Mr. Dowrie, Mr. Farmer
	(8 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
	Lect.	IV	S	202B	
	Sec. 1	II	MWF	104B(w) 209B(s)	
	2	IV	MWF	104B	
	3	VII	MWF	202B(w) 102B(s)	
145s	Foreign Exchange	IV	MWF	102B	Mr. Myers
	(3 cred.; jr., sr., grad.; prereq., 143-144)				
146f	Investments	IX	MTW	202B	Mr. Ebersole
	(3 cred.; jr., sr., grad.; prereq., 155, 143-144)				
147s	Bank Administration	IX	MTW	202B	Mr. Ebersole
	(3 cred.; jr., sr., grad.; prereq., 143-144)				
149w	Business Cycles				
	(3 cred.; sr., grad.; prereq., 143-144)				
	Sec. 1	IX	MTW	202B	Mr. Ebersole
	2	III	MWF	202B	Mr. Myers

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

PROGRAM

No.	Title	Hour	Day	Bldg.	Instructor
149S	Business Cycles				
	(3 cred.; sr., grad.; prereq., 143-144)				
	Sec. 1	VIII	MTW	202B	Mr. Ebersole
	2	III	MWF	102B	Mr. Myers
150S	Advanced Farm Finance	VI-VII	W	104B	Mr. Myers
	(3 cred.; sr., grad.; prereq., 143-144)				
151f	Prices of Farm Products.....		See Agricultural	Economics 130	
153W	The Trust Problem	II	MWF	202B	Mr. Stehman
	(3 cred.; jr., sr., grad.; prereq., 155)				
154S	Public Utilities	II	MWF	102B	Mr. Garver
	(3 cred.; jr., sr., grad.; prereq., 20 cred. in soc. sci. incl. 4 or 6-7)				
155S	Corporation Finance				
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
	Lect.	III	Th	301F	Mr. Stehman and others
	Sec. 1	II	MW	109B	
	2	III	MW	6B	
	3	III	MW	202B	
	4	IV	MW	209B	
	5	VI	TTh	102B	
	6	VII	TTh	102B	
156f	Advanced Corporation Finance.....				
	(3 cred.; jr., sr., grad.; prereq., 155)				
	Sec. 1	I	TThS	102B	Mr. Stehman
	2	II	TThS	102B	
157f	Police Power		See Political Science	157	
158S	Government and Business		See Political Science	158	
159W	The Law of Public Utilities.....		See Political Science	159W	
161f	Labor Problems and Trade Unionism..				
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
	Lect.	IV	MW	202B	Mr. Hansen
	Sec. 1	IV	F	202B	
	2	IV	F	109B	
	3	II	F	213B	
161W	Labor Problems and Trade Unionism..	III	TThS	202B	Mr. Hansen
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
162W	Labor Movement in America and Eng-land	IV	MWF	202B	Mr. Hansen
	(3 cred.; jr., sr., grad.; prereq., 161)				
163W	Economic Aspects of Population and Immigration		(Not offered in 1925-26)		
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
167W	Personnel Administration				
	(3 cred.; jr., sr., grad.; prereq., 161)				
	Sec. 1	II	TThS	202B	Mr. Stead
	2	III	TThS	213B	
168S	Advanced Personnel Administration ...	II	TThS	209B	Mr. Stead
	(3 cred.; jr., sr., grad.; prereq., 167)				
169S	Labor and Socialist Movement in Europe		(Not offered in 1925-26)		
	(3 cred.; jr., sr., grad.; prereq., 161)				

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

SCHOOL OF BUSINESS

No.	Title	Hour	Day	Bldg.	Instructor
1708	Land Economics (3 cred.; jr., sr., grad.; prereq., 4 or 6-7)	VII-VIII½	TTh	209B	Mr. Black
1718	Land Tenure	See Agricultural Economics 171			
1728	Economic History of the United States since the Civil War	(Not offered in 1925-26)			
176f	Commercial Policies	I	MWF	202B	Mr. Blakey
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
1768	Commercial Policies	I	MWF	202B	Mr. Blakey
	(3 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
177W	Foreign Trade	I	MWF	202B	Mr. Blakey
	(4 cred.; jr., sr., grad.; prereq., 176)				
180f-181W-182s†	Senior Seminar				
	(9 cred.; School of Business seniors)				
	A. Accounting	V½-VI	TTh	302B	
	B. Business Finance	VII-VIII	T	213B	
	C. Marketing	VI-VII	TTh	104B	
191f-192w†	Public Finance				
	(6 cred.; jr., sr., grad.; prereq., 4 or 6-7)				
	Sec. 1	III	MWF	209B	Mr. Blakey
	2	IV	MWF	209B	
1938	State and Local Taxation.....	III	MWF	209B	Mr. Blakey
	(3 cred.; jr., sr., grad.; prereq., 191-192)				
203f-204W-205s†	Seminar in Economic Theory.....	VIII½-IX	TTh	104B	Mr. Garver
	(9 cred.; grad.; prereq., 103-104)				
210f-211W-212S	Seminar in Labor	Ar	Ar	Ar	Mr. Hansen
	(9 cred.; grad.; prereq., 161)				
219f-220W-221s†	Seminar in Agricultural Economics....	See College of Agriculture bulletin			
243f-244W-245S	Seminar in Private Finance	VIII-IX	M	104B	Mr. Dowrie
	(6 cred.; grad.; prereq., 143-144 or equiv.)				

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

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

General Extension Division
Announcement of Extension Classes
1925-1926



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Extension Calendar

In case a class observes other holidays than those here shown, the sessions missed are to be made up by extra meetings within the semester limits.

1925			Registration
September	21-26		First semester begins
September	28	Monday	
November	26	Thursday	Thanksgiving Day; a holiday
December	24	Thursday	Christmas recess begins
1926			
January	4	Monday	Class work resumed
January	25-29		Examinations, first semester classes
February	1	Monday	Second semester begins
May	24-28		Examinations, second semester classes

Attention is called to the fact that the campus office of the General Extension Division has been removed from the Main Engineering Building to the fourth floor of the new Administration Building, on southeast State Street. A contact office, where information may be sought and bulletins or other printed material obtained, will be maintained on the first floor.

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Opportunities through Extension Work

In his famous lecture, "Acres of Diamonds," Dr. Russell H. Conwell tells the story of Ali Hafed, an ancient Persian of great wealth, who sold his farm and other possessions at a sacrifice that he might go forth in search of a diamond mine, expecting thus to win even greater wealth and power than he had previously enjoyed. His search was in vain—and his experience all the more bitter because of the fact that, in the dooryard of his former possessions, diamonds of untold value were found by his successor.

Today we measure our "Acres of Diamonds" in terms of opportunity, which grows out of training and experience. And everyone owes it to himself or herself to secure this training, which is within the reach of all who are willing to avail themselves of it.

It is the function of the General Extension Division of the University of Minnesota to bring the benefits of university training to *all* citizens of Minnesota, including those who, for one reason or another, cannot take advantage of the instruction offered on the university campus. By this means, the University seeks to measure up to its full responsibility to the people of the state, who have built the University and who now support it.

There are many people to whom extension work opens an opportunity which otherwise they would lack. There are public school and high school teachers who wish to keep abreast of new developments in the work they are doing. There are industrial workers who must make a living, but who are anxious to devote spare time to training for advancement. There are business men and women who realize the advantages of a thorough training in the principles and practice of modern business, but who cannot give up their positions in order to pursue a full time vocational course. It is to serve these groups, as well as those who wish for further study with a view merely to self-development and culture, that the University has created the Extension Division.

The General Extension Division is prepared to organize and conduct late afternoon and evening classes in any community

in the state where there is sufficient demand. For several years classes have been conducted in Minneapolis, St. Paul, Duluth, Brainerd, and at other points. The director of General Extension will welcome the opportunity to co-operate with other communities in a similar way.

Such extension classes include:

1. Courses leading to credit in the College of Science, Literature, and the Arts, in the College of Education, and in the School of Business. In extension classes of this nature many persons are completing a considerable part of the work required for a degree in the colleges mentioned.

2. Courses in business administration, accountancy, and finance. The student who so desires may arrange his work in such a way that he will be awarded an Extension Division certificate in accounting, banking and finance, or general business. Such certificates carry considerable weight in the business world, proving as they do the satisfactory completion of three years of university work in business subjects.

3. Practical courses in engineering and in industrial subjects. Certificates in engineering are awarded to students who complete satisfactorily three or four years of engineering study.

Full information regarding these courses may be found in this bulletin.

Other extension activities include correspondence courses in each of the three groups of subjects above, totaling about two hundred courses; and a Municipal Reference Bureau and Community Service Department (see last page of this bulletin).

General Extension Faculty

- Lotus Delta Coffman, Ph.D., LL.D., President
Richard Rees Price, M.A., Ed.D., Director of University Extension
Milton J. Anderson, B.S. in Arch., Instructor in Architecture, Duluth
Carlos Arjona, Ph.D., Assistant Professor of Romance Languages
Charles L. Bane, Ph.D., Assistant Professor of Psychology, General
Extension Division
Winfield W. Bardwell, LL.M., Judge of the Hennepin County District
Court, Instructor in Business Law.
Reuel R. Barlow, B.A., Instructor in Journalism
Frederic H. Bass, B.S., Professor of Municipal and Sanitary Engineering
William O. Beal, M.A., M.S., Instructor in Astronomy and Assistant
Astronomer
Adolph A. Blandin, B.S., Instructor in Accounting
Donald S. Bleifuss, B.S., Instructor in Mathematics
Charles Boehnlein, B.S., M.E., Instructor in Mathematics and Mechanics
Gisle C. Bothne, M.A., Professor of Scandinavian Languages and Litera-
tures
Ruth E. Boynton, B.S., M.D., Instructor in Preventive Medicine and
Public Health
William E. Brooke, B.C.E., M.A., Professor of Mathematics and Mechanics
J. William Buchta, M.A., Instructor in Physics
Samuel C. Burton, M.A., Assistant Professor of Architecture
Eula B. Butzerin, B.S., R.N., Instructor in Preventive Medicine and Public
Health
Jessie F. Caplin, Instructor in Textiles
George G. Chapin, B.A., LL.B., Instructor in Business Law
Mary Ellen Chase, Ph.D., Assistant Professor of English
Edward G. Cheyney, B.A., Professor of Forestry
Edwin L. Clarke, Ph.D., Assistant Professor of Sociology
Herbert E. Cleifton, M.A., Assistant Professor of Romance Languages
George P. Conger, Ph.D., Assistant Professor of Philosophy
Charles LeRoy Conley, B.A., Instructor in Business, General Extension
Division, Resident Manager in St. Paul
William H. Crago, Instructor in Geology
John J. Creamer, B.A., LL.B., Instructor in English
Chester C. Crellin, Instructor in Railway Traffic and Rates
William C. Culmer, B.A., Instructor in Accounting
Joseph E. Cummings, M.A., Assistant Professor of Economics
Alvin S. Cutler, C.E., Professor of Railway Engineering
James Davies, Ph.D., Assistant Professor of German
Darrel H. Davis, Ph.D., Associate Professor of Geology
Paul R. DeFreece, B.S. in C.E., Instructor in Mechanical Drawing
Harold S. Diehl, M.A., M.D., Assistant Professor of Preventive Medicine
and Public Health

- J. Franklin Ebersole, M.A., Professorial Lecturer in Economics
 Oliver C. Edwards, B.S., M.E., Assistant Professor of Mechanical Engineering, General Extension Division
 Manuel C. Elmer, Ph.D., Associate Professor of Sociology
 Lu Lester Everly, M.A., Instructor in Geography
 Donald N. Ferguson, M.A., Associate Professor of Music
 William L. Fichter, Ph.D., Assistant Professor of Romance Languages
 Ross L. Finney, Ph.D., Assistant Professor of Educational Sociology
 James H. Forsythe, M.A. in Arch., Associate Professor of Architecture
 William K. Foster, LL.M., M.D., Assistant Professor of Physical Education for Men
 Jules T. Frelin, B.A., Assistant Professor of Romance Languages
 Robert W. French, B.S. (C.E.), Assistant Professor of Drawing and Descriptive Geometry
 John S. Garns, B.A., Instructor in Public Speaking
 Isaac W. Geiger, Ph.D., Associate Professor of Chemistry
 George G. Glick, B.A., LL.B., Instructor in Business Law
 Richard A. Graves, M.A., Instructor in Economics
 J. Stanley Gray, M.A., Instructor in Public Speaking
 Robert Guinn, B.A., Instructor in Romance Languages
 Marguerite Guinotte, Brevet Supérieur, Certificat d'Aptitude Pédagogique, M.A., Instructor in Romance Languages
 Henry R. Halsey, B.S., Instructor in Investments
 Leah M. Hanley, B.S., Instructor in Art Education
 Oscar E. Harder, Ph.D., Professor of Metallography
 Samuel B. Harding, Ph.D., Professor of History
 Donald Harries, LL.B., Instructor in Business Law
 Edward W. Hawley, B.A., LL.M., Instructor in Parliamentary Law
 Ronald M. Hazen, B.S. (M.E.), Instructor in Mechanical Engineering
 Ernest A. Heilman, Ph.D., Assistant Professor of Accounting
 Louis B. Hessler, Ph.D., Assistant Professor of English
 Carl A. Herrick, M.E., Assistant Professor of Mathematics and Mechanics
 James T. Hillhouse, Ph.D., Assistant Professor of English
 William T. Holman, Ph.D., Professor of Mathematics and Mechanics
 Harvey Hoshour, B.A., LL.B., Instructor in Business Law
 G. Sidney Houston, Jr., Instructor in Accounting
 John A. Jacobson, Instructor in Accounting
 Edward J. Kenny, B.A., LL.B., Instructor in Business Law
 Paul C. King, B.A., Instructor in Romance Languages
 Alfred E. Koenig, M.A., Dr. Theol., Special Lecturer in Americanization
 Alexander H. Krappe, Ph.D., Assistant Professor of Romance Languages
 August C. Krey, Ph.D., Professor of History
 Samuel Kroesch, Ph.D., Professor of German
 John H. Kuhlmann, B.A., E.E., Assistant Professor of Electrical Design
 Maurice B. Lagaard, C.E., Assistant Professor of Structural Engineering
 Fred C. Lang, C.E., Assistant Professor of Highway Engineering
 William Le Borious, Instructor in Accounting

- Alex S. Levens, B.S. (C.E.), Instructor in Drawing and Descriptive Geometry
- George F. Lussky, Ph.D., Assistant Professor of German
- Gustav A. Lundquist, M.A., Assistant Professor of Rural Sociology
- George A. Maney, C.E., M.S., Assistant Professor of Structural Engineering
- John V. Martenis, M.E., Associate Professor of Machine Design
- William B. Millen, B.A., Instructor in Finance
- Cecil A. Moore, Ph.D., Associate Professor of English
- Amy P. Morse, B.A., Assistant Professor of Drawing and Design
- Wayne L. Morse, M.A., Instructor in English
- Walter R. Myers, Ph.D., Assistant Professor of Economics
- Charles W. Nichols, Ph.D., Assistant Professor of English
- William E. Niemackl, Instructor in Accounting
- Elizabeth Nissen, M.A., Instructor in Romance Languages
- Everett W. Olmsted, Ph.D., Litt.D., Professor of Romance Languages
- Benjamin W. Palmer, M.A., LL.B., Instructor in Business Law
- John I. Parcel, B.A., B.S. (C.E.), Professor of Structural Engineering
- Stanley H. Perry, B.A., Instructor in History
- Orrin W. Potter, E.M., Instructor in Drawing and Descriptive Geometry
- Charles H. Preston, B.A., C.P.A., Lecturer in Accounting
- George C. Priestler, B.E., M.S., Assistant Professor of Mathematics and Mechanics
- Thomas H. Quinn, Instructor in Business Law
- Frank M. Rarig, M.A., Professor of Public Speaking
- M. Emma Roberts, Instructor in Art
- Gertrude D. Ross, B.S., Instructor in Art Education
- Clare L. Rotzel, B.C.S., C.P.A., Associate Professor of Accounting, General Extension Division (in charge of Business courses)
- Frank B. Rowley, B.S., M.E., Professor of Mechanical Engineering
- Wilford E. Rumble, LL.B., Instructor in Business Law
- William T. Ryan, E.E., Professor of Electric Power Engineering
- Charles A. Savage, Ph.D., Professor of Greek
- A. J. B. Schmidt, B.S. in E., C.P.A., Instructor in Accounting
- Jean Lees Selvage, B.A., Instructor in English, General Extension Division
- Lee J. Seymour, B.A., Assistant Professor of Public Speaking, General Extension Division
- S. Carl Shipley, B.S., M.E., Professor of Machine Construction and Superintendent of Shops
- Charles F. Shoop, B.S., B.S.(M.E.), Professor of Steam Engineering
- William C. Smiley, LL.M., Assistant Professor of Business Law, Head of Correspondence Study Department, General Extension Division
- Arthur V. Smith, Instructor in Accounting
- Lawrence D. Steefel, Ph.D., Assistant Professor of History
- J. Warren Stehman, Ph.D., Associate Professor of Economics
- Thomas E. Steward, B.A., Instructor in Journalism

- Andrew A. Stomberg, M.S., Professor of Scandinavian Languages and Literatures
- George W. Swenson, M.S. (E.E.), Assistant Professor of Telephone and Telegraph Engineering
- Thomas A. H. Teeter, B.S. (C.E.), Associate Professor of Engineering, General Extension Division (in charge of Engineering courses)
- Milo E. Todd, B.A., E.E., Associate Professor of Radio and Electric Power Engineering
- Robert H. Tuttle, Instructor in Accounting
- Archie F. Wagner, B.A., C.P.A., Instructor in Accounting
- Warren C. Waite, Ph.D., Assistant Professor of Business
- George B. Watts, M.A., Instructor in Romance Languages
- Lehman Wendell, B.S., D.D.S., Instructor in Esperanto
- Hugh B. Wilcox, M.S., Assistant Professor of Mathematics and Mechanics
- Norman Wilde, Ph.D., Professor of Philosophy
- Frank W. Wilson, Instructor in Accounting
- Jeremiah S. Young, Ph.D., Professor of Political Science
- Otto S. Zelner, B.S. (C.E.) Associate Professor of Surveying

General Information

The General Extension Division is organized to meet the needs of persons who are unable to matriculate and enroll as full-time students in the University. Its purpose is to serve office, store, and factory employees, teachers and home makers, and persons seeking wider culture or sounder technical training. To this end, in addition to other activities, it organizes and directs late afternoon and evening classes in any part of the state where there is sufficient demand. Through such extension classes and through its correspondence courses the opportunity is presented to pursue subjects included in a liberal or vocational education, and to have these subjects credited toward an academic degree. It is understood that students desiring credit must meet the academic entrance requirements. For those whose preparation is incomplete, the opportunity is offered to make up the deficiencies and to continue with the regular course.

The extension year is divided into two semesters of sixteen weeks each, with an extra week devoted to examinations. Classes usually meet once a week in a two-hour session. Such classes ordinarily carry three credits or "credit equivalents" (see below). Those meeting more frequently and requiring more time in preparation carry more credit.

Admission.—It is not intended that any regulation should debar from the privilege of these courses any person who can profitably pursue them. Those persons who desire credit toward an academic degree must, however, comply with the regulations governing such degree. Those not desiring credit will be admitted, provided they are sufficiently mature (more than eighteen years of age), and can satisfy the department in which they wish to study that they are able to carry the work profitably to themselves and without hindrance to the class. Students may attend any class once before registering. All classes, except those in swimming, are open to both men and women.

Students who are graduates of accredited high schools or other approved preparatory schools are urged to file with the University registrar their credentials, so that the credits earned in the Extension Division may apply toward a University degree. Attention is called to the fact that those who are not graduates of accredited preparatory schools may satisfy the University entrance requirements in several other ways. They may take the University High School Board examinations; they may pass the regularly scheduled University entrance examinations; or they may take the entrance courses offered in the Correspondence Study Department of the Extension Division. (See the University bulletin of general information for further particulars.)

Registration.—Students should register at the Extension offices before the second meeting of the class in which they expect to enroll. Downtown offices are located in Minneapolis, St. Paul, and Duluth (see page 15 for location of these offices) in addition to the general office on the

campus. A class card will be given to the student at the time of registration, which must be presented to the instructor. In towns where no extension offices exist students will register with the instructor.

No student will be regarded as registered in any class until he has paid the required fee and presented his class card to the instructor.

Students are urged to enroll in advance for all extension classes. Registrations, as a rule, will not be taken at classes but must be made either at the city offices or at the campus office of the division.

Advice on registration.—Students who have had sufficient preparation need not start at the beginning of a subject but may take up the work at the point where they can pursue it with advantage.

It has been found that many persons register who cannot take the work with any great profit to themselves because of inadequate preparation. For this reason it is desirable that students should consult with the head of the department concerned before taking up any course, so that they may have proper guidance and direction.

“Credit equivalents” for extension courses.—Every student who successfully completes a course offered by the General Extension Division (including passing the final examination in that course) receives a “credit equivalent” equal in amount to the credit stated in the announcement of the course.

“Credit equivalents” for subjects prescribed in group courses leading to extension certificates (see pages 34 and 44) may be counted directly as credits toward such certificates.

The credits in the Extension Division are now computed in terms of “quarter” hours, in accordance with the present University usage, and not in “semester” hours, as was formerly the case. One semester credit equals one and one-half quarter credits. Courses meeting once a week for one semester normally carry three credits.

Conversion of credit equivalents into University credits.—Subject to the regulation that candidates for degrees must be regularly matriculated, and must complete in residence study a minimum of 45 quarter credits, “credit equivalents” may also be applied as credits toward a degree in any college of the University, so far as the subject conforms to the curriculum requirements of that college. The College of Engineering does not accept extension credits toward an engineering degree except by comprehensive examination.

Residence requirements.—By action of the University Senate, attendance on extension classes in Minneapolis, St. Paul, and Duluth is interpreted as meeting the requirement of residence at the University.

Application of credits.—Students desiring credit toward a degree must, of course, satisfy the entrance requirements of the college in which the degree is sought. Virtually all the courses listed under the heading Collegiate Courses carry University credit unless otherwise specified, and the same is true of nearly all of the business courses. A few courses listed under Engineering carry credits, tho others do not. Such credits will be

recorded in the registrar's office when the student has matriculated and established a record in the University.

Students must indicate at the time of registration whether or not they desire University credit in the courses pursued.

In many cases, by departmental regulations, the completion of more work in a subject than is included in one extension semester course is required before credit for any part of it can be counted on a degree. For information as to such courses see bulletins of the several schools and colleges.

The following regulations govern credit in the College of Science, Literature, and the Arts:

1. All courses for which credit is given in the College of Science, Literature, and the Arts, must be authorized with the credits by the Advisory Committee. But credit shall be given only to those extension courses which are conducted in essentially the same manner as the corresponding courses in the University, and which are carried on under similar conditions as to attendance, term's work, quizzes, and examinations.

2. Each credit course shall be directly in charge of a member of the faculty.

3. Any regularly enrolled University student successfully completing an approved course shall receive the appropriate credit.

4. Any person shall receive a certificate upon satisfactorily completing an approved course. The certificates entitle the holder to the corresponding University credits whenever he has earned forty-five credits in residence. The registrar or the Students' Work Committee shall in all cases pass upon the qualifications of the student.

5. The maximum credit towards a degree for work done in extension courses shall not exceed one-half the unit hours required for graduation.

6. Credit for an amount not exceeding one quarter of the unit hours required for graduation may be given at the University of Minnesota to students of such other extension schools or departments as may be approved by the Advisory Committee, provided that such credit shall be subject to the same provisions as govern credits in the General Extension Division of the University of Minnesota.

The following limitations as to students in residence at the University should also be noted:

1. No University student may enroll for extension courses for the purpose of removing a condition or failure.

2. No University student may enroll for an extension course if this would increase his credit hours beyond what the rules allow.

3. Any University student who wishes to enroll for an extension course must first obtain the approval of the dean of his college.

Examinations.—Examinations in all of the subjects given are conducted during the last week of each semester. All students who are eligible for credit and desire it must pass these examinations.

Condition examinations will be conducted at the convenience of the instructors. Students having conditions must pass a condition examination

within two semesters following the resumption of the student's extension work, otherwise the condition becomes a failure. A fee of \$1 is charged for each such examination.

A grade of "incomplete" not removed by the end of the second semester following the resumption of the student's extension work, becomes a condition or a failure as the instructor may direct.

Fees.—The fee for an extension class, meeting one evening a week for two hours, and continuing through one semester of seventeen weeks, with three hours credit, is \$10. Wherever the fee is more or less than this standard the amount is stated in the program of classes.

In case a student takes three or more courses simultaneously, a reduction of ten per cent is made in the total fee of \$30 or more.

The fee does not include the cost of texts or materials. Where mimeograph material is supplied in place of a basic text, a uniform charge of \$1 is made, payable at time of registration. For Veterans' Bureau trainees the material fees are paid by the bureau.

All fees are payable at the time of registration, and registration should not be deferred longer than the second meeting of any class. Checks should be made payable to the University of Minnesota.

Late registration.—Beginning with the first semester of 1925-26 an additional privilege fee for late registration will be charged as follows: \$1 per course during the third week of the semester, and \$2 per course during the fourth week. Each week is construed to extend through Saturday evening. Two meetings of each class will therefore have been held before these privilege fees become operative. No registration will be accepted later than the fourth week of a semester after the week in which the class begins, without the approval of the director of University Extension.

Refunds.—Students who cancel their registration before the middle of any semester may obtain a pro rata refund of the tuition fee, provided written notice is given the office of the Extension Division at the time of cancellation. No refund is made after the eighth week of the semester. In no case will a refund be made to a student of a class organized on a minimum registration basis. Two dollars (\$2) of each fee is non-refundable, being withheld to cover expenses of registration.

Class attendance.—Every student is expected to attend the meetings of his class regularly. For credit towards a degree or a certificate the following rule must be adhered to:

"No student whose absence exceeds three of the regular scheduled sessions of the course for a semester shall be admitted to the final examination of the course without special permission of the director of University Extension."

Reports of students' work.—Reports of students' work and grades are sent to the office of the registrar of the University at the close of each semester. A report of the grade and credit earned is sent from that office to the student. This information will not be given out at the office of the Extension Division.

Length of courses.—Most of the classes meet once a week for two hours, for a period of sixteen weeks, with an additional week for final examination.

Program of classes.—The time of meeting of the classes is stated in a printed program or schedule of classes issued by the Extension Division at the beginning of each semester. Ordinarily the classes will meet at 6:30 and 7:30 p.m., but a suitable time will be scheduled for any group. Classes arranged primarily for teachers often meet at 4:00 or 4:15 p.m. The program for the first semester will be sent out about September 10.

It should be understood that not all the courses listed in this bulletin are given in any one year. Final announcement of the courses offered in any semester will be found in a program issued for that semester.

The Minneapolis classes meet at the University, the Minneapolis City Hall, and the several schoolhouses. The St. Paul classes meet at the St. Paul City Hall, the Public Library, and also in schoolhouses. The Duluth classes meet in the St. Louis County Courthouse and the Central High School. In other places the classes will meet in such suitable quarters as may be obtained.

The exact place and time of meeting of each class will be announced in the program of classes.

Extension classes do not ordinarily observe the regular University holidays, except as shown in the calendar prefixed to this bulletin. In case sessions are missed for any reason they are to be made up by extra meetings within the semester limits.

Size of classes.—Classes will not ordinarily be organized for a smaller enrolment than fifteen. Under exceptional circumstances some continuation classes will be conducted for a minimum of twelve students. However, it should be understood that in some classes a larger registration will be required. Variations of the above rule will be made only at the discretion of the director.

Any course announced may be withdrawn if the registration for that particular course is considered insufficient. In case of withdrawal of any course the full fees paid will be refunded.

General Extension offices.—The General Extension Division maintains the following offices, where full information and bulletins may be obtained. Registration in all courses will be made at these offices:

Minneapolis: Room 736, Security Building (telephone, Main 0624).
New Administration Building, University campus (telephone Dinsmore 2760).

St. Paul: Room 920, Pioneer Building (telephone, Cedar 7312).

Duluth: Room 704, Alworth Building (telephone, Melrose 7900).

Department of Collegiate Instruction

Purpose.—The courses here offered are selected in the main from the College of Science, Literature, and the Arts, with two purposes in view. First, they are designed to afford an opportunity, to persons who are candidates for degrees but who are unable to pursue their entire college course in residence, to complete a part of their work while otherwise engaged. Second, the advantage of university training in cultural subjects is offered those who can devote one or more evenings a week to such work, regardless of any desire for university credit.

Courses offered.—Naturally only a portion of the numerous "academic" or "collegiate" courses offered by the University to its resident students can be given through extension classes. Graduate courses are excluded by a regulation of the Graduate School to the effect that no credits earned in extension courses may be counted toward an advanced degree. Research courses, advanced laboratory courses, and courses requiring a large amount of library reading are by their very nature unfitted for extension teaching; and some subjects tho of a more elementary nature are ruled out because of the difficulty of getting the minimum class of fifteen. Additional courses to those listed in this bulletin will be given upon the request of any responsible individual or group willing to organize a sufficiently large class to insure the success of the undertaking.

The number prefixed to the course is usually the same as that given to the corresponding course in the regular college bulletin. The letters *ex* affixed to a number indicate either that the course is not given in the regular campus work or that it is materially modified for the purposes of extension teaching.

Credits and fees.—For detailed statement concerning credits and fees, see under General Information.

Schedule of classes.—A printed schedule indicating the time and place of meeting for each class is issued about ten days before the beginning of each semester, and will be sent upon request. Courses marked with a star (*) in the following lists were given last year.

ANTHROPOLOGY

114. Newer Immigrants. Characteristics, contributions, and distribution of the newer immigrant peoples in America; their modification and importance to us. Three credits; one meeting a week, second semester. Mr. Koenig.

ART

For courses in history of architecture, elements of architecture, etc., see under Department of Engineering Instruction. Under the heading Home Economics a course in interior decoration is listed.

- *Art Ed. 1. Fundamental Principles of Design I. Elementary problems with emphasis on value relations; the decorative use of natural material. Three credits; one meeting a week, first semester. Mrs. Hanley.

- *Art Ed. 1. Fundamental Principles of Design II. Design in relation to the house; a study of period furniture with trips to the Art Institute; also a continuation of design problems related to public school work. Three credits; one meeting a week, second semester. Mrs. Hanley.
- *Art. Ed. 7. Sketching. Drawing from the posed figure in charcoal, crayon, and pencil; action and memory drawing, blackboard practice. The course will help public school teachers in illustration work. Two credits; one meeting a week, first and second semesters. Class limited to twenty-five. Mrs. Hanley.
- *24-25-26. Free-Hand Drawing I-II. Free-hand perspective drawing in pencil, pen, charcoal, and wash from geometric solids and architectural details. Drawing in charcoal and water color from still life, figure details, and the antique. Three credits; one meeting a week, first and second semesters. Mr. Burton.
- *27-28-29. Free-Hand Drawing III-IV. Continuation of I and II. Drawing and painting from life and from casts, with lectures on the structure of the human figure and its application to decoration; assigned readings. Students completing both semesters will be taught how to make etchings. Prerequisite: Free-Hand Drawing I and II. Three credits; one meeting a week, first and second semesters. Mr. Burton.
- *33. Bookbinding. An elementary course in the theory and practice of making books, such as simple folio books, the commercial cased books sewed over tapes, the old monastery books bound in leather and sewed over sunken cords and raised cords, the tooling and dyeing of leather, wood blocking, simple portfolio making, and designing and execution of a bookplate. Lectures and practice in practical problems adapted to the needs of city teachers, occupational therapists, and social workers. Two credits; one meeting a week, first and second semesters. Miss Ross.
- *1ex. Camp Craft Course. An elementary course in the theory and practice of crafts needed in camps, such as pottery, bookbinding, wood blocking, stenciling, tie dyeing, batik, reed, basketry, pine needle basketry, geso and clay substitutes. No credit; one meeting a week, first and second semesters. Miss Ross.
- *2ex. Art Appreciation. A cultural course; being a survey of the art of Egypt, Persia, India, China, and Japan; the individual art of each country; interchange of influence; and effect upon present day art expression. The lectures will be illustrated by lantern slides and fabrics. Three credits; one meeting a week, first and second semesters. Miss Roberts.

ASTRONOMY

- *11. Descriptive Astronomy I. Lectures and recitations on the general principles and fundamental facts of astronomy, illustrated by lantern slides, simple problems, naked-eye and telescopic observations. Three credits; one meeting a week, first semester. Mr. Beal.

CHEMISTRY

- *14ex. General Inorganic Chemistry—the Non-Metals. A study of the common non-metallic elements and their principal compounds, with discussions of the laws and theories of chemistry. Five credits; one lecture, one recitation, and three hours' laboratory work a week, first semester. Mr. Geiger.
- *16ex. General Inorganic Chemistry and Qualitative Analysis—the Metals and Qualitative Analysis. A study of the common metallic elements and their principal compounds, with a further discussion of the laws and theories of chemistry, and systematic qualitative analysis. Open to students who have completed Course 14 or its equivalent. Five credits; one lecture, one recitation, and three hours' laboratory work a week, second semester. Mr. Geiger.
- *20ex. Quantitative Analysis—Gravimetric. Introductory course covering the general principles and methods of quantitative analysis. Typical problems are assigned and attention given to proper laboratory practice. Prerequisite: Qualitative Analysis. Five credits; two meetings a week, 2½ hours each, first semester. Mr. Geiger.
- *21ex. Quantitative Analysis—Volumetric. Continuation of Course 20ex. Five credits; second semester. Mr. Geiger.
- *27ex. Quantitative Analysis—Pre-medical. An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems are assigned and attention given to proper laboratory practice. Prerequisite: Qualitative Analysis. Given in connection with 21ex. Four credits; second semester. Mr. Geiger.

ECONOMICS

Classes in any of the subjects here listed will be formed on application of the minimum number of students.

- *5. Survey of Financial Institutions. For description, see Department of Business Instruction.
- *6. Principles of Economics. For description, see Department of Business Instruction. Three credits; one meeting a week, first semester.
- *7. Economic Problems. For description, see Department of Business Instruction. Three credits; one meeting a week, second semester.
72. Economics of Transportation.
85. Principles of Marketing. A general course dealing with the mechanism and operation of markets, the price-making process, wastes of competition, etc.
- *146. Investments and the Stock Exchange. For description, see Department of Business Instruction.
- *149. Business Cycles and Forecasting. For description, see Department of Business Instruction.
- *155. Business Finance. For description, see Department of Business Instruction.

- 161. Labor Problems and Trade Unionism.
- 191. Public Finance and Taxation.

EDUCATION

In addition to the courses listed below, attention is directed to the courses described under the heading Psychology, and also to the special course in higher algebra (listed under Mathematics) in which considerable attention is given to the related problems of arithmetic and their presentation in the schools.

- *3. Educational Sociology. A course designed to explain, from the sociological standpoint, what the aims of education are, and what subjects are of most value; also designed to show how education can predetermine the institutions of the future. Three credits; one meeting a week, first semester. Mr. Finney.
- *55. Elementary Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. Introduction to test and measurement in education, and general statistical methods; analysis of the learning process; suggestions for improvement of study; criticism of marks as measures of school work. Open to qualified students. Three credits in College of Education only; one meeting a week, both semesters. Mr. Bane.

ENGLISH

COURSES IN LITERATURE

- *1. Survey of English Literature I. A general study of the most significant English classics from Shakespeare to Swift. Lectures, recitations, and assigned readings. Three credits; one meeting a week, first semester. Mrs. Selvage.
- *2. Survey of English Literature II. A continuation of Course I; from Swift to Stevenson. Three credits; one meeting a week, second semester. Mrs. Selvage.
- 8. Shakespeare. Shakespeare's development as a dramatist up to King Lear, with some attention to the general history of English drama from 1580 to 1603. The course will include the reading of all Shakespeare's earlier plays and the masterpieces of his chief contemporaries, as well as studies in the technique of Elizabethan play-writing and producing. Three credits; one meeting a week, first semester.
- *44-45. American Literature. Lectures on American literature, with extensive readings from the principal poets and prose writers of the United States. Little attention is paid to the novelists in this course. Six credits; one meeting a week, first and second semesters. Mr. Moore, Mr. Nichols.
- *66. The English Novel. A course dealing with the novel from the time of Scott to the present. Introductory lectures on the earlier novel; a study of Scott, Dickens, Thackeray, George Eliot, Meredith, Hardy,

- and others, with some work on twentieth-century fiction if time permits. Required reading of at least eight novels. Three credits; one meeting a week, first semester. Mr. Hillhouse.
70. Elizabethan Drama. Shakespeare's later development as a dramatist, with some attention to the general history of English drama from 1603 to 1642. The course will include the reading of all Shakespeare's later plays and of the masterpieces of his chief successors. The decadence of Elizabethan dramatic art will be studied, and consideration given to the evolution of the modern, or picture, stage. Three credits; one meeting a week, second semester. Mr. Hessler.
109. The Romantic Poets. A study of the Romantic School of poets from Wordsworth to Keats, and the influence of the French Revolution upon them. Three credits; one meeting a week.
- *129. Modern Drama. Reading of about twenty-five plays by the chief dramatists, English, American, and Continental, beginning with Ibsen. Lectures on background material, and class discussions of plays assigned. Three credits; one meeting a week, first semester. Mr. Hillhouse.
136. The Contemporary Drama. A study of the drama from Ibsen to the present. Reading of about twenty-five plays by the chief dramatists, both English and Continental. Three credits; one meeting a week, second semester. Mr. Hillhouse.
151. Recent Poetry. Poetry in England and America since the death of Queen Victoria; the main tradition and tendencies now prevailing. Three credits; one meeting a week, second semester.
155. The American Novel. The beginnings of the American novel and short story and their development to about 1865. Among the writers included are Charles Brockden Brown, Irving, Cooper, Poe, Hawthorne, Thomas Bailey Aldrich. Three credits; one meeting a week, second semester. Mr. Moore.

COURSES IN COMPOSITION

For a course in Business English, see that heading under Department of Business Instruction.

- *4. Composition IV. Practical training in writing, largely exposition; analysis of prose selections and of compositions written by the class. The student will be required to do a certain amount of reading from the classics. Three credits; one meeting a week, first semester; repeated in second semester. Mrs. Selvage.
- *5. Composition V. A continuation of the preceding course. Three credits; one meeting a week, second semester. Mrs. Selvage.
- *6. Composition VI. A continuation of Courses 4 and 5. A brief study of the essay, and of expository description and narration. Three credits; one meeting a week, first semester. Mrs. Selvage.

(Note: Survey of English Literature I and II plus Composition IV, V, VI is the equivalent of the freshman work in English in the University day school. Composition IV, V, VI is the equivalent of the work in English required of all technical students in the University.)

- *11. Description and Narration. Principles and practice of description and narration, with analysis of selected specimens. Open to those who have completed Courses IV, V, VI. Three credits; one meeting a week, second semester. Mrs. Selvage.
- *69-70. Short Story-Writing. An advanced course in writing for those who have had experience in writing for publication or have had preliminary training in the technique of writing. Open for credit only to those who have had at least two years of college courses in writing or the equivalent. Six credits; one meeting a week, first and second semesters. Miss Chase.
- 51ex. English for Engineers. A course in practical English, designed to meet the professional needs of engineering students. The material of this course will include business letters—about twelve types, reports, estimates, instructions, etc. Some attention will be given to oral English. Three credits; one meeting a week, first semester.

COURSES IN PUBLIC SPEAKING

- Students in public speaking will be interested in the course in parliamentary law described on page 27.
- *41-42. General Course in Public Speaking. Extemporaneous speaking based on outlines; analysis and organization of speech materials; study of model speeches. Attention is also given to correctness and effectiveness in delivery. This course is designed to meet the practical needs of business and professional students. Six credits; one meeting a week, first and second semesters. Mr. Rarig, Mr. Garns, Mr. Morse, Mr. Seymour, Mr. Gray.
- *81-82-83. Interpretative Reading. Interpretation and oral expression of the various forms of literature—the essay, the short story, lyric and narrative poetry, and the drama. Open to those who have credit for Courses 1-2, College Composition and Rhetoric, and Public Speaking 41-42. Six credits; one meeting a week, first and second semesters. Mr. Rarig, Mr. Garns.
- *85-86. Advanced Public Speaking. The distinctive characteristics of oratorical style; analysis of the styles of representative orators. Written and extemporaneous speeches. Individual criticism and direction. Six credits; one meeting a week, first and second semesters. Mr. Rarig.
- 9ex. Story-Telling to Children. (1) Story-telling, its place and value; (2) choice of the story qualities desirable and undesirable; (3) preparation of the story, application of the short-story ideals of "singleness of impression" and "dramatic struggle"; reconstruction of the story from the child's viewpoint; (4) the problem of delivery—the group consciousness, holding attention, self-effacement, vocal and verbal adaptation. No University credit; one meeting a week, first semester. (Not offered in 1925-26.) Mr. Garns.
- *91. Play Production. A teacher's course in classroom dramatic interpretation. (Not offered in 1925-26.)

EXTENSION CLASSES

ESPERANTO

- *1. Beginning Esperanto. Pronunciation, grammar, and selected readings in prose and poetry with special emphasis on conversation. No credit; one meeting a week, first semester. Dr. Wendell.
- *2. Advanced Esperanto. A continuation of Course 1. Advanced prose readings, composition, and correspondence with foreign Esperantists. No credit; one meeting a week, second semester. Dr. Wendell.

FORESTRY

- 1. Forest Conservation. Dealing with the history and development of the forests of Europe and discussing the forest problems of the United States in the light of the progress already made in other countries, with special emphasis on our national forest policy and our state forest policy; fire protection, taxation, etc. Three credits; one meeting a week, first semester. Mr. Cheyney.

GEOGRAPHY

- 61. Geography of Commercial Production. A study of the geographic basis for the production of the principal commodities which enter into world trade, together with a consideration of the areas of consumption. Special attention is given to the factors localizing great manufacturing districts. Three credits; one meeting a week, second semester. Mr. Davis.
- *71. Geography of North America. A systematic study of the United States, Alaska, Mexico, and the West Indies, with special reference to industrial and commercial opportunities and the distribution and activities of the population. Three credits; one meeting a week, first semester. Mr. Davis, Mr. Everly.
- *118ex. Geography of Europe. Includes (1) Europe as a whole, its main physical features, climate, soils, vegetation, natural divisions, and peoples; and (2) a separate consideration of each of the present day countries from the standpoint of natural features, resources, industries, resulting centers of population, government, etc. Incidental attention is paid to the effects of the World War and the period of reconstruction. Lectures, readings, and the preparation of one paper. Three credits; one meeting a week, first semester. Mr. Everly.
- *119ex. Geography of South America. (1) The continental factors: physiography, climate, vegetation, and peoples. (2) An intensive study of each country, including physical features, mineral resources, agriculture and stock-raising, transportation, centers of population, and world's commerce. Lectures, reading, and the preparation of one paper. Three credits; one meeting a week, first semester. Mr. Everly.
- *120ex. Geography of Asia. Includes (1) a study of the continent as a whole, its physiographic features, climate, and distribution of vegetation. (2) A detailed study of each country, agricultural and mineral re-

sources, transportation routes, and the response of the people to their geographic environment. Text, lectures, and reports. Three credits; one meeting a week, second semester. Mr. Everly.

GERMAN

- *1. Beginning German I and II. Pronunciation, grammar, conversation, and composition; selected readings in easy prose and verse. Open to students who have had no German, but both semesters must be completed before credit is given. Six credits; one meeting a week; first and second semesters. Mr. Kroesch.
- *2. Beginning German III and IV. Continuation of the above. Six credits; one meeting a week, first and second semesters. Mr. Kroesch.
- 10. Rapid Reading I and II. Short stories and dramas by Storm, Heyse, Baumbach, Lessing, Goethe, Schiller, Hebbel, and Sudermann. Class work and discussions are conducted in German. Open to students who have had at least one year of German. Six credits; one meeting a week, first and second semesters. Mr. Lussky.
- 13. Elementary Conversation I and II. Conversation on topics of everyday life, aiming at fluency in the use of idiom; not a course in composition; organized on the laboratory basis. Intended for those who have had at least one year of German. Six credits; one meeting a week, first and second semesters. Mr. Davies.
- 17. German for Graduate Students. Open to students who have had one year of German recently. This course is intended for candidates for advanced degrees who wish to acquire a reading knowledge of German. Three credits; one meeting a week, first semester. Mr. Lussky.

GREEK IN ENGLISH

- *1. Greek Mythology. A course of lectures, textbook work, and illustrative reading; dealing with the myths which appear in the literature and art of ancient Greece. The course will be illustrated with the stereopticon. The origin and evolution of the myth, its relation to Greek literature, philosophy, and religion, and its influence upon later literature will be touched upon. No knowledge of Greek is required for this course. Three credits; one meeting a week, second semester. Mr. Savage.
- *2. Greek Literature and Life. A course dealing with the literature, life, and art of the ancient Greeks. Lectures and illustrative readings by the instructor, assigned readings in translations, and textbook work by the class; conferences and informal discussions. The character and influence of Greek culture, especially along the lines of literature and art will be discussed, and the course will be illustrated with the stereopticon. No knowledge of Greek is required. Three credits; one meeting a week, first semester. Mr. Savage.
- *3. Greek Drama in English. A critical reading and interpretation of representative Greek plays in English translation, together with lectures

on the origin, development, character and influence of the Greek drama, and special stereopticon illustrations of Greek plays and Greek theaters. Lectures supplemented by textbook work, readings, and informal discussions. No knowledge of Greek is required. Three credits; one meeting a week, first semester. Mr. Savage.

HISTORY

- *1. Modern World I. Survey of political, social, and economic factors and events in European history from 1648 to the rise of Napoleon. Three credits; one meeting a week, first semester. Mr. Perry.
- *2. Modern World II. Survey beginning with the Napoleonic period, giving special attention to the reform and revolutionary movements, and to the formation of new states in Europe. Three credits; one meeting a week, second semester. Mr. Perry.
- *3. Modern World III. Europe since 1870, with particular reference to international alliances and rivalries, economic and political expansion and the new imperialism, the diplomatic background of the Great War, the Great War and the treaties of peace, efforts at reconstruction and the new Europe. Three credits; one meeting a week, first semester. Mr. Perry.
- 8. The Renaissance. Outline of European history from 1300 to 1648, with emphasis on the development of the intellectual, artistic, and social phases of civilization. Open to all. Three credits; one meeting a week, second semester. Mr. Krey.
- 11. The Middle Ages. An outline of medieval history from the fall of the Roman Empire to about 1300, with emphasis upon such topics as feudalism, the medieval church, the crusades, conflicts of papacy and empire, and medieval culture. Three credits; one meeting a week, first semester. Mr. Krey.
- *21. United States, 1776-1840. Survey of development of the United States from the Revolution to 1840, with special reference to growth of democratic institutions, the influence of the West, and the growing nationalism. Three credits; one meeting a week, first semester. Mr. Perry.
- *22. United States, 1840-77. Survey of the background of the Civil War, the war and reconstruction, with special reference to slavery, westward expansion, the frontier, the Public Land question, and the social, political, and economic systems before and after the war. Three credits; one meeting a week, second semester. Mr. Perry.
- 124. European Expansion since 1815. Special attention to Africa, India, and Central Asia. Three credits; one meeting a week, first semester. Mr. Steefel.

HOME ECONOMICS

- *3. Textiles. Includes a discussion of those points in fabric study that are of value to both the purchaser and seller of fabrics—fabric structure, fibers employed in their manufacture, methods of substitution and adulteration, tests for quality, art and economic considerations in their purchase for clothing and household purposes. Three credits; one meeting a week, first semester. Miss Caplin.
- *13. Dressmaking. A course in the technique of clothing construction that will give practice in the use of commercial patterns, modeling on the dress form, and application of construction processes. Problems: preparation of a dress form, and the making of a wool dress and tailored silk waist. Three credits; one meeting a week, first semester.
- 17. Advanced Clothing Construction. A laboratory course involving an application of the principles of costume-modeling in the construction of one high grade garment, suit, coat, or dress. Three credits; one meeting a week, second semester.
- *131ex. Interior Decoration. The course will be prefaced by such a discussion of house plans as will give a proper and necessary background for the major part of the work. The principles involved in house-furnishing will then be taken up in lecture, illustrated by lantern slides and actual materials wherever possible. Such subjects as wall treatment, rugs, selection and arrangement of furniture, hangings, pictures, and accessories will be discussed at first separately, and later as they relate to each other and the room as a whole. Three credits; one meeting a week, second semester. Miss Morse.
- *21ex. Nutrition. A brief course in the fundamental principles of human nutrition as applied to the feeding of adults, under conditions of health and under such pathological conditions as are chiefly dependent upon dietetic treatment. Three credits; one meeting a week, first semester.

JOURNALISM

- *1. News-Writing I. Practice in writing types of stories covered by reports for metropolitan newspapers. Study of style, structure, news value, and news-gathering methods, with practice in getting news. Analyses of American newspapers. Three credits; one meeting a week, first semester. Mr. Barlow, Mr. Steward.
- *2. News-Writing II. A continuation of the above, with study of feature stories. Three credits; one meeting a week, second semester. Mr. Barlow, Mr. Steward.

MATHEMATICS

One class in higher algebra (Course 1) will be organized for grade school teachers. In this class the relations of arithmetic and algebra will be stressed in such a way as naturally to aid the arithmetic teacher. In general the last half-hour of each session will be devoted to a discussion of

specific teaching difficulties brought forward by members of the class, and to which a right understanding of the principles of algebra, and the relation to arithmetical processes, will usually suggest the solution.

- *A. **Plane Geometry.** A course covering elementary geometry as usually given in accredited high schools. Rectilinear figures and the circle, with miscellaneous original exercises and some elementary construction problems; proportion, similar triangles, proportional properties of line segments, proportional properties of chords and secants; trigonometric ratios, areas of polygons, regular polygons, and circles. Prerequisite: elementary algebra. One-half entrance credit; one meeting a week, first and second semesters. Mr. Edwards.
- *B. **Solid Geometry.** A course of high school grade designed to give a knowledge of the standard theorems and exercises, to develop the student's imagination and initiative, and to give a well-rounded view of the subject by practice in special proofs and original exercises. Prerequisite: Course A. One-half entrance credit; one meeting a week, first and second semesters. Mr. Edwards.
- *I. **Higher Algebra.** A review and a collegiate treatment of the topic for those who have had one year of elementary algebra. The course includes linear equations in one, two, and three unknowns, with solution by determinants; ratio and proportion, variation, quadratic equations in one and two unknowns, graphs, progressions, binomial theorem. Prerequisites: Courses A and B, or equivalent. Not open for credit to those who present higher algebra for entrance to college. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *6. **Trigonometry.** A course in plane and spherical trigonometry, designed to meet the needs of beginners and to include the subject usually considered in the ordinary college course. The solution of triangles is treated quite fully, but not to the exclusion of analytical trigonometry. Prerequisites: Course 1 and logarithms. (Students who have not had logarithms in algebra may secure special mimeographed lessons on this subject.) Six credits; one meeting a week, first and second semesters. Mr. Teeter.
- *7. **College Algebra.** The study of variation, quadratic equations, special higher equations, simultaneous equations of the second degree, maxima and minima of functions, logarithms, theory of equations, solution of numerical higher equations, partial fractions, series of complex numbers, and mathematical induction. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *30. **Plane and Solid Analytic Geometry.** Includes systems of co-ordinates, loci, the type forms of the equation of the straight line with application, the circle, central and general conic sections, tangents, diameters, asymptotes, some higher plane curves, parametric loci, polar curves. The fundamental problem of the equation and its locus forms the basis of the course. Prerequisites: Courses 6 and 7. Six credits; one meeting a week, first and second semesters. Mr. Teeter.

- *50. Differential Calculus. A first course in differential calculus, including differentiation of algebraic and transcendental functions, with attention to the notion of the limit of a function, continuity of a function, and the derivative. Extensive practice in the technique of differentiation by means of exercises and applications to maxima and minima, tangents, normals, curvature, singular points, velocity, and acceleration. Elementary discussion of Rolle's theorem and the law of the mean, indeterminate forms, and partial differentiation. Textbook with supplementary written lectures and exercises. Prerequisites: Courses 6, 7, and 30. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *51. Integral Calculus. First course in integral calculus. The integration of various types of functions, the definite integral with application to areas, surfaces, and volumes of geometric figures, rectification of curves and simple problems of mechanics; practice in the technique of integration and the use of tables of integrals; evaluation of simple, double, and triple integrals. Prerequisite: Course 50. Six credits; one meeting a week, first and second semesters. Mr. Edwards.
- *106. Differential Equations. Intended for students who expect to continue the study of engineering, the physical sciences, or pure mathematics. The primary object of the course is to familiarize the student with advanced differential and integral calculus and the application of common types of differential equations to geometry, electricity, mechanics, and physics. Prerequisite: Course 51. Three credits; one meeting a week, first semester. Mr. Teeter, Mr. Edwards.

MUSIC

- *49ex. Historical Appreciation of Music. A general non-technical account of the principal musical forms, together with their historical origins and associations, and a study of the nature and scope of musical expression, designed to give an understanding of music as literature. Biographical and critical reading required. The course will be extensively illustrated. Three credits; one meeting a week, first semester. Mr. Ferguson.

PARLIAMENTARY LAW

- *7ex. Parliamentary Law. Presented not as a mere list of rules, but as a system, based upon principles, a knowledge of which will supply the answer to any of the seven thousand possible questions of procedure which may arise in the conduct of a deliberative assembly. The class is limited to forty members. No text is required, but *Roberts' Rules of Order*, Revised, is used as a basis of the course; mimeographed material will be furnished to students without charge. No college credit; one meeting a week, first semester. Mr. Hawley.

PHILOSOPHY

- *1. Introduction to Philosophy. A popular discussion of some of the great problems of philosophy. Three credits; one meeting a week, first semester. Mr. Conger.
- *10. Science and Religion. A popular discussion of religious problems as affected by contemporary science. Special attention to new contributions as they appear. Three credits; one meeting a week, second semester. Mr. Conger.
- *124. Political and Social Ethics. A study of ethical basis of society and the state and a consideration of some of the unsettled problems of politics and economics from the ethical point of view. Three credits; one meeting a week, first semester. (Not offered in 1925-26.) Mr. Wilde.
- *129. Modern Political Thought. A study of the development of modern theories of the nature, basis, and authority of the state. Beginning with a preliminary sketch of the ideas of Plato and Aristotle, the course will include the most important political theories from the Renaissance to the present. Three credits; one meeting a week, first semester. (Not offered in 1925-26.)

POLITICAL SCIENCE

The attention of students is called also to the course on Modern Political Thought listed under the heading Philosophy.

- 1. American Federal Government. An elementary course in American government and politics designed for those studying the problems of citizenship, and for teachers. (Not offered in 1925-26.)
- 7. State Government. Complementary to Course 1 above. (Not offered in 1925-26.)
- *135. Current Political Problems. Physical problems such as territory and the people; citizenship and Americanization; the electorate—its burdens and such reforms as proportional representation and the short ballot; the place of political parties; distribution of political power; the making and amending of constitutions; the reorganization and improvement of the three departments of government; recent experiments with popular control—the initiative, referendum, recall, and direct primaries; internationalism and foreign affairs; struggle of classes or government by blocs; some municipal problems; the place of education in a democracy. Three credits; one meeting a week, first semester. Mr. Young.
- *145. Legislative Powers and Methods. Source and scope of the legislative power; methods used by legislative bodies; current political questions; formulation and defense of legislative bills. Three credits; one meeting a week. Mr. Young.
- 157. Recent Social Legislation. The governmental powers used for social legislation, both state and federal; the methods used; peace and security from crime; safety and health; public morals, including such

subjects as gambling, lotteries, speculation, intoxicating liquors, sexual vice, and public amusements; economic relations that are semi-social, such as advertising, minimum wage, and restrictions on contracts, city planning and police power restrictions on the use of private property. Three credits; one meeting a week, first semester. Mr. Young.

- *158. Government and Business. Governmental powers; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation. Three credits; one meeting a week. Mr. Young.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

- *53. Elements of Preventive Medicine. Susceptibility, resistance, and immunity to disease; methods of spread and the prevention of communicable and degenerative diseases; protection of food, water, and milk; school health work; vital statistics. This course presents the basis essential to effective health work whether this work be in the practical field, such as public health nursing and physical education, or in the more theoretical side of teaching. Prerequisites: Psychology 1-2 and Bacteriology 1 (or equivalent). Three credits; one meeting a week, first semester. Dr. Diehl.
- *62. Principles of Public Health Nursing. Development, principles of organization, administration and supervision of public health nursing; methods of co-operative endeavor with social agencies; health teaching as an essential factor in the promotion of individual and community well-being. This course is primarily for students already active in the field of Public Health Nursing. It aims to enlarge an appreciation of the community health problems and a knowledge of the most effective methods of dealing with them. Graduate nurses only are eligible for enrolment with credit. Prerequisite: Course 53. Three credits; one meeting a week, second semester. Miss Butzerin.
- *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. The course deals with the practical problems of school health supervision and health education. It is intended primarily for teachers, directors of physical education, school nurses and administrators. Prerequisites: Biology 1-2 and Psychology 1-2. Three credits; one meeting a week, first semester. Dr. Diehl, Dr. Boynton.

PSYCHOLOGY

- *1. General Psychology I: Beginners' Course. Description and illustration of general aims and methods of psychology, introduction to analytic study of human conduct, with emphasis upon the native equipment of man. Special topics: reflex and instinctive adjustment to life; the rôle of the nervous system in conduct; emotion and feeling; sense-organ

- equipment; characteristics and conditions of attention; heredity and intelligence. Three credits; one meeting a week, first semester. Mr. Bane.
- *2. General Psychology II. A survey of important factors in mental development; study of habit formation and principles of economy in learning. Special topics: perception; memory and its improvement; imagination; problems of social adaptation, such as insanity, the delinquent, the criminal; factors in personality; mental hygiene. Prerequisite: Psychology I. Three credits; one meeting a week, second semester. Mr. Bane.
- *3. Psychology Applied to Daily Life. Measurement of mental traits, development of intelligence, organization of personality, with applications to selected problems in medicine, law, education, sociology, and daily life. Open to all applicants. Prerequisite for college credit: Psychology I. Three credits; one meeting a week, both semesters. Mr. Bane.
- *Educ. 55. Elementary Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. For full description see under Education. Open to qualified students. Credited in College of Education, but not in College of Science, Literature, and the Arts. Three credits; one meeting a week, both semesters. Mr. Bane.

PUBLIC SPEAKING AND RHETORIC

See English on page 19 of this bulletin.

ROMANCE LANGUAGES

FRENCH

- *1-2. Beginning French. Grammar, pronunciation, reading, and practice in speaking; practice in conversation will be given early in the course. Open to all. Both semesters must be completed before credit is given for the first semester. Six credits; one meeting a week, first and second semesters. Mr. Clefton, Mr. Watts.
- *3. Intermediate French. Reading, grammar, and composition. French grammar review, readings from modern authors. Open to all who enter the University with two years of French. Both semesters must be completed before credit is given for the first semester. Six credits; one meeting a week, first and second semesters. Miss Guinotte, Mr. King.
- *5. French Readings for Graduate Students. Outline of grammar and reading of texts to prepare students for the French examination required of those who are candidates for advanced degrees. No previous knowledge of French required. Six credits; one meeting a week, first and second semesters. Mr. Frelin.
- *20. Elementary French Conversation and Composition. The course will include a careful drill in pronunciation and practical phonetics. Pre-

requisite: French 1-2. Six credits; one meeting a week, first and second semesters. Miss Nissen.

SPANISH

- *1-2. Beginning Spanish. Grammar, pronunciation, reading, and practice in speaking. Open to all. Both semesters must be completed before credit is given for the first semester. Six credits; one meeting a week, first and second semesters. Mr. Olmsted, Mr. Krappe.
- *3. Intermediate Spanish. Readings from modern authors; grammar review; composition work, devoted chiefly to correspondence and commercial practice. Spanish will be as largely as possible the language of the classroom. Open to those who have had Spanish 1-2 and are approved by the teacher. Six credits; one meeting a week, first and second semesters. Mr. Fichter.
- *20. Elementary Spanish Conversation and Composition. The course will include a careful drill in pronunciation and practical phonetics. Prerequisite: Spanish 1-2. Six credits; one meeting a week, first and second semesters. Mr. Arjona.
- *50. Advanced Spanish Conversation and Composition. Prerequisite: Spanish 1-2 or a satisfactory knowledge of Spanish grammatical principles and some practice in speaking. Those who desire advanced credit in Spanish courses of the College of Science, Literature, and the Arts will be required to do outside work in some special subject, prepare special reports, and pass special examinations. Six credits; one meeting a week, first and second semesters. Mr. Arjona.

SCANDINAVIAN

- *5. Norwegian Survey. Prose and Poetry. Six credits; one meeting a week, first and second semesters. Mr. Bothne.
- 10-11. Advanced Swedish. Brief review of Swedish grammar, reading of selected texts in Swedish literature, especially Tegner's *Fritiofs Saga*, Runeberg's *Fanrik Stals Sagner*, and Grimberg's *Sveriges Historia*. Open to all who have the equivalent of one year in Swedish. Six credits; one meeting a week, first and second semesters. Mr. Stomberg.
- 107-108. Modern Swedish Literature. A study of the Swedish novel from Fredrika Bremer to Selma Lagerlof. Open to students who have a practical reading knowledge of Swedish. Six credits; one meeting a week, first and second semesters. Mr. Stomberg.
- 110. Ibsen. Lectures, reading, interpretation. Three credits; one meeting a week, first semester. Mr. Bothne.

SOCIOLOGY

- *1. Introduction to Sociology. The evolution of human society from its earliest beginnings to the present, including the fundamental factors involved and the social institutions arising, followed by an analysis of some social problems of the day and a discussion of psychic and biologic factors. Lectures, readings, discussion. Prerequisite to all

- other courses in Sociology when taken for University credit. Three credits; one meeting a week, first semester; repeated in the second semester. Mr. Clarke.
- *3. Educational Sociology. A course designed to explain, from the sociological standpoint, what the aims of education are, and what subjects are of most value; also designed to show how education can predetermine the institutions of the future. Three credits; one meeting a week, first semester. Mr. Finney.
6. Modern Social Reform Movements. A survey of attempts to overcome certain social maladjustments: child labor, the city, bad housing, poverty; degeneracy; movements for public health, industrial democracy, social insurance, protection of infancy and youth, public recreation, etc. Three credits; one meeting a week, first semester. Mr. Elmer.
14. Rural Sociology. The background and evolution of country life; rural conveniences, communication, co-operation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. Three credits; one meeting a week, second semester. Mr. Lundquist.
- *53. Elements of Criminology. The development of the general concept of crime and criminals; the types of criminals; causes of crime; social control of crime; treatment of the criminal; agencies for the prevention of crime. Three credits; one meeting a week, first semester. Mr. Elmer.
100. Social Psychology. (Not offered in 1925-26 unless requested.)
- *101. Social Organization. A study of the social mind and its communication, the problems of democracy, of class and caste, of social conflict and revolution, and of social organization on the rational and scientific basis for social efficiency and progress. Lectures, reading, discussion. Course 1 is a prerequisite if University credit is desired. Three credits; one meeting a week, first semester. Mr. Finney.
102. Social Control. A study of the social, psychological, and physical factors which control and direct people in their social relationships. Subjects considered are the origin, evolution, and direction of social control; the means and technique of social control; the growth toward rational and scientific social control under the influence of a developing social science; the limits and purposes of social control. Designed for the same class of students as Course 100. Three credits; one meeting a week, second semester. Mr. Finney.
114. Rural Social Institutions. A detailed study of the problems of organization and efficiency of selected rural institutions, especially religious, educational, civic, and recreational. Lectures, discussions, and reports. Three credits; one meeting a week, second semester. Mr. Lundquist.
- *119. The Family. The evolution of the family; its various forms and their relation to other social institutions; the rôle of the family in social evolution; contemporary problems of the family. Three credits; one meeting a week, second semester. Mr. Elmer.

120. Social Progress. (Not offered in 1925-26 unless requested.)
140. History of Social Thought. (Not offered in 1925-26 unless requested.)
141. Contemporary Social Thought. (Not offered in 1925-26 unless requested.)

SWIMMING

Instruction in swimming is given (to women) in the Women's Gymnasium of the University campus, through both semesters, one hour an evening, under competent instructors. The fee is \$5 a semester and a towel fee of ten cents is charged for each meeting. The courses carry no University credit. If a demand arises for classes for men, they will be organized in the University Armory. Persons taking the courses are required to conform to the regular University rules in regard to the gymnasium and the pool. Woolen suits are not permitted.

For sanitary reasons a health certificate signed by a reputable physician is required before registration is complete. For this purpose a physician will be at the gymnasium at the first meeting of the class, for whose service a nominal fee will be charged.

- *1. Swimming. Beginners—women only. One meeting a week; first and second semesters. Mr. Foster.
*2. Swimming. Advanced—women only. One meeting a week; first and second semesters. Mr. Foster.

Department of Business Instruction

Purpose.—The Department of Business Instruction recognizes the professional status of the business executive. It aims to give prospective executives thoro training for the work they are to undertake. Professional education rather than detailed drill in narrow technical processes is the object toward which instruction is directed. Scientific method in analyzing business data, trained intelligence in dealing with the human relationships with which business is made up, and well-developed sense of moral responsibility will be the foundations of business effectiveness in the future. Experience has proved that those persons whom the department is reaching can, by being actively employed during the day, comprehend and appreciate this course of instruction in a particularly advantageous manner. The courses are conducted in close co-operation with the School of Business of the University.

Instruction.—The subjects of instruction are divided into three groups of courses of study; namely, those aiding in a preparation for accountancy, those aiding in preparation for banking, and those having for their object a general business training. In each of these courses certain fundamental subjects such as business law, economics, and business English are required.

Upon the completion of one of these courses, a University certificate in accountancy, banking, or general business, as the case may be, will be granted.

Admission to courses.—Any person may be admitted to extension courses who is sufficiently mature and can satisfy the instructors in whose classes he wishes to register that he is able to carry the work profitably to himself and without hindrance to the classes. (See under heading General Information.)

The admission requirements for the School of Business are as follows:

1. Four high school units of English; or three units of English and four units of a foreign language; or three units of English and two units each of two foreign languages.

2. One unit of algebra and one unit of plane geometry, and enough additional work to make in all fifteen units, of which not more than four may be in Group F.

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

A detailed statement of the entrance subjects, grouped into six groups, may be found in the University bulletin of general information. The completion of preparatory courses as above outlined will also be accepted by the State Board of Accountancy as the preliminary high school training required of applicants for the degree of C.P.A.

Advanced standing in the School of Business.—Students in the Extension Division who have completed with a grade of "C" the equivalent of three years of one of the four-year programs in the School of Business of the University of Minnesota may obtain the degree of bachelor of science in business by registering in the School of Business for their last year's work. A program of at least thirteen hours per quarter must be carried for the three quarters of the final or senior year. Students interested in the programs of study and graduation requirements of the School of Business should obtain a copy of its bulletin from the registrar.

Credits and fees.—The credits are stated throughout in terms of "quarter" hours, and not in "semester" hours as was formerly the practice. One and one-half quarter credits equal one semester credit. The fee for a class which meets once a week in a two-hour session and carries three credits is ten dollars. (For more detailed statement, see under General Information.)

Certificates in accounting, finance, and general business.—Credits earned in this department can be applied towards a University certificate in accountancy, finance, or general business, as the case may be, and in addition, where the student has satisfied the University entrance requirements, may be applied towards a degree from the School of Business under certain restrictions. (For further information on this subject see the bulletin of the School of Business.)

The requirements for each of these certificates are set forth below. It is possible for a student to obtain two of the certificates listed above, but the second certificate will not be granted until the student has earned an additional 9 credits over the 45 credits required for the first certificate.

Group course in accountancy.—This course is designed to meet the needs of two classes of students, namely those who wish to prepare to take the state C.P.A. examinations with a view to becoming public accountants, and those who aim to fit themselves for responsible positions with private business firms.

For the student who wishes to pursue either object we recommend that he plan to take the regular course herein outlined and thus secure a broad foundation for his work.

Upon the satisfactory completion of this course, the University certificate in accountancy will be granted.

Students of experience and some maturity may join a class as auditors, in case they do not care to secure credit for the course toward a certificate in accountancy. These students will not be called upon to take part in the discussions nor to turn in work, which is required of students registering for credit. In this way the University hopes to make available the benefits of the courses to those who feel they lack the opportunity or time to do the work regularly required in the course.

Attention is called to the following more specialized courses for those who desire to get the most out of their accounting studies:

Constructive Accounting
Accounting Systems
Interpretation of Accounts
Interpretative Practice and Procedure
Business Management
Functional Problems and Cases in Management

While these courses are not specifically required for a certificate in Accounting, it is suggested that they be used as electives where practicable.

The course requires a total of 45 quarter credits, as follows:

Principles of Accounting A (3 credits), Principles of Accounting B (3), Accounting Laboratory A (1½), Accounting Laboratory B (1½), Accounting Practice and Procedure A (3), Accounting Practice and Procedure B (3), Auditing A (3) and Auditing B (3), or Cost Accounting A (3) and Cost Accounting B (3), Business Law A (3), Business Law B (3), Business Law C or D (3), Economics (3), Business English (3), Elective subjects (9).

Group course in banking and finance.—This course is intended to meet the needs of (1) those who are preparing for, or who are now engaged in such occupations as banking, corporation management, stock and bond brokerage, credit work, or financial journalism; and (2) business men who wish to utilize in their particular business modern scientific knowledge of practical financial nature.

Beginning with the year 1923-24, the University certificate in finance is granted to those who complete a total of 45 credits distributed as follows:

Principles of Economics (3), Banking and Finance A (3), Banking and Finance B (3), Banking and Finance C (3), Banking and Finance D (3), Business English (3), Principles of Accounting A (3), Principles of Accounting B (3), Accounting Laboratory A (1½), Accounting Laboratory B (1½), Business Law A (3), Business Law B (3), Business Law C or D (3), Elective subjects (9).

Group course in general business.—For the benefit of students who do not care to specialize in either accounting or in finance, yet wish to secure recognition as having completed a definite group of subjects, the following course is arranged.

The University certificate in general business will be granted to those who successfully complete a total of 45 credits distributed as below.

The electives should be selected with a view to specializing in some particular field, as in advertising and selling, in railroad traffic, and the like.

Business English (3), Business Law A (3), Business Law B (3), Business Law C (3), Business Law D (3), Principles of Accounting A (3), Principles of Accounting B (3), Accounting Laboratory A (1½), Accounting Laboratory B (1½), Economics A (3), Economics B (3), Electives (15).

Description of subjects offered.—A complete list of the subjects offered is given below:

ACCOUNTING

The first year's work consists of, first, a series of lectures and discussions in the principles of accounting; and second, the putting of these principles to practical application in the working out of specific problems. Students not desiring to specialize in accounting may omit this latter course, i.e., Accounting Laboratory A and B; but all who take the laboratory courses are required to take the corresponding courses in accounting principles.

- *10. Introduction to Accounting. A course designed for those who are not prepared by experience or training to enroll immediately in Principles of Accounting, but who desire to overcome their deficiencies and pursue the regular accounting courses. The course will take up the purposes of accounting, the use of books of original entry, posting to the ledger, the trial balance, closing the ledger, preparation of simple trading statements. No credit; one evening a week, first semester. Mr. Houston.
- *25. Principles of Accounting A. Designed to cover fundamentals. Classification of the balance sheet and operating accounts; the books and records of original entry; special discussions on the trading margins, operating expenses, etc.; various bookkeeping and accounting operations, such as accruals, deferred charges; special systems of handling accounting data, such as departmentalization of accounts, imprest cash systems, the treatment of controlling accounts and auxiliary ledgers; preparation of simple working sheets and statements. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Heilman, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Smith.
- *26. Principles of Accounting B. Continuation of Principles of Accounting A with more special reference to manufacturing and corporation accounts; treatment of goodwill and depreciation, accountant's working sheet; adjusting of surplus, sinking funds, and reserve accounts; drafting condensed balance sheets and income statements. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Heilman, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Smith.
- *25L. Accounting Laboratory A. The working out of practical problems covering the subject-matter discussed in Principles of Accounting A, under the guidance of an instructor. One and one-half credits; one meeting a week, first semester. Mr. Blandin, Mr. Culmer, Mr. Jacobson, Mr. Le Borious, Mr. Niemackl, Mr. Smith.
- *26L. Accounting Laboratory B. Work of similar kind covering the subject-matter discussed in Principles of Accounting B. One and one-half credits; one meeting a week, second semester. Mr. Blandin, Mr. Culmer, Mr. Jacobson, Mr. Le Borious, Mr. Niemackl, Mr. Smith.
- *131. Cost Accounting A. A specialized course in manufacturing accounts. Chief objectives of the course are, first, the development of principles

- useful in determining the profitableness of each branch of manufacturing; and second, the establishment of a basis to judge relative efficiencies of operation. Subject-matter includes consideration of materials, labor, and burden; continuous process and production order costs; burden distribution methods, standard costs, etc. Three credits; one meeting a week, first semester. Mr. Rotzel. Mr. Tuttle.
- *132. Cost Accounting B. A continuation of Course 131. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Tuttle.
- *134. Income Tax Problems. Course offered to those who have completed Principles of Accounting A and B for the purpose of familiarizing the accounting student with the accounting ramifications of the federal income tax law, and its application to various businesses and also to varying business conditions. The purpose of the course also will be to point out possible errors likely to be made in the preparation of the regular tax reports. Lectures, discussions, and working out of problems. Three credits; one meeting a week, first semester. Mr. Preston.
- *135. Auditing A. This course is essentially practical and is intended only for those whose previous training in the principles of accounting has been sufficient to enable them to be benefited by this advanced work. The chief aim will be to give students the training necessary to enable them to conduct audits and investigations either as private auditors or public accountants; to set up accounts for various purposes as a result of such audits or investigations and to prepare suitable reports thereon. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Wagner.
- *136. Auditing B. A continuation of Course 135. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Wagner.
- *137. Accounting Practice and Procedure A. An advanced course for the accounting student following the study of accounting principles. The object of the subject is twofold: first, to familiarize the student with the peculiar accounting problems of business; and, second, to afford the student the means to secure that necessary insight and skill which practicing accountants must possess in order to meet the demands made upon them. The work consists of the following: (a) a study of a distinctive group of accounting problems and the scientific solution of those problems; (b) a study of the accounting problems peculiar to representative business. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Wagner.
- *138. Accounting Practice and Procedure B. A continuation of Course 137. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Blandin, Mr. Houston, Mr. Le Borious, Mr. Wagner.
140. Accounting Practice and Procedure C. Constructive accounting. A course outlining subject-matter relative to the design and installation of a modern accounting system. The make-up of various forms for use in the system, purchase orders, receiving slips, invoices, requisitions, shop tickets, and other forms. The design and ruling of books of

- original entry; ledgers of various kinds. Three credits; one meeting a week, first semester. Mr. Rotzel, Mr. Schmidt.
- *141. Accounting Practice and Procedure D. Interpretation of accounts. The meaning of accounting reports and statements including balance sheets, income accounts, cost statements, etc. The value of comparison in interpretation. Consideration of the base of comparison. Proper place of statistics in the accounting fabric. Development of accounting ratios and their meaning. Practical problems in the above case method used. Three credits; one meeting a week, first semester. Mr. Schmidt.
- *142. Accounting Practice and Procedure E. Interpretative practice and procedure. The student is here given specific problems to solve and present to the class with the aid of the instructor along the lines of the study of particular cases in interpretation of accounts. Three credits; one meeting a week, second semester. Mr. Schmidt.
- *148. Accounting Practice and Procedure F. Practical accounting systems. Classification of industry according to types of accounting problems. Special features encountered in each class of industry. Constructive, operative, and interpretative features considered. Case methods used. Three credits; one meeting a week, second semester. Mr. Rotzel, Mr. Schmidt.
- *89. Business Management. Place of management in the field of business; business organizations, internal and financial; functions of business; principles of plant location; analysis of the functions of business; types of operating organizations; use of graphs in management qualifications of executives; compensation of labor; waste in industry considered. Three credits; one meeting a week, first semester. Mr. Schmidt.
- *90. Functional Problems and Cases in Management. Operating laws. Administrative problems; promotion, management and operating management contrasted. Sales and production policies. Practical problems in management and policies. Consideration of the human element. Aid given by accounting in making managerial decisions. Three credits; one meeting a week, second semester. Mr. Schmidt.

BANKING AND FINANCE

- *143. Finance A—Elementary Money and Banking. Designed as a general survey of the principles determining value and price and the inter-relationship of our various financial institutions. The origin, evolution, and functions of money; the nature and functions of credit and credit instruments; domestic and foreign exchange; functions of various credit agencies; government regulation of banking. Three credits; one meeting a week, first semester, Minneapolis; second semester, Minneapolis, if sufficient enrolment. Mr. Stehman.
- *155. Finance B—Financing a Business. The corporate form of financial organization and problems, such as the organization of a corporation; charters and articles of association; directors and officers, manner of

- their selection, their functions and responsibilities; forms of corporation stocks and bonds and their respective legal and financial characteristics; the marketing of securities; capital and revenue; intangible values; books and accounts; dissolutions, consolidations, and reorganization; trust and holding companies; the taxing of corporations; corporation statistics; the preparation and analysis of corporation reports; the corporation before the law. Prerequisite: Finance A. Three credits; one meeting a week, second semester, Minneapolis and St. Paul. Mr. Stehman.
- *146. Finance C—Investments and the Stock Exchange. Bonds, mortgages, stocks, and other forms of property in which funds may be invested, with emphasis on the needs of the conservative investor. The criteria of a good investment are carefully considered and tested by applying them to specific issues of governments, corporations, and individuals, including railroad, industrial, timber, and mining securities, and real estate loans. Stock exchange organization and operations. Prerequisites: Finance A and B, except that during 1925-26 this course may be taken with Finance A and on condition that Finance B is taken in the second semester, before credit is given for the course. Three credits; one meeting a week, first semester. Mr. Ebersole.
- *149. Finance D—Business Cycles and Forecasting. This course aims to give the student: first, a clear understanding of the sequence of events during a business cycle, and how business changes from depression to prosperity, and from prosperity to depression; and second, ability to find, read, and interpret such barometers of conditions as are readily available for determining the exact position of current events in the cycle. Prerequisites: Finance A and B, except that in 1925-26 this course may be taken at the same time that the student is taking Finance B. Three credits; one meeting a week, second semester. Mr. Ebersole.
147. Finance E—Banking Practice. Banking from the administrative point of view; organization of a bank; stockholders and directors; bank departments and their administration; deposits and tellers; bank reserves; circulating notes; checks, the clearing house, and transit department; collections; domestic and foreign exchange; problems involved in granting loans; credit department; how banks make a profit; accounting methods; the Federal Reserve System. Prerequisite: Finance A, except that during 1925-26 this course may be taken at the same time as the student is taking Finance A. Three credits; one meeting a week, first semester or second semester, Minneapolis or St. Paul, if sufficient enrolment.
- *145. Finance F—Foreign Trade and Foreign Exchange. The middle west produces almost half of the goods exported from the United States. This course is designed to give a working knowledge of the foreign markets for our goods, how to get in touch with them, and the mechanism of foreign exchange which is used in paying and collecting for goods sold. A thoro discussion of foreign exchange, fundamentals as

well as practice, and current foreign developments as they affect the foreign exchange market. Prerequisites: Finance A and E. Three credits; one meeting a week, second semester, St. Paul and Minneapolis, if sufficient enrolment. Mr. Millen.

41. Finance G—History of Banking and Finance in the United States. Prerequisite: Finance A. (Not offered in 1925-26.) Mr. Ebersole.
191. Finance H—Public Finance. Prerequisites: Finance A and elementary economics; second semester. (Not offered in 1925-26.)

BUSINESS ENGLISH

- *81. Business English. A practical course designed for business men and women who recognize the value of a command of English for business and everyday writing and conversation. The types of letters to be studied include adjustment, acknowledgment, recommendation, application, collection, follow-up, sales, and interdepartmental. Ability to write simple, grammatically correct English is a prerequisite. No credit toward a degree, three credits for a certificate in business; one meeting a week, first semester; repeated second semester. Mr. Conley, Mr. Creamer.
- *82. Business Correspondence. This course logically follows Business English 81. Less stress is placed upon grammar and more upon the general principles underlying successful letter writing. Students who have not had Course 81 will be admitted to this course upon the recommendation of the instructor. No credit toward a degree, three credits for a certificate in business; one meeting a week, second semester. Mr. Creamer.

BUSINESS LAW

The courses in Business Law are designed not merely to give a knowledge of the fundamental principles of law which should be known to every well-informed person, but particularly to aid the business or professional man in his practical legal problems. The credits may be applied in the College of Science, Literature, and the Arts, and as general academic credits in other colleges, but cannot be accepted as professional credits towards the degree of bachelor of laws.

- *51. Business Law A—Contracts and Agency. A brief introduction to the study of law with a general consideration of legal rights and remedies, followed by a more detailed survey of two subjects which are the legal basis for most business transactions. (1) Contracts—their formation, interpretation, operation, transfer and discharge, with some consideration of the Statute of Frauds. (2) Agency—the creation, nature, and termination of the relation; rights and liabilities of the parties. Three credits; one meeting a week, first semester; repeated in the second semester. Judge Bardwell, Mr. Smiley, Mr. Chapin, Mr. Hoshour.

- *52. Business Law B—Personal Property, Negotiable Instruments. A brief consideration of the nature of personal property, its transfer by sale or bailment, followed by a more detailed study of the Uniform Negotiable Instrument Act and the Uniform Bills of Lading Act. Prerequisite: Business Law A. Three credits; one meeting a week, second semester. Judge Bardwell, Mr. Smiley, Mr. Chapin, Mr. Hoshour.
- *53. Business Law C—Business Organizations, Insurance, Insolvency, and Bankruptcy. (1) The organization, management, and responsibility of associations, partnerships, corporations, and business trusts. (2) Elements of the law of insurance. (3) Insolvency and the National Bankruptcy Act. Prerequisite: Business Law A. Three credits; one meeting a week, first semester. Mr. Smiley, Mr. Glick, Mr. Palmer, Mr. Rumble.
- *54ex. Business Law D—Real Estate, Mortgages. The nature and classification of estates in land; deeds and conveyances; landlord and tenant; recording and abstracting; Torrens titles; liens and mortgages. Prerequisite: Business Law A. Three credits; one meeting a week, second semester. Mr. Smiley, Mr. Glick, Mr. Palmer, Mr. Rumble.
- *7ex. Parliamentary Law. For description see Parliamentary Law under Department of Collegiate Instruction. No college credit; one meeting a week, first semester. Mr. Hawley.

ECONOMICS AND COMMERCE

- *6. Elements of Economics. A fundamental course in economic principles as a basis for the study of current economic problems. Three credits; one meeting a week, first semester. Mr. Cummings, Mr. Myers.
- *7. Economic Problems. Current problems of importance will be studied, for example: business cycles and industrial depression, taxation, labor organizations, combinations and monopoly, immigration, international trade, and others. This course may be taken before Elements of Economics, but credit for it will not be granted until the elementary course has been successfully completed. Three credits; one meeting a week, second semester. Mr. Cummings, Mr. Myers.
101. Advanced General Economics. A course in advanced economic theory, dealing chiefly with the theories relating to value. Considers the application of certain economic principles to current business problems from both the social and individual viewpoint. Critical analysis of such problems as, the economists explanation of demand, relation of costs to the supply of products, the determination of prices under conditions of competition and monopoly, and differences in costs, between firms. Three credits; one meeting a week, first semester. Mr. Waite.
- *14. Statistics. Designed to familiarize students with the principles of statistical methods and their practical use in business. A study is made of the selection, tabulation, and interpretation of statistical data. The student is taught the construction and use of graphs, charts, and

- index numbers. Three credits; one meeting a week, first semester. Mr. Graves.
- *61. Salesmanship. A course for specialty men and traveling salesmen. Lectures and demonstrations on the principles underlying successful salesmanship, as follows: the proper approach, securing attention; arousing interest; creating desire; closing the sale; the use of suggestion in selling; the use of argument. The chief feature of the work will be the demonstration sales. So far as possible each student will be given an opportunity to take part in a sufficient number of demonstrations that he may apply the principles laid out in the course. No credit for degree, three credits for certificate in business; one meeting a week, first and second semesters. Mr. Conley.
- *73. Railway Traffic and Rates. A practical study of the Act to Regulate Commerce and the other laws and regulations covering the transportation of property, locally and in foreign commerce, both by rail and by water. The student is acquainted with the correct compilation and interpretation of freight tariffs and economical and efficient methods in shipping. The lectures are comprehensive and embrace rate-making bases, the classifying and tracing of freight, the preparation of claims, etc. Rulings of the Interstate Commerce Commission and of the various state commissions are referred to and rates are quoted from current tariffs and classifications. Six credits; one meeting a week, first and second semesters. Mr. Crellin.
- *88. Advertising A. An elementary course in advertising, covering: the development of advertising and the place of modern advertising in business; the appeals used in advertising; the principles of layout and arrangement, including proper placing of headlines, borders, and other display elements; typography; illustrations; and advertising copy. Students will be given practice in the layout of advertisements and writing copy. No credit for a degree, three credits for a certificate in business; one meeting a week, first semester. Mr. Conley.
- *88. Advertising B. A continuation of Advertising A. This course includes more intensive work in layout and copy writing with additional practice in these phases of the work; characteristics and selection of advertising media; the principles involved in the preparation of advertising campaigns, including the study of the product; analysis of the market and competition; the advertising appropriation; selection of media; methods of identification; co-ordinating with the complete campaign. No credit for a degree, three credits for a certificate in business; one meeting a week, second semester. Mr. Conley.

Department of Engineering Instruction

Purpose.—The General Extension Division now offers groups of courses in (1) architecture, (2) civil engineering, (3) electrical engineering, and (4) mechanical engineering. These groups are arranged to be completed in either three or four years and are planned primarily for persons who are already employed.

Engineering requires very thoro study. Mathematics is the foundation of the whole profession, and no step should be neglected. These courses have been laid out with care and are especially adapted to the needs of men working in shops and industrial establishments. They are planned so that such men may have added to their practical training a technical and theoretical knowledge which will enable them to advance more rapidly in their chosen line of work. These courses also offer an opportunity to college graduates who may wish to specialize in some subject not covered in their regular college work.

Credits and fees.—Courses in engineering do not carry credit towards a degree in the College of Engineering and Architecture except as a result of the comprehensive examinations conducted by the college, but do carry credit towards the Extension Division certificate. For detailed statement concerning credits and fees, see under General Information.

Preliminary course.—The following preliminary course is recommended and is usually taken by those who have not had a thoro training in higher algebra and physics before entering our regular course of study:

First Semester	Second Semester
Shop Mathematics I and II	Practical Physics I and II.
	Physics Laboratory I and II

The above courses no longer carry credit toward an engineering certificate.

Group course certificates.—Upon completion of 45 credits in any one of the groups of courses indicated above, a certificate in the group subject will be granted by the University of Minnesota. On completion of the entire four years' course a more advanced certificate will be issued. Students who have a preparation equivalent to two years of high school work, including physics and algebra, together with at least one year's shop experience, can obtain the certificate in less time. Requests for advanced standing must be accompanied by a transcript of the work done, otherwise the fitness of a student to omit any part of the work must be determined by a comprehensive examination in the subject for which he desires credit. At least 30 per cent of the credits toward certificates must be earned in the extension classes of the University of Minnesota.

The following groups of courses can be completed in four years by devoting the three evenings a week to class work. Students may, however, adapt the number of evenings a week to their own specific circumstances, bearing in mind that the minimum number of credits required for a certificate is 45.

Group course in architecture.—The course in architecture in the Extension Division affords a training in the general practice of architecture for those who are employed during the major part of their time and for teachers in the public schools. While adequate attention is given to structural studies, the course lays particular stress on the study of architectural design. It leads to a certificate in architecture on the completion of 45 credits, and an advanced certificate on completion of the full four years' course as outlined below.

FIRST YEAR

First semester.—Elements of Architecture I (3 credits); Free-Hand Drawing I (1½); College Algebra I (3).

Second semester.—Elements of Architecture II (3); Free-Hand Drawing II (1½); College Algebra II (3).

SECOND YEAR

First semester.—Architectural Design I (3); Free-Hand Drawing III (1½); Trigonometry I (3).

Second semester.—Architectural Design II (3); Free-Hand Drawing IV (1½); Trigonometry II (3).

THIRD YEAR

First semester.—Architectural Design III (3); History of Architecture I (3); Applied Mechanics (3) or Strength of Materials (3).

Second semester.—Architectural Design IV (3); History of Architecture II (3); Structural Design (3) or Reinforced Concrete (3).

FOURTH YEAR

First semester.—Architectural Design V (3); Theory of Engineering (3); Architectural Construction I (3).

Second semester.—Architectural Design VI (3); Heating and Ventilating (3); Architectural Construction II (3).

Group course in civil engineering.—The following course in civil engineering has been prepared for men who desire to specialize in this branch of the profession. It deals with the fundamentals of civil and structural engineering and is designed to fit men for either field or office work.

There are certain options allowed the student depending largely upon the work he intends to follow. This information must be furnished the Extension Division at the time the student registers and his options will then be given him.

FIRST YEAR

First semester.—College Algebra I (3); Mechanical Drawing (3); Highways and Pavements I, (3).

Second semester.—College Algebra II, (3); Structural Drafting (3); Highways and Pavements II, (3).

SECOND YEAR

First semester.—Trigonometry I (3); Applied Mechanics (3); Plane Surveying (3) or Map-Drawing (3).

Second semester.—Trigonometry II (3); Strength of Materials (3); Curves and Earthwork (3).

EXTENSION CLASSES

THIRD YEAR

First semester.—Analytic Geometry I (3); Reinforced Concrete (3); Theory of Engineering (3) or Hydraulics (3).

Second semester.—Analytic Geometry II (3); Reinforced Concrete Design (3); Theory of Engineering (3) or Structural Design I (3).

FOURTH YEAR

First semester.—Calculus I (3) or Railway Engineering I (3) or Cost Estimating (3); Advanced Structural Design (3).

Second semester.—Calculus II (3); or Railway Engineering II (3) or Municipal Engineering (3); Engineering Finance (3).

Group course in electrical engineering.—The purpose of this course is to give the student a foundation in the fundamental principles of electricity together with a sufficient knowledge of professional practice to enable him to apply them in his daily work. The course is designed with special consideration for those already employed in the electrical industries.

FIRST YEAR

First semester.—College Algebra I (3); Mechanical Drawing (3); Boiler Room Practice (3).

Second semester.—College Algebra II (3); Mechanical Drawing (3); Physics Laboratory.

SECOND YEAR

First semester.—Trigonometry I (3); Direct Current Machinery I (3); Direct Current Laboratory I (3).

Second semester.—Trigonometry II (3); Direct Current Machinery II (3); Direct Current Laboratory II (3).

THIRD YEAR

First semester.—Alternating Currents I (3); Analytic Geometry I (3); Alternating Current Laboratory I (3).

Second semester.—Alternating Currents II (3); Analytic Geometry II (3); Alternating Current Laboratory II (3).

FOURTH YEAR

First semester.—Calculus I (3); Applied Mechanics (3); Central Stations (3); Telephony (3) or Radio I (3); Electrical Machine Design I (3).

Second semester.—Calculus II (3); Strength of Materials (3); Electrical Power Transmission (3); Telephony (3) or Radio II (3); Electrical Machine Design II (3).

Group course in mechanical engineering.—The course in mechanical engineering is designed especially for men employed as operating engineers. It has been prepared and is taught by men who have had practical experience in their fields. There is a continual demand for operating men to fill executive positions and to meet this demand the following course has been prepared.

FIRST YEAR

First semester.—College Algebra I (3); Mechanical Drawing (3); Boiler Room Practice (3); Engineering English I (3).

Second semester.—College Algebra II (3); Mechanical Drawing (3); Engine Room Practice (3) or Engineering English II (3).

SECOND YEAR

First semester.—Trigonometry I (3); Advanced Mechanical Drawing I (3); Applied Mechanics (3).

Second semester.—Trigonometry II (3); Advanced Mechanical Drawing II (3); Strength of Materials (3).

THIRD YEAR

First semester.—Analytic Geometry I (3); Machine Design I (3) or Elementary Electricity (3); Steam Engines and Boilers (3) or Automotives (3) or Shop Methods (3).

Second semester.—Analytic Geometry II (3); Machine Design II (3); or Elementary Electricity (3); Heat Engines (3) or Advanced Automotives (3) or Foundry Practice (3).

FOURTH YEAR

First semester.—Calculus I (3); Advanced Mechanics (3); Heating and Ventilating (3) or Gas Engines and Producers (3) or Shop Management Problems (3).

Second semester.—Calculus II (3); Advanced Mechanics (3); or Steam Fitting (3) or Plumbing (3) or Gas Engine Testing (3).

Description of courses.—A detailed description of the courses in engineering offered through the Extension Division is given below.

ARCHITECTURE

14-15-16. Architectural History I. Sixteen lectures illustrated with lantern slides, covering the ancient and Renaissance periods. Suitable for students in architecture, teachers of art and history in high schools. Three credits; one meeting a week, first semester. Mr. Forsythe.

17-18-19. Architectural History II. Sixteen lectures illustrated with lantern slides, covering the medieval and modern periods. Suitable for students in architecture, teachers of art and history in high schools. Three credits; one meeting a week, second semester. Mr. Forsythe.

*24-25-26. Free-Hand Drawing I and II. For description, see Art, under Department of Collegiate Instruction. Three credits; one meeting a week, first and second semesters. Mr. Burton.

*27-28-29. Free-Hand Drawing III and IV. Continuation of I and II. For description, see Art, under Department of Collegiate Instruction. Three credits; one meeting a week, first and second semesters. Mr. Burton.

*31-32-33ex. Elements of Architecture I-II. Shades, shadows, wash rendering, and perspective. Architectural elements, doors, windows, moldings, and the architectural orders; general drawing, exercises, and lectures in the application of these elements to simple problems in design; a survey of architectural history illustrated by lantern slides. Open to students who have had mechanical drawing, to those who have had one year in an architect's office, or equivalent experience. Six credits; two meetings a week, first and second semesters. Mr. Forsythe.

*34-35-36. Architectural Design I-II. Regular Class B "Analytique" or order problems of the Society of Beaux Arts Architects, or equivalent designs in architectural problems from the regular course of the University of Minnesota. Open to those who have completed Course

- 31-32-33ex, or who have had two years in an architect's office, or equivalent preparation in an architectural school. Six credits; two meetings a week, first and second semesters. Mr. Forsythe.
- *‡37-38-39. Architectural Design III-IV. Class B, plan problems, and Class A, problems of the Society of Beaux Arts Architects, or equivalent design problems from the regular course in Architecture at the University of Minnesota. Open only to those who have completed the required "Analytique" or order problems, one or more years of design in any architectural school. Six credits; two meetings a week, first and second semesters. Mr. Forsythe.
- 51-52-53. Architectural Construction I-II. Nature and use of building materials—wood, brick, stone, concrete, steel, etc. Lectures. Six credits; one meeting a week, first and second semesters.
- ‡131-132-133. Architectural Design V-VI. Long, short, and sketch problems done under individual criticism dealing in general and more complex kinds of architectural composition with subjects involving special character and a decorative and imaginative interest. Prerequisite: Architectural Design III and IV. Six credits; two meetings a week, first and second semesters.

CIVIL ENGINEERING

- *11. Plane Surveying. Elements of plane surveying, methods of chain, compass, transit, and stadia surveys; leveling; field notes; determination of area of irregular plots; computation and plotting of field notes; care, use, and adjustment of instruments; methods of subdivision of the United States public lands. Prerequisite: Trigonometry. Three credits; one meeting a week, first semester. Mr. Cutler, Mr. Teeter.
12. Map-Drawing. Farm and city plats; real estate display maps; landscape architect's maps; topographic and hydrographic symbols. Prerequisite: Trigonometry and Plane Surveying. Three credits; one meeting a week, second semester. Mr. Zelner.
- *21-22. Curves and Earthwork. Mathematics of simple, compound, and spiral curves; preliminary and location surveys; plotting of profiles; vertical curves; cross sectioning and computation of earthwork volumes; methods of computation of overhaul; mass diagram, right-of-way and station ground maps. Prerequisite: Trigonometry and Plane Surveying. Three credits; one meeting a week, second semester. Mr. Cutler.
- *31-32-33. Structural Design I. Includes a treatment of structural mechanics and stress computation, and the elements of the principles and practice governing the design of tension and compression members, beams, girders, and columns. Prerequisite: an elementary working knowledge of mathematics through trigonometry, and some knowledge of elementary physics. Three credits; one meeting a week, first and second semesters. Mr. Maney.

‡ Regular instruction will be given on Monday and Thursday evenings, but students in these classes may work in the drafting rooms of the Architectural Department on other evenings, except Sunday.

142. Elementary Reinforced Concrete. A rapid review of the fundamental principles of beams and columns; elementary principles of reinforced beams, slabs, and columns. Prerequisite: Strength of Materials. Three credits; one meeting a week, first semester. Mr. Maney.
- *135. Reinforced Concrete Design. Studies and problems in the structural layout of various types of buildings. Various types of floor systems, columns, and footings calculated and studied to determine their desirability in specific cases. Three credits; one meeting a week, first semester. Prerequisite: Course 33. Mr. Maney.
- *146. Concrete Materials: Selection and Tests. The selection of materials for concrete, their properties, and the tests to be applied. A study of the proper combinations for lowest cost. Local materials will be used. Students make their own specimens and perform all the tests. Prerequisite: Shop Mathematics I and II. Three credits; one meeting a week, first semester. Mr. Lagaard.
- *147. Concrete and Steel Structures: Tests and Analysis. Study of the strength and carrying capacity of bridges and buildings; methods of testing in the field; special types of extensometers used and tests of laboratory models and buildings in actual service. Prerequisite: Course 146. Three credits; one meeting a week, first semester. Mr. Lagaard.
245. Advanced Reinforced Concrete Design. The theory and design of structures, for graduate students. Reinforced concrete arches, framed structures, continuous beams, culverts, and circular pipes, statically indeterminate methods, moments and shears, application of the most recent developments in reinforced concrete design methods and materials. Prerequisite: Elementary Reinforced Concrete. Three credits; one meeting a week, either semester. Mr. Parcel.
- *51-52. Highways and Pavements I-II. Elementary economics, location, construction, and maintenance of highways and pavements, a study of road-building materials and methods of testing with laboratory practice. Six credits; one meeting a week, first and second semesters. Mr. Lang.
53. Municipal Engineering I-II. Development of municipal public works. City-planning, transportation, and housing. The principles of public health and sanitation. Public water supplies, sewerage and sewage disposal, refuse collection and disposal, and the sanitation of buildings. Prerequisite: Hydraulics. Six credits; one meeting a week, first and second semesters. Mr. Bass.
129. Hydraulics. Mechanics of liquids, pressure in pipes, on gates and dams, flow through pipes and open channels, water hammer; the basic principles of centrifugal pumps and water wheels. Prerequisite: Strength of Materials and Trigonometry. Three credits; one meeting a week, first semester. Mr. Teeter.
162. Water Power and Elements of Hydrology. Types of low, medium, and high head developments. Details of developments; spillway dams; hollow reinforced concrete dams, arch dams, high masonry dams, mov-

able dams. Turbine settings and characteristics. Prerequisite: Hydraulics. Six credits; one meeting a week, first and second semesters. Mr. Teeter.

ELECTRICAL ENGINEERING

- *111-113. Direct Current Machinery I-II. Elementary electricity, the simple laws of magnetism, the theory of direct current machinery; direct current motors and generators, armature windings, commutation, and wiring diagrams; of value to those who work with direct current apparatus, a foundation for the study of alternating current machinery and power plants. Prerequisites: Practical Physics and Trigonometry. Six credits; one meeting a week, first and second semesters. Mr. Todd.
- *112-114. Direct Current Laboratory I-II. A course of experimental work to aid in understanding direct current theory. The laws of magnetism and direct current circuits illustrated in experiments performed by the student himself. Machine characteristics for several types of motors and generators. Prerequisite: registration in Direct Current Machinery, Practical Physics, and Trigonometry. Six credits; one meeting a week, first and second semesters. Mr. Swenson.
- *121-123. Alternating Currents I-II. An elementary course in alternating current circuits and machines; series and parallel circuits, single and polyphase systems, power and power factors, transformers, induction motors, alternators, synchronous motors, rotaries, single phase motors, and transmission lines. Prerequisite: Direct Current Machinery and Direct Current Laboratory. Six credits; one meeting a week, first and second semesters. Mr. Ryan.
- *122-124. Alternating Currents Laboratory I-II. Supplementary to Alternating Currents 121-123-125. An experimental study of alternating currents, regulation and efficiency tests of alternators, transformers, motors, and rotaries. Prerequisite: registration in Alternating Currents 121-123-125. Six credits; one meeting a week, first and second semesters. Mr. Kuhlmann.
- 132-134. Electrical Machine Design I-II. The design of transformers, alternators, motors, and generators, the calculation of all dimensions and predetermination of operating characteristics. Prerequisite: Alternating Currents I-II, Mathematics VI, and Mechanical Drawing II. Six credits; one meeting a week, first and second semesters. Mr. Kuhlmann.
- 141. Central Stations. (Not offered in 1925-26.)
- 142. Electrical Transmission. (Not offered in 1925-26.)
- 143. Electric Vehicles. For truck owners, drivers, and garage men. Transportation engineering; cost analysis; the field for electric trucks in city transportation; principal types of electric trucks; general theory of motor and battery; study of motor, controller, and charging equipment; storage batteries and their care as applied to electric trucks; maintenance and operation. Prerequisite: experience with gas or

- electric trucks. Three credits; one meeting a week, first semester. Mr. Greiner.
63. Telephone Apparatus. Nature of voice sounds, frequency, and wave length. Construction and operation of receivers, transmitters, inductance and repeating coils, and the electromagnet as used in telephony. Primary and storage batteries ringing machines, and pole changers. Signaling equipment, including magnetos, ringers, and central energy lamp or visual signals. The treatment will be elementary, using only simple mathematics. Prerequisites: Direct Currents 115-116, Alternating Currents 125-126, Trigonometry, and Mechanical Drawing II. Three credits; one meeting a week, first semester. Mr. Swenson.
65. Telephone Circuits. Subscribers' sets for magneto and common battery exchanges; magneto and common battery circuits; circuit and blue print reading; cable codes, cable- and line-testing; inductance and capacity of lines, aerial and cable construction; traffic studies, and multiple switchboard arrangements. Prerequisite: Course 63, or its equivalent, Mechanical Drawing II. Three credits; one meeting a week, second semester. Mr. Swenson.
- *66. Radio Communication I. Analysis of the theory and operation of radio transmitting and receiving circuits, with emphasis on the various types of receiving sets now in use; economic status of radio communication. Prerequisite for credit: College Physics and Trigonometry or equivalent. Three credits; one meeting a week, first semester. Mr. Swenson.
- *67. Radio Communication II. Continuation of prerequisite Course 66 or equivalent. Three credits; one meeting a week, second semester. Mr. Todd.

ENGINEERING DRAWING

- *1-2. Elementary Mechanical Drawing I-II. A beginning course in drafting; use of instruments and drawing materials, lettering, tracing, view-drawing, dimensioning and working drawings of machine parts. Six credits; one meeting a week, first and second semesters. Mr. French.
- *45ex. Teachers' Course in Mechanical Drawing I-II. A special course offered to those who teach drawing in grade and high schools and who wish better to acquaint themselves with standard drafting room practice. Six credits; one meeting a week, first and second semesters. Mr. French.
- *46ex. Mechanical Drawing for Women I-II. Similar to Course 1-2, with more emphasis on lettering and tracing at the option of the student. Six credits; one meeting a week, first and second semesters. Mr. French.
- *47ex. Cost Estimating I-II. Plan-reading and cost-estimating of buildings, bridges, culverts, roads, pavements, etc.; analysis of the cost of concrete, steel, timber, and brick construction, piling, transportation, equipment rental, overhead and general costs; cost estimates of buildings, bridges, culverts, etc. Lectures, classroom problems, and discussions. A drawing outfit is not needed, but working knowledge of

- blue print reading is desirable. Six credits; one meeting a week, first and second semesters. Mr. French.
- *48ex. Plan Reading and Sketching. An elementary course of lectures and plan reading exercises for those who wish to obtain a knowledge of plan reading without a regular course in mechanical drawing. No drawing outfit is required. Interpretation of drawings of castings and machine parts, structural steel and concrete building, bridge plans, maps and topographical drawings, architectural plans of houses and larger buildings. No credit; one meeting a week, both semesters. Mr. French.
54. Advertising Lettering. A study of lettering as applied to commercial advertising; analysis of advertisements; design of small space ads; trips to commercial firms where etching, engraving, lithographing, etc., can be observed. Prerequisite: Any lettering experience. One credit; one meeting a week, first semester; repeated in the second semester. Mr. Levens.
- *15. Structural Drafting. A practical course in structural detailing of various types of girders, columns, and roof trusses. Complete drawings of frame, mill, bent, and other structures. The solution of problems of simple structures. Prerequisite: Mechanical Drawing I. Three credits; one meeting a week, first semester; repeated in the second semester. Mr. Herrick.
- *31-32. Advanced Mechanical Drawing I-II. A practical course in drafting and drafting room methods taking up the detail of machine parts, such as fastenings, screws, bolts, rivets, and rivet joints; keys, cotters, and pins; pipe and pipe-fastenings; bearings and journals, pulleys and belting; spur gears, bevel gears, and spiral gears; cams, link motions, etc.; the application of empirical design and the principles of mechanics; assembly, diagrammatic and layout drawings. It is assumed that the student has a previous knowledge of drawing equivalent to Course 1-2. Six credits; one meeting a week, first and second semesters. Mr. Herrick.
- 32ex. Gear Drawing. A course in development of gear teeth by the drafting room method. Study of curves used in gear teeth, sprockets, and chain wheels. Layouts of involute, cycloidal, and other forms for spur, annular, stub, bevel, worm, spiral, herringbone, and various other types of gear. Simple calculations to determine pitch, number of teeth, pitch diameter, etc. Prerequisite: Mechanical Drawing 31 or its equivalent. Three credits; one meeting a week, first or second semester. Mr. Herrick.
- *33. Mechanism and Kinematics. A study of motion without the consideration of the strength of parts; levers, gearing, linkwork, kinematic pairs; machine parts; construction of tooth profiles; paths and velocities of mechanism. Prerequisites: a previous knowledge of drawing equivalent to Course 1-2. Three credits; one meeting a week, first or second semester. Mr. Herrick.

- *35-37. Machine Design I-II. An elementary course in the calculation and design of machines and machine parts, such as machine frames, shafting, flywheels, pulleys, riveted and screwed fastenings, bearings, spur gearing, bevel gearing, and helical gearing. Lectures and drawing room practice of practical problems. Prerequisites: previous knowledge of drawing equivalent to Course 1-2, and mathematics through Trigonometry; a working knowledge of Elementary Physics and Strength of Materials is desirable. Six credits; one meeting a week, first and second semesters. Mr. Herrick.

MATHEMATICS AND MECHANICS

For other courses in mathematics, see under that heading in the Department of Collegiate Instruction.

- *7. Shop Mathematics I and II. A general review of all elementary mathematics through geometry. Designed as an introductory course to meet the needs of anyone who wishes to take up engineering work of a higher grade. The course covers fractions, decimals, percentage, weights of materials, areas and volumes, thread-cutting, gearing, belts and pulleys, the milling machine, and a general drill in equations and the use of formulae, elements of algebra, and plane geometry; two meetings a week, first and second semesters. Mr. Teeter, Mr. Edwards, Mr. Boehnlein.
- *11. College Algebra I and II. A course of college grade in fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, indeterminate equations, ratio, proportion, variation, theory of equations, Horner's and Newton's methods. Textbook: Hall and Knight. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Edwards, Mr. Wilcox.
- *12. Trigonometry I and II. A course of college grade in trigonometry. A study of angles, trigonometric functions, plane right triangles, reduction formulae, fundamental relations, other trigonometric relations, identities and equations. Inverse functions, plane oblique triangles, De Moivre's theorem, trigonometric functions used in spherical trigonometry, spherical right triangles, quadrantal triangles. Textbook: Bauer and Brooke's, *Plane and Spherical Trigonometry*. Prerequisite: college algebra. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Edwards, Mr. Priester.
- *13. Analytic Geometry (plane and solid) I and II. Of great importance to the engineering student who wishes to take up the study of calculus. The straight line, circle, ellipse, parabola, hyperbola, tangents, normals, rotation of axes, and a few of the higher plane curves met with in practice. Space co-ordinates, plane, line and quadric surfaces, cylinders, and space curves. Prerequisite: Trigonometry I and II. Six credits; one meeting a week, first and second semesters. Mr. Teeter, Mr. Edwards.

- *24. Calculus I. Rules for differentiation. The various derivatives and their application to tangents, normals, evolutes, involutes, and maximum and minimum. Engineering examples will be given whenever possible. Prerequisite: Analytic Geometry I and II. Three credits; one meeting a week, first semester. Mr. Edwards.
- *25. Calculus II. A continuation of Mathematics VI, taking up the standard forms of integration, special methods of integration. Important mechanical and electrical problems will be introduced and discussed in class. Prerequisite: Calculus I. Three credits; one meeting a week, second semester. Mr. Teeter, Mr. Edwards.
- *151. Differential Equations I and II. For description see under Department of Collegiate Instruction.
- *50ex. Practical Physics I and II. Lectures and experimental demonstrations in general physics, designed to meet the needs of technical students and to be of value in understanding the machinery of everyday life. The subjects treated primarily are mechanics, heat and electricity; but geometrical optics, sound, and the general principles of radioactivity, X-rays, and vacuum tubes will also be taken up. This course should be taken in conjunction with Course 51ex. Two meetings a week, each semester. Mr. Buchta.
- *51ex. Practical Physics: Laboratory I and II. Experiments by the student illustrating the principles taught in Physics 50ex. This course should be taken with the preceding one as it is of great value in understanding the fundamental ideas and their applications. One meeting a week, second semester. Mr. Buchta.
- *30ex. Elementary Applied Mechanics. A short practical course in the action of forces in engineering structures, for students who have limited mathematical training. It includes numerical calculations, simple graphical calculations, forces, simple mechanics, work, power, and energy. Prerequisites: Mathematics II and Physics I. Three credits; one meeting a week, first semester. Mr. Teeter, Mr. Brooke.
- *33ex. Strength of Materials. An elementary course designed to follow the course in applied mechanics. The subject includes the properties of materials, stress and strain, elastic and ultimate strength, deformations, principles of moments, moments of inertia, simple stresses, shear, riveted joints, the general elementary theory of beams, columns, and shafts. Prerequisites: Applied Mechanics and Mathematics IV. Three credits; one meeting a week, first or second semester. Mr. Brooke.
- *126. Advanced Mechanics I. Statics, resolution of force, moments, theory of couples, conditions of equilibrium, free body method, catenary, and allied subjects. Prerequisite: Calculus I and II. Three credits; one meeting a week; first semester. Mr. Wilcox.
- *127. Advanced Mechanics II. Dynamic of particles and of rigid bodies, center of gravity, moment of inertia, kinematics of circular, harmonic, and curvilinear motion in general, work, energy, and power. Pre-

requisite: Advanced Mechanics I. Three credits; one meeting a week, second semester. Mr. Wilcox.

141. Testing of Materials. (Not offered in 1925-26.)

MECHANICAL ENGINEERING

- *1ex. Metallography and Heat Treatment of Iron and Steel. A beginning course including lectures, demonstrations, and laboratory work, pyrometry, thermal analysis, preparation of alloys, microscopic examination of metals and alloys and the preparation of photo-micrographs, the theory of heat treating, and its relation to practice. Suitable for those engaged in the practical heat treatment of iron and steel and for those who are writing specifications, purchasing or selling iron and steel. Three credits; one meeting a week, second semester. Mr. Harder.
- 40ex. Steam Fitting. Covers steam-using machines and equipment with particular emphasis on heating appliances and refrigerating machines. Three credits; one meeting a week, first semester. Mr. Martenis.
- *42. Boiler Room Practice. Designed for the benefit of persons who have charge of boiler plants; of value to janitors in charge of schoolhouses and apartment houses, as well as factory boiler shops. It will also be of benefit to those who are expecting to obtain licenses as boiler inspectors. Three credits; one meeting a week, first semester. Mr. Martenis.
- *43. Engine Room Practice. A continuation of the preceding course, taking up the subject of the steam engine and its accessories. This course is of value to those seeking a chief engineer's license. Three credits; one meeting a week, second semester. Mr. Martenis.
- *153. Heating and Ventilating. A course covering present heating and ventilating practice for heating contractors and others desirous of obtaining a fundamental knowledge of the subject; the study of heat; methods employed for heating and ventilating buildings; piping systems and temperature regulation. Three credits; one meeting a week, first semester. Mr. Martenis.
- *41. Elementary Automobiles. A course intended to acquaint men and women in a simple way with the mechanism of a motor car, intelligently to purchase and operate it, and more economically to analyze and remedy troubles. Illustrated lectures and laboratory demonstrations, with discussions of the engine, lubricating and cooling systems, gasoline and carburetors, ignition and starting systems, the storage battery, the chassis, transmission, axles, etc., tires, cost of operation, and other kindred subjects. Three credits; one meeting a week, first or second semester. Mr. Hazen.
150. Gas Engines. A practical course in the theory of construction and operation of the gas engine. It includes various types of engines, cycles, ignition, carburetion, cooling, oiling, methods of determining horse power, etc. Three credits; one meeting a week, first semester. Mr. Rowley.

183. Gas Engine Testing. A practical laboratory course in gas engine testing in which the student performs tests on the various types of gas engines such as stationary oil and kerosene-burning engines, and automobile, airplane, and tractor motors. Students will keep records of the various tests in their notebooks. Prerequisite: Gas Engines, Course 150. Three credits; one meeting a week, second semester. Mr. Rowley.
82. Steam Engine and Power Plant Testing. Intended for stationary engineers who wish to become more efficient in their line of work. The course will consist of lessons supplemented by experimental demonstrations. Actual problems arising in power plant testing will be worked out in class, with explanations and instructions for their solution. The laws of mechanics, heat, power, work, and energy will be applied to engine and power plant testing. Three credits; one meeting a week, first semester. Mr. Shoop.
144. Elementary Thermodynamics. An elementary course required of all engineering students, relating to properties of steam heat engines; the steam engine and boiler; the steam turbine, and the gas engine. The general problem of a modern power plant is considered for the benefit of those who do not devote further time to the subject. Three credits; one meeting a week, second semester. Mr. Edwards.
151. Thermodynamics. Advanced mechanical theory of heat as applied to steam, oil, and gas engines and gas producers, compressors, injectors, reheaters, and refrigeration apparatus. Prerequisite: Strength of Materials, Calculus. Three credits; one meeting a week, second semester. Mr. Shoop.
124. Foundry Practice I-II. A semi-technical course dealing with everyday foundry problems from a technical standpoint; designed to link up the practical with the technical in the simplest manner possible. It will appeal especially to foremen, clerks, mechanics, and other persons interested in foundry practice who have had the equivalent of a common grade school education. The course covers drawing, materials, metallurgy, sands, refractories, fluxes, foundry economics, foundry machinery, and office practice. Six credits; one meeting a week, first and second semesters. Mr. Potter.
- 58ex. Shop Methods. The practical application of shop mathematics to metal-cutting machines. Screw-cutting, gear and milling cutter calculations. Lectures and demonstrations. Three credits; one meeting a week, first semester. Mr. Shipley.

COLLATERAL COURSES

3. Engineering Finance. Primary basis of price; fixed charges and operating costs; depreciation and appreciation; obsolescence, inadequacy, uselessness; fundamental financial calculations; basic costs and "vestances;" unit cost determination; size of systems for best financial efficiency. Prerequisites: registration in calculus and physics. Three credits; one meeting a week, second semester. Mr. Teeter, Mr. Edwards.

- 51ex. English for Engineers I and II. A course in practical English, designed to meet the professional needs of engineering students. The material of this course will include business letters—about twelve types; reports; estimates; instructions, etc. Some attention will be given to oral English. Six credits; one meeting a week, first and second semesters.
7. Law for Engineers A. Personal and ethical relations; rights and remedies; agreements and contractual relations; proposals, advertising and letting of contracts; competency of parties; mutuality of obligations; legality; specifications and construction; evidence; authority of agents; employment; workmen's compensation acts. Three credits; one meeting a week, first semester. Mr. Smiley.
8. Law for Engineers B. Property, real and personal; sales; carriers and storage; land laws; surveys and boundaries; rights of way and water rights; negligence and damages; engineer's legal relations. Three credits; one meeting a week, second semester. Mr. Smiley.

Extension Certificates Granted, 1924-25

CERTIFICATES IN ACCOUNTING

Martin Anderson	George F. Julicher
Anna R. Burbey	Joseph Lazarus
John Arthur Herbert Carlson	Helmer Olaf Lindroth
Martin William Decker	James Buchanan Nelson
George Frederick Feller	Herbert S. Nordin
Norman Walter Grant	M. Martha Rishmueller
Irma Henrietta Haake	Harold E. Sandahl
Selma Harlis	Leslie James Schoenig
Joseph Harris	Clarence J. Swalen
Edward Louis Hinze	

CERTIFICATES IN GENERAL BUSINESS

Martin Anderson	Joseph Lazarus
Anna R. Burbey	Elmer Lindborg
Selma Harlis	Leo John Thomas
Clara A. Kjelsberg	

CERTIFICATES IN FINANCE

F. Lawrence Durand	Paul J. Huber
Raymond W. Egan	Orval Willis Morris
Ralph H. Hegman	

CERTIFICATES IN ENGINEERING

Fred Clarence Johnson (Mechanical) Ben Ominsky (Electrical)
 Elmer Carl Suther (Electrical)

CERTIFICATE IN ACCOUNTING

Granted in June, 1924

Jafet Marjamaa

Summary of Student Semester Registrations, 1924-25

Minneapolis collegiate	2,360	
Minneapolis business	1,356	
Minneapolis engineering	1,048	
St. Paul collegiate	879	
St. Paul business	674	
St. Paul engineering	139	
Duluth collegiate	961	
Duluth business	247	
Duluth engineering	181	
Hibbing collegiate	148	
Eveleth collegiate	16	
Faribault business	68	
Virginia collegiate	152	
Virginia business	49	
Two Harbors collegiate	37	
Total number of student semester registrations.....		8,315
Total number of individuals taking work 1924-25....		4,599
Total collegiate registrations	4,553	
Total business registrations	2,394	
Total engineering registrations	1,368	

Extension Service

The Extension Service of the University of Minnesota is organized to include the following:

A. THE GENERAL EXTENSION DIVISION

- I. Extension classes in Minneapolis, St. Paul, Duluth, and other cities.
 1. Courses in Collegiate Instruction leading to credit in the College of Science, Literature, and the Arts, in the College of Education, and in the School of Business.
 2. Courses in Business Administration, Accounting, and Finance leading to certificate and also to University credit.
 3. Practical courses in Engineering and in Industrial Subjects leading to certificates.
- II. Correspondence courses in each of the three groups of subjects above, totaling about 200 courses. (Special bulletin sent on request.)
- III. Municipal Reference Bureau, which compiles and furnishes to city officials information pertaining to municipal government and administration.
- IV. Community Service Department, with its subdivisions for (1) Extension lectures, singly or in groups; (2) Lyceum lectures, concerts, and entertainments; (3) Visual Instruction, through loan collections of lantern slides and films; (4) Drama Service, to aid clubs and school societies in the selection and production of amateur theatricals; and (5) Community Organization, through community institutes formed with the co-operation of a special adviser from the Extension Division. (Special bulletin sent on request.)
- V. Short Courses at the University of from one to twelve weeks for graduate dentists, retail merchants, bankers, and in such subjects as embalming, playground supervision, citizenship (for women voters), etc.

B. AGRICULTURAL EXTENSION DIVISION

Agricultural Extension includes lectures, demonstrations, institutes, and short courses under the direction of the College of Agriculture, Forestry, and Home Economics.

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

Correspondence Courses
Announcement for the Year
1925-1926



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CORRESPONDENCE COURSES

FACULTY

Lotus Delta Coffman, Ph.D., LL.D., President
William Watts Folwell, LL.D., President Emeritus
Richard R. Price, Ed.D., Director of University Extension
William C. Smiley, LL.M., Head of Correspondence Study Department

William Anderson, Ph.D., Professor of Political Science
Roy G. Blakey, Ph.D., Professor of Economics
Gisle C. Bothne, M.A., Professor of Scandinavian Languages and Literatures
Ruth E. Boynton, B.S., M.D., Director, Division of Child Hygiene, State Board of Health
Oscar C. Burkhard, Ph.D., Professor of German
Edward G. Cheyney, B.A., Professor of Forestry
Robert V. Cram, Ph.D., Assistant Professor of Latin
James Davies, Ph.D., Assistant Professor of German
Manuel C. Elmer, Ph.D., Associate Professor of Sociology
Oliver C. Edwards, B.S., M.E., Assistant Professor of Mechanical Engineering, General Extension Division
Ross L. Finney, Ph.D., Assistant Professor of Educational Sociology
William S. Foster, Ph.D., Professor of Psychology
Jules T. Frelin, B.A., Assistant Professor of Romance Languages
Robert W. French, B.S. (C.E.), Associate Professor of Drawing and Descriptive Geometry
John M. Gaus, Ph.D., Associate Professor of Political Science
Alvin H. Hansen, Ph.D., Professor of Economics
Samuel Kroesch, Ph.D., Professor of German
Gustav A. Lundquist, Ph.D., Assistant Professor of Rural Sociology
George F. Lussky, Ph.D., Assistant Professor of German
John V. Martenis, M.E., Associate Professor of Machine Design
Walter R. Myers, Ph.D., Assistant Professor of Economics
Charles W. Nichols, Ph.D., Assistant Professor of English
Joseph B. Pike, M.A., Professor of Latin
Harold S. Quigley, Ph.D., Professor of Political Science
Albert W. Rankin, B.A., Professor of Education, Retired
Charles A. Savage, Ph.D., Professor of Greek
Carlyle M. Scott, Professor of Music
Edward H. Sirich, Ph.D., Associate Professor of Romance Languages
William C. Smiley, LL.M., Assistant Professor of Business Law, General Extension Division
J. Warren Stehman, Ph.D., Associate Professor of Economics
Andrew A. Stomberg, M.S., Professor of Scandinavian Languages and Literatures

CORRESPONDENCE COURSES

- Emerson G. Sutcliffe, Ph.D., Assistant Professor of English
Thomas A. H. Teeter, B.S. (C.E.), Associate Professor of Engineering.
General Extension Division
- Wilson D. Wallis, Ph.D., Associate Professor of Anthropology
J. Franklin Ebersole, M.A., Ph.B., Professorial Lecturer in Economics
Jean H. Alexander, M.A., Instructor in History and Philosophy of
Education
- Reuel R. Barlow, B.A., Instructor in Journalism
William O. Beal, M.S., M.A., Instructor in Astronomy and Assistant
Astronomer
- Charles LeRoy Conley, B.A., Instructor in Business, General Extension
Division
- Ralph H. Farmer, B.A., Instructor in Economics
Adah G. Grandy, B.L., Instructor in English
Leah Miller Hanley, B.S., Instructor in Art, General Extension Division
Ralph T. Huntley, B.A., Instructor in Political Science
Paul C. King, B.A., Instructor in Romance Languages
Otto F. Kuhlman, M.A., Instructor in Economics
Sophia H. Patterson, M.A., Instructor in English, University High School
Stanley H. Perry, B.A., Assistant in History
Jean L. Selvage, B.A., Instructor in English, General Extension Division
Homer J. Smith, Ph.B., M.A., Instructor in Trade and Industrial
Education
- George W. Swenson, M.S. (E.E.), Instructor in Telephone and Telegraph
Engineering
- W. Bayard Taylor, M.A., Instructor in Economics
Louis A. Tohill, M.A., Instructor in History, University High School
Nina L. Youngs, B.A., Instructor in Business

GENERAL INFORMATION

CORRESPONDENCE STUDY

The last few years have demonstrated the effectiveness of university teaching by correspondence. The foremost American universities have recognized this opportunity for specific service. In thus extending its functions, the University offers a plan of practical instruction whereby preparatory, vocational, and collegiate training is made available to those who of necessity must devote a part of their time to other duties. Teaching by correspondence thus has become a part of the state educational system. It now is possible to contribute largely to the requirements for a Bachelor's degree by combining work in residence at the University Summer Session with correspondence study under the General Extension Division.

ADVANTAGES

Correspondence study accommodates itself to a person's spare time, enabling him to make valuable use of short periods which would otherwise be wasted; it permits him to carry on work in a field of study in which he has a special interest, to prepare for special occupations, to broaden his intellectual outlook, or to make up defects in his education.

The student recites on every part of every lesson and receives the individual attention of the teacher in the correction of the papers he submits. Since a student is not hurried in his work, but may within reasonable limits take as much time as he needs for the preparation of a lesson, he can master the material thoroly.

THE INSTRUCTION

Upon the receipt of the application and fee for any course the first lessons are sent, together with instructions for the preparation of lessons and directions for making reports.

The teaching is done by teachers from the various faculties in the University who are in continuous charge of similar courses in residence and who are familiar with the needs of non-resident students.

Each lesson contains questions to test the student's methods of work as well as his understanding of the ground covered. After preparing for recitation, the student writes his answers to the questions and returns them, together with a statement of any difficulties which may have arisen during his study.

Each recitation report is returned to the student with such corrections, explanations, and suggestions as may be needed. It is expected that these will be carefully gone over. Lists of books, assignments for reading, and all necessary assistance will be furnished throughout the course, so that the student at no time will be left without adequate aid and guidance. Questions on the subject in hand are at all times encouraged.

THE UNIT COURSE

The unit course is divided, where practicable, into twenty-seven lessons, representing a five-credit course for one quarter in residence. Such

a course represents an amount of work equal to that done in residence at the University in a study of five full recitation hours per week for one quarter. It is assumed that this work may be done by the average student in twenty-seven weeks with a minimum leisure for study of one hour per day, six days in the week. Variations from the unit course are indicated by the number of credits, or by the number of lessons when university credit is not allowed. Two lessons in correspondence approximately cover the ground in quantity of a week's work in residence.

Preparatory courses are arranged so that each lesson covers approximately the equivalent of a week's work in high school.

SELECTION OF COURSES

In selecting courses for university credit, the student should conform to the prescribed course of study of each college. It is advisable for such students to secure a copy of the bulletin of the college which they expect to enter, in order to find out what subjects are prescribed. The bulletin of any of the colleges of the University may be secured by addressing the registrar, University of Minnesota, Minneapolis.

PREPARATORY COURSES

This department now offers a variety of courses for entrance credit. These are sometimes spoken of as "high school" or "subfreshman" courses. They enable students to make up deficiencies in their preparatory work by home study or to do all or a major portion of it through this means.

To qualify for admission to the University a candidate must present a minimum of fifteen units or thirty credits in specified subjects. The particular subjects required differ with the various colleges but all include four units of English, two or more of mathematics, and enough additional units to make up the total of fifteen. Specific information in this regard may be obtained from the University bulletin of general information.

Ordinarily a candidate must pass entrance examinations in each of the required subjects, but there are some exceptions to this rule. Certificates from the College Entrance Examination Board, or from the Minnesota State High School Board are accepted in lieu of examinations in the subjects they represent. Graduates of accredited preparatory or high schools who show a record of having passed in the required fifteen units may be admitted without examination, *but non-graduates can not make use of credits obtained in such schools.* Finally, candidates who hold entrance credits from this department are not required to submit to further examination in the subjects so passed. For list of courses see pages 12-17.

Certain subjects, such as the elementary courses in languages, may be taken either for entrance or for collegiate credit, but not for both, that is, a subject which is presented for entrance credit can not be repeated by the same student for collegiate credit. A high school unit represents five classroom periods each week for a school year and consists of two credits, each representing a half year of work. A college credit represents one

classroom period each week for a quarter. Making allowance for the greater length of the college period and the more intensive nature of the work required, the ratio is about ten to one. This means that when the same course is offered either for entrance or for college credit, a nine- or ten-credit college course will carry but one entrance unit.

Whether a state teachers' college or a local high school will accept the entrance or "high school" credits obtained from this department and apply them toward a diploma, and the extent to which such credits will be accepted and applied, depends entirely upon the rules of the school concerned. Many of them are known to accept such credits and none has been reported as refusing to do so, but this is a matter over which the University has no jurisdiction. Therefore, students who expect to make use of credits in this way should first make sure of the attitude of the school in which it is sought to apply them. No registration for entrance credit will be accepted from a student who is at the same time enrolled in a secondary school, except upon written permission from that school. The University does not grant a high school diploma for work done by correspondence.

BOOKS AND OUTFIT

All necessary textbooks, drawing outfits, and apparatus are extra and *must be procured by the student*. Money should *not be sent* to the University for the purchase of texts and other material. When ordering textbooks, the student should give the exact title, the author, and the publisher. The student pays postage on lessons one way.

Some reference books may be borrowed from the university library. This privilege does not apply to the necessary textbooks. The period of loan is one month. The student is expected to pay express or postage both ways. Requests for such reference books should be addressed to the librarian, University of Minnesota, Minneapolis, and the student should state explicitly what books are desired, with the author's name, title of the book, and the volume number, naming the course in which they are to be used and giving full instructions for mailing. Blanks are supplied for this purpose.

No list of textbooks is published by the department.

PROCEDURE

The student who wishes to undertake correspondence study should first select such course or courses as he may desire to take and send for an application blank if he has not already obtained one. All applications must be made on the blank furnished by the department. He should fill out the blank with all the information called for and return it with the required fee to the Correspondence Study Department, General Extension Division, University of Minnesota, Minneapolis.

HOW TO SEND MONEY

Payment should be made by post-office or express money order, personal check, or draft. *Make all checks and orders payable to the University of Minnesota*. They should cover the exact amount of the fee, no more and no less.

REGULATIONS

ADMISSION

All persons who seem qualified to pursue successfully the courses offered will be admitted to registration without formal examination. The student is required to fill out an application blank giving all the information asked for in order that his fitness to pursue the course selected may be determined. It is desired that the student state fully the purpose he has in view in taking the work and give in detail the educational advantages, training, or experience he may have had. The department endeavors to meet the needs of the individual student by advice and suggestions, as well as by formal instructions, but whenever it finds that the courses selected are not for the best interests of the student, it reserves the right to reject the application or to advise change. It also reserves the right to advise discontinuance or change after a course has been started, if the student shows entire unfitness for the work. Whenever a registration is discontinued in this way or rejected the fee will be returned.

TIME

Students may begin a correspondence course at any time during the year and will be required to complete the course within twelve months from the time of enrolment, but the department *can not guarantee that all courses will be given during the summer months*. During an instructor's vacation, a substitute will be provided to carry on such course or courses, if possible, or the time for completing the course will be extended.

Each recitation report must be sent in as soon as it is completed. The practice of sending several reports at one time causes confusion and delay. Four recitation reports in a subject is the maximum number which will be accepted by the University from a student in any single week. Subject to this regulation the student may work as rapidly as he desires providing his work is satisfactory.

As a rule the student should endeavor to send in at least one recitation report every week. If it is not possible to do this the department should be notified. Temporary delays are, however, unavoidable in a busy person's work, and no student should become discouraged because of them.

RETURN OF ENGLISH PAPERS

After the student has noted the instructor's corrections and comments on lesson reports in English, all such papers must be returned for permanent filing in this office. On and after October 1, 1925, no credits in English will be recorded until all such papers are on file. This regulation refers solely to students' manuscripts, and does not require a return of the lesson sheets.

NUMBER OF COURSES CARRIED

Not more than two courses may be carried through correspondence at one time.

FEES

All fees are payable at the time the student files his application for registration. No reduction of fee is made for a combination of courses carried simultaneously. The fee for each course may be found in the lists of courses, pages 12-17.

REFUNDS

Two dollars (\$2) of each fee is the non-refundable portion withheld to cover expenses of registration. No fee will be refunded after two months from the date of registration or after the student has completed one half of the course for which he has registered. If an application for instruction is rejected the entire fee is returned.

REINSTATEMENT

Any student whose registration has expired, or who has failed to complete a course within the prescribed time of one year, through causes not within the control of the University, may be reinstated with the consent of the department on payment of one dollar for each course reinstated, but no reinstatements will be granted after a lapse of three years.

CREDIT

Students who undertake correspondence study work for university credit must state this fact in advance and comply with all requirements of the University, including the prerequisites for each course. University credits allowed in this connection will be recorded separately until the student matriculates at the University, when they will be recorded permanently as university credits. Registrations for credit will not be accepted unless evidence is given that university entrance requirements can be met. These requirements are usually comprised in a four-year high school course.

Those seeking a university degree must conform to all the requirements exacted by the college or school in which such degree is sought. The bulletin of any college or school may be obtained from the registrar.

A maximum of one half of the required credits for the bachelor of arts degree may be accumulated through correspondence. The work of the earlier part of the course is more likely to be available for correspondence study. The work of the senior year, or the major portion of it, must be done in residence.

Normal students who undertake courses for university credit with the purpose of having the credit transferred to the teachers' college in which they are working for a diploma should make certain by consultation with the proper authorities at the teachers' college that the arrangement to do this is satisfactory and that the course selected fits into their program.

Entrance credit is allowed for courses of high school grade. See Preparatory Courses, page 6.

No credits may be earned by correspondence study to apply on the Master's degree, or any other graduate degree.

Notice of completion with or without credit, as the case may be, is sent by the university registrar to each student who satisfactorily completes a course.

TRANSFER OF CREDITS

Credits obtained through work with this department will be certified to other schools or colleges upon request, but it must be understood that their acceptance by another institution depends wholly upon the regulations of that institution. Students who expect to apply our credits elsewhere should first make sure of the rules of the other school or college.

A "credit" does not mean the same thing in different institutions respectively and hence a transfer of credits usually involves the calculation of credit equivalents. A University of Minnesota credit now means one fifty-minute classroom period per week for a "quarter," or twelve weeks. Formerly it meant the same quantity of classroom work per week for a "semester" of seventeen weeks. Three "quarter credits" are equivalent to two "semester" credits.

Most colleges reckon credits by one of the foregoing methods, but there are others. For example, a credit in a Minnesota state teachers' college means five fifty-minute classroom periods per week for a "term" of twelve weeks; in Minnesota high schools a credit represents five forty-minute classroom periods per week for a "semester" of eighteen weeks, and two credits constitute a "unit," or one year's work.

It must be understood that the classroom periods indicated above do not include the time required for preparation, which is ordinarily two hours of outside study for each classroom hour.

STATE TEACHERS' CERTIFICATES

The Department of Public Instruction issues elementary school certificates upon examination or upon the presentation of a diploma earned in a two-year course at a state teachers' college. Correspondence credits are not directly applicable for these certificates but usually may be applied toward a diploma, if arrangements have been made in advance with the teachers' college.

Professional certificates, entitling the holder to teach in high schools, are issued upon examination or upon the presentation of an academic degree from an accredited college, together with credentials showing fifteen semester credits or twenty-two and a half quarter credits in certain designated educational subjects, earned in a recognized institution. Educational credits received from this department will be accepted directly toward such a certificate when presented by the holder of an academic degree.

In either case correspondence courses may be used as an efficient means of preparing for the state examinations.

RESIDENT STUDENTS

Registration for correspondence courses will not be accepted from resident students of the University of Minnesota or of any other institution of learning unless acceptance would be justified by exceptional circumstances.

Persons pursuing correspondence courses for credit must discontinue them when they enter school. Arrangements may be made to hold the courses over until the student is again free to pursue them.

No university student may enroll for a correspondence course for the purpose of removing a condition or a failure, except by consent of the Students' Work Committee.

EXAMINATIONS

All students on completing any course will be given an examination either at the University or, by arrangement, in their home towns under the supervision of an accredited representative of the University. This representative may often be the local superintendent of schools.

GRADE SYMBOLS

The following grade symbols are used to indicate the grade of any paper :

A (93-100)	D (75-81)
B (87-93)	E (Conditioned*)
C (81-87)	F (Failed)

OTHER EXTENSION ACTIVITIES

The Extension Service of the University of Minnesota is organized to include:

- A. Evening classes, in Minneapolis, St. Paul, Duluth, and other cities.
 1. Courses leading to credit in the College of Science, Literature, and the Arts, in the College of Education, in the School of Business, and in the School of Mines.
 2. Courses in business administration, accounting, and finance.
 3. Practical courses in engineering and in industrial subjects.
- B. Correspondence courses.

C. Extension lectures, singly or in groups, and lyceum lectures, concerts, and entertainments.

D. The Municipal Reference Bureau, which compiles and furnishes to city officials information pertaining to municipal government and administration.

E. The Branch of Visual Instruction, through which loan collections of lantern slides and films are furnished to schools and clubs.

F. Drama Service, through which dramatic clubs and school societies are given advice about the production of amateur theatricals and copies of plays are lent for reading and selection.

G. Agricultural Extension, including lectures, demonstrations, institutes, and short courses under the direction of the College of Agriculture, Forestry, and Home Economics.

* Grade E will become grade F unless condition is removed by re-examination within three months.

LIST OF COLLEGIATE COURSES†

Anthropology				
51	Introduction	27 lessons	5 credits	\$17.00
Art Education				
3	Interior Decorating	16 lessons	3 credits	\$10.00
Astronomy				
1	Descriptive Astronomy	24 lessons	4½ credits	\$15.00
2	Uranography	12 lessons	2½ credits	7.50
Business				
1	Business Correspondence	24 lessons	4½ credits	\$15.00
2	Business Law A.....	16 lessons	3 credits	10.00
3	Business Law B.....	16 lessons	3 credits	10.00
4	Business Law C.....	16 lessons	3 credits	10.00
5	Business Law D.....	16 lessons	3 credits	10.00
6	Principles of Accounting I..	22 lessons	4 credits	14.00
	Principles of Accounting II..	22 lessons	4 credits	14.00
Economics				
1	Principles I	27 lessons	5 credits	\$17.00
2	Principles II	27 lessons	5 credits	17.00
3	Banking Practice	24 lessons	4½ credits	15.00
6	Labor Problems	16 lessons	3 credits	10.00
7	Public Finance	24 lessons	4½ credits	15.00
8	Commercial Policies	16 lessons	3 credits	10.00
9	Economic History I	24 lessons	4½ credits	15.00
10	Economic History II	24 lessons	4½ credits	15.00
11	Money and Banking I.....	16 lessons	3 credits	10.00
12	Money and Banking II.....	16 lessons	3 credits	10.00
13	Corporation Finance	16 lessons	3 credits	10.00
Education				
2	Educational Psychology	16 lessons	3 credits	\$10.00
3	Early History of Education	24 lessons	4½ credits	15.00
4	History of Modern Educ....	24 lessons	4½ credits	15.00
7	Industrial Education	24 lessons	4½ credits	15.00
8	Theory of Teaching	24 lessons	4½ credits	15.00
9	School Organization and Law	27 lessons	5 credits	17.00
10	School Sanitation	27 lessons	5 credits	17.00
12	Social Aspects of Education..	27 lessons	5 credits	17.00
13	Industrial History	11 lessons	2 credits	7.00
25	Teaching Related Subjects...	16 lessons	3 credits	10.00

† Credits indicated are "quarter" credits as explained on Page 10 and are applicable toward a university degree, except those marked ‡ which are extension credits only.

LIST OF COURSES

13

Engineering

6 Statics and Kinematics.....	27 lessons	5½ credits	\$17.00
7 Dynamics	27 lessons	5½ credits	17.00
9 Strength of Materials.....	27 lessons	5½ credits	17.00
10 Hydraulics	22 lessons	4½ credits	14.00
19 Descriptive Geometry	27 lessons	5½ credits	17.00

English

Literature

1 English Survey I	16 lessons	3 credits	\$10.00
2 English Survey II	16 lessons	3 credits	10.00
3 English Survey III	16 lessons	3 credits	10.00
4 American Literature	16 lessons	3 credits	10.00
6 The English Novel.....	24 lessons	4½ credits	15.00

Rhetoric

1 Rhetoric I	16 lessons	3 credits	\$10.00
2 Rhetoric II	16 lessons	3 credits	10.00
3 Rhetoric III	16 lessons	3 credits	10.00
4 Exposition	16 lessons	3 credits	10.00
7 Description	16 lessons	3 credits	10.00
8 Narration	16 lessons	3 credits	10.00
9 Versification I	16 lessons	3 credits	10.00
10 Versification II	16 lessons	3 credits	10.00

German

*1 Beginning German I	27 lessons	5 credits	\$17.00
*2 Beginning German II	27 lessons	5 credits	17.00
*3 Beginning German III	27 lessons	5 credits	17.00
4 Rapid Reading I	27 lessons	5 credits	17.00
28 Chemical German I.....	16 lessons	3 credits	10.00
29 Chemical German II.....	16 lessons	3 credits	10.00
31 Medical German I.....	16 lessons	3 credits	10.00
32 Medical German II.....	16 lessons	3 credits	10.00
50 Elementary Composition I..	16 lessons	3 credits	10.00
52 Elementary Composition II..	16 lessons	3 credits	10.00
63 Drama I	24 lessons	4½ credits	15.00
64 Drama II	24 lessons	4½ credits	15.00

Greek

*1 Beginning Greek I	27 lessons	5 credits	\$17.00
*2 Beginning Greek II	27 lessons	5 credits	17.00
*3 Beginning Greek III	27 lessons	5 credits	17.00
4 Anabasis	27 lessons	5 credits	17.00
5 Herodotus	27 lessons	5 credits	17.00
6 Homer	27 lessons	5 credits	17.00
51 Philosophy	16 lessons	3 credits	10.00
52 Oratory	16 lessons	3 credits	10.00
53 Drama	16 lessons	3 credits	10.00

* May be taken for one entrance credit.

History

1	Ancient I (Greece)	24 lessons	4½ credits	\$15.00
2	Ancient II (Rome)	24 lessons	4½ credits	15.00
7	Middle Ages	24 lessons	4½ credits	15.00
10	Modern World I	27 lessons	5 credits	17.00
11	Modern World II	27 lessons	5 credits	17.00
15	English I	24 lessons	4½ credits	15.00
16	English II	24 lessons	4½ credits	15.00
20	United States I	24 lessons	4½ credits	15.00
21	United States II	24 lessons	4½ credits	15.00

Journalism

1	Reporting I	16 lessons	3 credits	\$10.00
2	Reporting II	16 lessons	3 credits	10.00
3	Reporting III	16 lessons	3 credits	10.00
4	Editing I	16 lessons	3 credits	10.00
5	Editing II	16 lessons	3 credits	10.00
6	Editing III	16 lessons	3 credits	10.00
20	Editorial-Writing I	16 lessons	3 credits	10.00
21	Editorial-Writing II	16 lessons	3 credits	10.00

Latin

*1	Beginning Latin I	27 lessons	5 credits	\$17.00
*2	Beginning Latin II	27 lessons	5 credits	17.00
*3	Caesar I	20 lessons	4 credits	13.50
*4	Caesar II	20 lessons	4 credits	13.50
*5	Cicero I	27 lessons	5 credits	17.00
*6	Cicero II	27 lessons	5 credits	17.00
*7	Aeneid I	24 lessons	4½ credits	15.00
*8	Aeneid II	27 lessons	5 credits	17.00
9	Livy	24 lessons	4½ credits	15.00
10	Plautus and Terence	24 lessons	4½ credits	15.00

Mathematics

*6	Higher Algebra I	27 lessons	5 credits	\$17.00
*7	Higher Algebra II	27 lessons	5 credits	17.00
*8	Trigonometry	27 lessons	5 credits	17.00
9	Plane Analytical Geometry	27 lessons	5 credits	17.00
10	Differential Calculus	27 lessons	5 credits	17.00
11	Integral Calculus	27 lessons	5 credits	17.00
12	Differential Equations	27 lessons	5 credits	17.00

Music

1	Harmony	24 lessons	4½ credits	\$15.00
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Physics

1	Mechanics and Sound	16 lessons	3 credits	\$10.00
2	Heat	16 lessons	3 credits	10.00
3	Optics	16 lessons	3 credits	10.00
4	Magnetism and Electricity	16 lessons	3 credits	10.00

* May be taken for one entrance credit.

LIST OF COURSES

Political Science

1 American Government	27 lessons	5	credits	\$17.00
3 State and Local Government.	27 lessons	5	credits	17.00
4 International Law	24 lessons	4½	credits	15.00
5 Political Parties	27 lessons	5	credits	17.00

Psychology

1 General Psychology I	16 lessons	3	credits	\$10.00
2 General Psychology II.	16 lessons	3	credits	10.00
3 Applied Psychology	16 lessons	3	credits	10.00

Romance Languages

French

*1 Beginning French I	27 lessons	5	credits	\$17.00
*2 Beginning French II	27 lessons	5	credits	17.00
*3 Intermediate French I.	27 lessons	5	credits	17.00
*4 Intermediate French II.	27 lessons	5	credits	17.00
8 Scientific French I	16 lessons	3	credits	10.00
9 Scientific French II	16 lessons	3	credits	10.00
10 Scientific French III	16 lessons	3	credits	10.00
53 Elementary Composition	16 lessons	3	credits	10.00
59 Advanced Composition	16 lessons	3	credits	10.00

Spanish

*1 Beginning Spanish I	27 lessons	5	credits	\$17.00
*2 Beginning Spanish II	27 lessons	5	credits	17.00
*3 Intermediate Spanish I	27 lessons	5	credits	17.00
*4 Intermediate Spanish II	27 lessons	5	credits	17.00
53 Elementary Composition	16 lessons	3	credits	10.00
59 Advanced Composition	16 lessons	3	credits	10.00

Scandinavian

Norwegian

*1 Beginning Norwegian I	20 lessons	4	credits	\$13.50
*2 Beginning Norwegian II	20 lessons	4	credits	13.50
*3 Intermediate Norwegian I.	20 lessons	4	credits	13.50
*4 Intermediate Norwegian II.	20 lessons	4	credits	13.50
5 Advanced Norwegian I	24 lessons	4½	credits	15.00
6 Advanced Norwegian II	24 lessons	4½	credits	15.00

Swedish

*1 Beginning Swedish I	20 lessons	4	credits	\$13.50
*2 Beginning Swedish II	20 lessons	4	credits	13.50
*3 Intermediate Swedish I	20 lessons	4	credits	13.50
*4 Intermediate Swedish II	20 lessons	4	credits	13.50
107 Literature I	16 lessons	3	credits	10.00
108 Literature II	16 lessons	3	credits	10.00
109 Literature III	16 lessons	3	credits	10.00

* May be taken for one entrance credit.

Sociology

1	Introduction	27 lessons	5 credits	\$17.00
2	Rural Sociology	27 lessons	5 credits	17.00
10	Rural Com. Organization	16 lessons	3 credits	10.00
11	Social Organization	16 lessons	3 credits	10.00
14	Social Progress	16 lessons	3 credits	10.00
52	Rural Field Work	(See description)		5.00
119	The Family	16 lessons	3 credits	10.00

LIST OF VOCATIONAL COURSES†

Business

*7	Elementary Bookkeeping	12 lessons		\$ 7.50
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Engineering

1	Shop Mathematics I	24 lessons		\$15.00
2	Shop Mathematics II	24 lessons		15.00
*3	Mechanical Drawing I	20 lessons		12.50
*4	Mechanical Drawing II	20 lessons		12.50
5	Elementary Mechanics	16 lessons		10.00
8	Strength of Materials	16 lessons		10.00
11	Electricity and Magnetism I	24 lessons		15.00
12	Electricity and Magnetism II	24 lessons		15.00
13	Alternating Currents	20 lessons		12.50
14	Heating and Ventilating	24 lessons		15.00
16	Boiler Room Practice	16 lessons		10.00
17	Engine Room Practice	24 lessons		15.00
18	Machine Design	24 lessons		15.00
20	Lumber and Its Use	10 lessons		8.00
24	Radio Communication	16 lessons		10.00

Hygiene

‡1	Maternity and Infancy	15 lessons		no fee
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LIST OF PREPARATORY COURSES¶

Group A: English

English Literature A	20 lessons	1 credit	\$12.50
English Literature B	20 lessons	1 credit	12.50
English Literature C	20 lessons	1 credit	12.50
English Literature D	20 lessons	1 credit	12.50
English Composition A	20 lessons	1 credit	12.50
English Composition B	20 lessons	1 credit	12.50
English Composition C	20 lessons	1 credit	12.50
English Composition D	20 lessons	1 credit	12.50

† Vocational courses carry no college credit and may be undertaken by those who lack the prerequisites for entrance to the University.

* May be taken for entrance credit, see list of preparatory courses.

‡ Offered only to residents of Minnesota.

¶ Two preparatory credits equal one preparatory unit.

Group B: Languages

See list of collegiate courses.

Group C: History and Social Science

American History A	20 lessons	1 credit	\$12.50
American History B	20 lessons	1 credit	12.50
Social Science A	20 lessons	1 credit	12.50

Group D: Mathematics

Algebra A	20 lessons	1 credit	\$12.50
Algebra B	20 lessons	1 credit	12.50
Plane Geometry A	20 lessons	1 credit	12.50
Plane Geometry B	20 lessons	1 credit	12.50
Solid Geometry	24 lessons	1 credit	15.00
Higher Algebra I	27 lessons	1 credit	17.00
Higher Algebra II	27 lessons	1 credit	17.00
Trigonometry	27 lessons	1 credit	17.00

Group E: Natural Science

Elementary Physics A	16 lessons	no credit	\$10.00
Elementary Physics B	16 lessons	no credit	10.00

The courses under Group E carry no general entrance credits, but do satisfy the entrance requirement of the College of Dentistry, and will prepare a student to pass the state teachers' examination in physics for a first grade certificate.

Group F: Vocational and Miscellaneous

Mechanical Drawing I	20 lessons	1 credit	\$12.50
Mechanical Drawing II	20 lessons	1 credit	12.50
Elementary Bookkeeping	12 lessons	½ credit	7.50

This special course in bookkeeping is primarily intended to fit students to take up a college course in accountancy, but it may be applied as one quarter entrance credit.

DESCRIPTION OF COURSES

ANTHROPOLOGY

51. Introduction to Anthropology. Origin and development of mankind and the races; racial distribution and immigration; the bearing of anthropology on present-day thought and problems.

Twenty-seven lessons (five credits). Mr. Wallis.

ART EDUCATION

3. Interior Decorating. The course aims to meet the needs of home makers and teachers; to show how to make the home comfortable, and artistic. Instruction will consist of written lectures and textbook study. Blue prints and samples of fabrics will be sent with course. Students will draw series of simple plates to illustrate principles. Subjects discussed include: color, walls, floors and their coverings, period and modern furniture, fireplaces, pictures, and accessories. This course is equivalent to Art Education 3, College of Education.

Sixteen lessons (three credits). Mrs. Hanley.

ASTRONOMY

1. Descriptive Astronomy. A descriptive course designed to give accurate general information regarding the solar system and the stellar universe. It emphasizes the basic facts of the physical universe which all intelligent people should know, rather than the technical details of the work of a professional astronomer. Altho not necessary the student will find that a small telescope or even an opera glass, will add greatly to the interest in the subject.

Twenty-four lessons (four and one-half credits). Mr. Beal.

2. Uranography. A study of the constellations visible from the United States. The course includes an exposition of star magnitudes; use of star maps; identifications of the constellations, brighter stars, variables, doubles, clusters, and nebulae; interpretation of the Milky Way; reading of star folklore; watching the motions of the brighter planets relative to the sun and stars. The course can be begun at any time.

Twelve lessons (extension credit only). Mr. Beal.

BUSINESS COURSES

1. Business Correspondence. Mastery of materials, letters in general, letters adjusting complaints, reminder letters, recommendation letters, application letters, credit and collection letters, general sales letters, form letters, follow-up letters. The ability to use correct English is prerequisite.

Twenty-four lessons (extension credit only). Mr. Conley.

2. Business Law A—Contracts and Agency. Contracts: Formation of contracts, offer and acceptance, consideration, capacity of parties, minors, married women, misrepresentation, fraud, legality of object, the operation of contracts, interpretation of contracts, methods of discharging contracts. Agency: Methods of forming the relation of agency, who may act as agent, who may act as principal, liabilities of principal to third parties, liabilities of agents, termination of agency.

The general rules of contracts being fundamental to all work in business law, this course must precede Business Law B, C, and D.

Sixteen lessons (three credits). Mr. Smiley.

3. Business Law B—Personal Property, Sales, Bailments, Negotiable Instruments. Negotiable instruments, nature and characteristics, definition; the uniform negotiable instruments law, essentials, non-essentials, negotiations, indorsements and delivery, holder in due course and his rights, notice of dishonor, protest, checks. Personal property—bailments: definitions, distinction between real and personal property, nature of bailment, rights of bailor, rights of bailee. Sales of personal property: definition of a sale; when the title passes to the buyer; rights of the seller (a) to set the contract aside on the ground of fraud, (b) the seller's lien for the purchase money, (c) right of stoppage in transit; rights of the purchaser to demand (1) goods of a certain quality, (2) warranty of the purchaser's title. Prerequisite: Course 2.

Sixteen lessons (three credits). Mr. Smiley.

4. Business Law C—Partnerships, Corporations, and Bankruptcy. Partnerships: formation of partnerships; articles of co-partnership; methods of terminating partnerships; rights and obligations of partner (a) toward his co-partners, (b) as an agent of the firm, (c) toward the firm's creditors, (d) for an accounting; special partners: limited partnerships.

Joint stock companies; how distinguished from ordinary partnerships; how like ordinary partnerships; statutory requirements.

Corporations: formation of corporations of various classes; terminations of corporations; membership in corporations, methods of transferring interest, fraudulent issuance of stock by corporate officers; rights of stockholders (a) to dividends, (b) to inspect and control corporate affairs; liabilities of stockholders (a) on stock subscriptions, (b) to pay assessments, (c) for the corporate debts; the doctrine of ultra vires; rights and obligations of corporate directors; corporate-mergers and consolidations; domestic and foreign corporations; solvency and the national bankruptcy act. Prerequisite: Course 2.

Sixteen lessons (three credits). Mr. Smiley.

5. Business Law D—Real Property, Mortgages. Classification of property, distinction between real and personal property; estates in land, freehold, life estate, tenancy for a term, at will, at sufferance; estate held jointly or in common, equitable estates, relative rights of adjoining owners, trespass, easements, sales of real property, the contract to sell, conveyances, wills, mortgages, and liens, landlord and tenant, the lease,

assignment and subletting, rent, and remedies for non-payment. Pre-requisite: Course 2.

Sixteen lessons (three credits). Mr. Smiley.

6. Principles of Accounting. This is a course containing all the fundamental principles of accounting, together with sufficient practice work to show the application of these principles. The emphasis throughout is put upon principle rather than upon the details of method; but the practice material is made to conform to present-day methods as nearly as possible, and the course demonstrates what service accounting should render to business.

Part I treats of the fundamentals of debit and credit, the books of account, standard methods of recording transactions, accruals and adjustments, construction and interpretation of balance sheets and income statements, classification of accounts, the distinction between capital and revenue, and an introduction to partnerships.

Twenty-two lessons (four credits). Mrs. Youngs.

Part II is built up with corporation accounting as its leading feature, but gives further consideration to partnerships, and to certain essential accounting principles, such as valuation, depreciation, capital, and revenue. These general principles will be emphasized and made clear by application to various businesses by means of problems, in which manufacturing establishments will be included.

Twenty-two lessons (four credits). Mrs. Youngs.

7. Elementary Bookkeeping. The aim of this course is to present the groundwork of bookkeeping for the student who does not feel able to complete an extensive course in accounting. The following topics will be covered: the function of accounting, theory of debit and credit, journalizing and posting, account analysis, the use of special types of journals and ledgers, trial balance adjusting and closing the accounts, presentation of the period's results, balance sheet, and profit and loss statements. Sufficient practice material will be given to enable the student to grasp the fundamentals.

Twelve lessons (one-half entrance credit). Mr. Kuhlman.

ECONOMICS

1. Principles of Economics, Part I. This course, with Part II, is designed to give a general understanding of our present industrial order. Special attention is given to descriptive accounts of economic institutions and to a consideration of basic principles underlying their operation.

Part I of the course presents certain fundamental concepts followed by a study of division of labor, of large scale production, and of the corporation as a type of enterprise. The principles governing value follow. This part closes with a discussion of money, banking, prices, crises, and international trade.

Twenty-seven lessons (five credits). Mr. Farmer.

2. Principles of Economics, Part II. A continuation of the study of value to discover what measures the reward received by the respective factors of production in wages, interest, rent, and profits. Then follows special problems of labor and labor unions, railways, public utilities, and finally the principles underlying taxation.

Twenty-seven lessons (five credits). Mr. Farmer.

3. Banking Practice. The subject-matter of this course aims to present a thorough understanding of the operations of a modern commercial bank and includes many managerial problems. Some attention will be given to the legal problems arising in dealings between banks and their customers. Beginning with a description of commercial banking, of savings banks, and trust companies, the course will be developed under the following topics: how to organize a commercial bank; shareholders, directors and officers, their duties, powers, and liabilities; deposits, depositors, and the receiving teller; the paying teller and checks; the bank reserve; national bank notes; clearing houses; collections and domestic exchange; foreign exchange; loans and discounts, credit departments and how they judge credit; collateral loans; statements of conditions; the object of bank accounting; supervision and examination; central banks of England, France, and Germany, and the federal reserve system of the United States. Prerequisite for credit: Course 1.

Twenty-four lessons (four and one-half credits). Mr. Ebersole.

6. Labor Problems and Trade Unionism. Origin of the labor problem; conditions of labor in American industries; structure, aims, policies, and methods of trade and industrial unionism and employers' associations; collective bargaining and shop committees; mediation and arbitration; injunctions; labor legislation.

Sixteen lessons (three credits). Mr. Hansen.

7. Public Finance. Government revenues, expenditures, and debts. This includes a study of the various forms of taxation, of budgetary legislation and control, of war and emergency financing, of the shifting and incidence of taxation, and of fiscal reforms. Prerequisite for credit: Courses 1 and 2.

Twenty-four lessons (four and one-half credits). Mr. Blakey.

8. Commercial Policies. Theory of international commerce, free trade, reciprocity, protection, and other governmental and organized efforts to affect trade, with special emphasis upon American policies in view of post-war conditions. Prerequisites for credit: Courses 1 and 2. Several texts must be read in addition to those on which the course is based.

Sixteen lessons (three credits). Mr. Blakey.

9. Economic History I. This is a general course in economic history and includes a survey of the development of agriculture, manufacture, transportation, and storage, and the exchange of goods; economic crises; land, capital, management, and labor; the interplay of economic and political forces.

Twenty-four lessons (four and one-half credits). Mr. Taylor.

10. Economic History II. This is a continuation of Course 9, which is a prerequisite to it. The two parts are required of all pre-business students and form an introduction to the principles of economics. The work especially meets the needs of those students who desire to qualify as full business students, but who failed to take this subject when they did their first two years of work. It is also of great value to those who wish to gain a clear understanding of present-day economic conditions.
Twenty-four lessons (four and one-half credits). Mr. Taylor.
11. Principles of Money and Banking I.* This course deals with the government regulations of money, with the mechanism of the money market, the sale of securities and with the functions of trust companies, savings institutions, and commercial banks. Prerequisite: Courses 1 and 2.
Sixteen lessons (three credits). Mr. Myers.
12. Principles of Money and Banking II.* This is a continuation of Course 11 and deals with the inter-relation of banks, government regulation of banking, the relation of business cycles to banking, the federal reserve system, farm finance, the American financial system as a whole, and the outstanding features of certain foreign financial systems. Prerequisites: Courses 1, 2, and 11.
Sixteen lessons (three credits). Mr. Myers.
13. Corporation Finance. A study of the organization and financial management of corporations, with reference to corporate securities for purposes of promotion and reorganization and of facilities for marketing them.
Sixteen lessons (three credits). Mr. Stehman.

EDUCATION

NOTE.—See Courses 1 and 2 under Psychology.

2. Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. This survey includes the following topics: psychological and educational measurements, habit formation, transfer of training, statistical methods. Courses 1 and 2 in psychology are prerequisite.
Sixteen lessons (three credits).
3. History of Education to the Reformation. An historical study of the foundation of modern education. The theories and practices of the Hebrews, Greeks, and Romans, and of the Middle Ages and the Renaissance, are considered in the light of their influence upon the present educational situation. The course includes the work offered in residence Course 101. Prerequisite: six credits in psychology. In special cases these prerequisites may be waived.
Twenty-four lessons (four and one-half credits). Miss Alexander.
4. History of Modern Education. Educational history since the time of the Renaissance. A study of the theory of the great modern educators: the origin, aims, and development of typical secondary and higher schools in various countries; the rise of the modern elementary school with em-

* Courses 11 and 12 carry general credit in economics, but are not applicable in a major sequence in economics or finance.

phasis upon early state systems and reform movements. Equivalent in part to residence Courses 102 and 103. Prerequisite: six credits in psychology.

Twenty-four lessons (four and one-half credits). Miss Alexander.

7. **Industrial Education.** The principles fundamental to vocational training in the public school system as affecting the arrangement of school years, the course of study, and the methods of teaching. Prerequisite for credit: Courses 3 and 4.

Twenty-four lessons (four and one-half credits). Mr. Rankin.

8. **Theory of Teaching.** An introductory course in educational theory for elementary school teachers. The work includes a study of the principles upon which the present practice of teaching is based, and of the responsibility of the school in providing various forms of training. Other topics are considered briefly, such as types of classroom, exercises, the making of lesson plans, qualifications of teachers, school management. Prerequisite: six credits in psychology. In special cases a student may, by conference with the instructor, waive these prerequisites.

Twenty-four lessons (four and one-half credits). Miss Alexander.

9. **School Organization and Law.** An introductory course in the organization and management of schools in American communities, with special reference to the duties of school boards and school superintendents, principals, and teachers, to the methods and equipment proper to schools of various grades, and to the main facts in the school law of Minnesota. Prerequisite for credit: Courses 3 and 4.

Twenty-seven lessons (five credits). Mr. Rankin.

10. **School Sanitation.** This course is designed for those who are concerned with schools of any and all grades. It deals with conditions affecting the health of school children of all ages. School architecture, courses of study, and the discipline of the school will be considered as well as all other questions affecting the well-being of pupils. Prerequisite for credit: Courses 3 and 4.

Twenty-seven lessons (five credits). Mr. Rankin.

12. **Social Aspects of Education.** This course is concerned with the school as an environment which is designed to fit its pupils for their social relations; also it discusses the school in respect to its interaction with other institutions of a similar character and aim. It is a common remark that the school is becoming more and more a social institution, and this course attempts to determine in what respect and in what manner this is true. Prerequisite for credit: Psychology 1 and 2.

Twenty-seven lessons (five credits). Mr. Rankin.

13. **Industrial History.** Evolution of arts, industry, tools, processes, and production to 1800; evolution of 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.

Eleven lessons (two credits). Mr. Rankin.

25. The Teaching of Related Subjects. Theory, practices, and problems of related instruction; content in related mathematics, drawing, science, hygiene, and safety; group study and unit-course preparation; usable methods and the means of supervision; both incidental and scheduled teaching discussed; acquaintance with texts and supplementary materials; courses designed particularly for shop and related subjects teachers in day, evening, and part-time vocational classes and for those preparing for service in this special field; suggestive for teachers in the more standardized units of the public school system.

Sixteen lessons (three credits). Mr. Smith.

ENGINEERING

1. Shop Mathematics, Part I. This course is for the practical man who desires training in mathematics to solve mechanical and electrical problems and will be found valuable by the teacher who is preparing to teach applied mathematics under the Smith-Hughes Act. It takes up arithmetic from fractions through proportion and contains problems in areas, volumes, weights of materials, screw threads, and gears. It teaches logarithms, the use of the slide rule, and the fundamental elements of machines, such as levers, pulleys, and the inclined plane.

Twenty-four lessons (extension credit only). Mr. Edwards.

2. Shop Mathematics, Part II. This work follows Part I and takes up algebra, geometry, and trigonometry from a practical shop standpoint. A thoro working knowledge of the formulae is given. Each lesson in both Parts I and II has numerous practical problems to be worked by the student.

Twenty-four lessons (extension credit only). Mr. Edwards.

- 3.* Mechanical Drawing, Part I. The course includes the use of instruments, lettering, views and sections, conventions, sketching, dimensioning, completed working drawings, and tracing. The course is designed to meet the needs of beginners.

Twenty lessons (extension credit only). Mr. French.

- 4.* Mechanical Drawing, Part II. A continuation of Part I.

Twenty lessons (extension credit only). Mr. French.

5. Elementary Mechanics. A short, practical course in elementary mechanics designed to meet the needs of students who have had limited training in mathematics. Numerical and simple graphical calculations, forces, simple machines, velocity, acceleration, impulse, momentum, work, power, and energy are treated. This course is designed for those who desire an elementary knowledge of the subject, but who are not familiar with calculus. Prerequisite: Courses 1 and 2 or equivalent.

Sixteen lessons (extension credit only). Mr. Teeter.

6. Technical Mechanics I—Statics and Kinematics. Characteristics of a force, parallelogram law, moments, couples, resultant of a force system, equilibrium of a force system, frictions, centroids, moment of inertia.

* May be taken for one-half entrance credit. It is impossible to quote prices on drawing outfits. The cost will probably be from \$8 to \$12.

Motion of a particle, motion of a rigid body. Prerequisite: Mathematics, Course 11.

Twenty-seven lessons (extension credit only). Mr. Teeter.

7. Technical Mechanics II—Dynamics. Force, mass, acceleration, translation and rotation, gyroscope, governors, work, energy, power, conservation of energy, impulse, momentum, loss of kinetic energy, conservation of momentum. Prerequisite: Course 6.

Twenty-seven lessons (extension credit only). Mr. Teeter.

8. Strength of Materials—Elementary. An elementary course on the strength of materials in common use. It treats of properties of materials, stress and strain, elastic limit, ultimate strength, deformation, deflection, principle of moments, moments of inertia, and the general elemental theory of beams, columns, and shafts. This course is especially designed for those students who desire an elementary knowledge of the subject, but who are not familiar with calculus. Prerequisite: Courses 1, 2, and 5.

Sixteen lessons (extension credit only). Mr. Teeter.

9. Strength of Materials—Technical. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinder, rollers, plates, curved bars, springs, dynamic stresses, true stresses. Prerequisite: Mathematics, Course 11.

Twenty-seven lessons (extension credit only). Mr. Teeter.

10. Hydraulics. Laws of equilibrium of fluids, flow through orifices and over weirs, pressure and flow through tubes and pipes, flow in conduits and rivers, dynamic pressure of water, elementary principles of turbines and pumps. Prerequisite: Mathematics, Course 11.

Twenty-two lessons (extension credit only). Mr. Teeter.

11. Electricity and Magnetism, Part I. An elementary study of magnetism and electricity. Simple laws of magnetism, and the relation of magnetism to direct current electricity are developed. Series and parallel circuits, and combinations of both, simple wiring and armature winding are taken up. A knowledge of arithmetic such as is given by Shop Mathematics I is necessary.

Twenty-four lessons (extension credit only). Mr. Edwards.

12. Electricity and Magnetism, Part II. This course is a continuation of Part I. It will deal with motors, generators, and instruments.

Twenty-four lessons (extension credit only). Mr. Edwards.

13. Alternating Currents. This course takes up simple laws of alternating currents and their application to machines; inductance, capacity, and impedance are fully treated.

Twenty lessons (extension credit only). Mr. Edwards.

14. Heating and Ventilating. The course is intended to meet the needs of those who wish to know about the principles and installation of heating and ventilating apparatus. The work will include an introduction and study of heat, heat losses, heat loss due to ventilation, ventilation practice, air conditioning, heating systems—steam and hot water, direct and indirect, use of exhaust steam, warm-air system, fan systems—plenum and exhaust systems, vacuum systems, piping systems, central station heating, and heating accessories.

Twenty-four lessons (extension credit only). Mr. Martens.

16. Boiler Room Practice. The course is intended for the boiler operator. Outline of course: combustion, coal; firing methods; flue-gas analysis; boiler construction; feed water; boiler fittings; power of boilers; care of boilers; pipes and fittings; pipe covering; steam tables.

Sixteen lessons (extension credit only). Mr. Martenis.

17. Engine Room Practice. The course is planned to give an elementary and plain presentation of the subject to operating engineers who are not able to comprehend fully the average textbook on steam engines. Outline of course: principles of energy, motion, steam; classes of steam engines; parts of the steam engine; valves and steam action; valve-setting; governing; reversing gears; indicators and cards; calculating horse-power; pumps, condensers, lubrication; engine troubles.

Twenty-four lessons (extension credit only). Mr. Martenis.

NOTE.—For those who are in boiler room practice and who may wish to take an examination for a chief engineer's license, Courses 1, 16, and 17 are of the utmost importance.

18. Elements of Machine Design. A short, practical course in machine design. Some elementary machines will be discussed and the laws of mathematics, mechanics, and strength of materials will be applied in each case, leading to the complete design of the particular machine under consideration. Working details and general drawings will be made as the work advances. Prerequisites: Courses 1, 2, 3, 4, 5, and 8.

Twenty-four lessons (extension credit only). Mr. Edwards.

19. Descriptive Geometry. An elementary course in methods of projection and developments as applied to engineering, drawing, template-making, etc. Correlated with analytic geometry. Graphical and algebraic solutions.

Twenty-seven lessons (extension credit only). Mr. Teeter.

20. Lumber and Its Uses. Structural and physical properties of wood, standard grades and sizes, structural timbers, seasoning and preservation, paints and stains, lumber prices, cost of wood construction, specific uses of woods, and selections of materials.

Ten lessons (extension credit only). Fee includes text material. Mr. Cheyney.

24. Elements of Radio Communication. A brief non-mathematical discussion of magnetism; direct and alternating currents; electromagnetic waves and their propagation; apparatus and methods used in radio communication. Attention is given to the construction and use of crystal and vacuum tube receiving sets and to radio telegraph and telephone sending sets. The rules and laws covering licenses, wave-lengths, and safety precautions are indicated. This course is especially valuable to students in elementary physics.

Sixteen lessons (extension credit only). Mr. Swenson.

ENGLISH AND RHETORIC

PREPARATORY COURSES

1. English Composition A. This course, and the three following, are suited to the needs of those persons who do not have a good foundation in English, and hence need training in the correct use of the language. It covers that part of the work in composition usually given in the freshman year at high schools. It gives practice in writing compositions on simple subjects, with special attention to the development of sentence structure and a unified paragraph; special drill to overcome errors in grammar, spelling, punctuation, etc.; training in the use of the dictionary.
Twenty lessons (one entrance credit). Mrs. Patterson.
2. English Composition B. This course is a continuation of the work of the first year, and covers the equivalent of the sophomore work in composition in high schools. Special emphasis is placed on punctuation and letter-writing. Prerequisite: Course 1 or equivalent.
Twenty lessons (one entrance credit). Mrs. Patterson.
3. English Composition C. This course is a continuation of Courses 1 and 2, but it is more advanced and presupposes the ability to do more thoughtful work, as it covers the composition work of the junior year of the high school. Composition forms a large part of the course. In it emphasis is placed on gathering material and organizing it into longer themes than those of the first year. Drill in spelling, punctuation, etc., includes more difficult points than those covered in the first year. Prerequisite: Courses 1 and 2 or equivalent.
Twenty lessons (one entrance credit). Mrs. Patterson.
4. English Composition D. This course is a continuation of Course 3, and corresponds to high school senior English composition. Prerequisite: Courses 1, 2, and 3 or their equivalent.
Twenty lessons (one entrance credit). Mrs. Patterson.
5. English Literature A. The object of this course is to arouse in the student an interest in the reading of good literature and to assist him to a knowledge and appreciation of some of the masterpieces in the various forms of literature. It includes the study of a volume of short stories, a volume of poetry, Shakespeare's *Merchant of Venice*, and Scott's *Ivanhoe*. The reading of an additional volume of each type is required of the student and questions set to assist as well as to test his understanding of the works read. The course corresponds to the literature part of high school freshman English.
Twenty lessons (one entrance credit). Miss Grandy.
6. English Literature B. The aim of this course is similar to that of English Literature A but the material studied is more difficult and the standard of work higher. It corresponds to the literature part of high school sophomore English. The works studied are Poe's *Tales*, Shakespeare's *Julius Caesar*, Dickens' *Tale of Two Cities*, Lowell's *Vision of Sir Launfal*, and Coleridge's *Rime of the Ancient Mariner*. Outside reading from literature of each type is also required. Prerequisite: Course 5 or equivalent.
Twenty lessons (one entrance credit). Miss Grandy.

7. English Literature C. This is a course in American literature. The works of well-known American authors, including those of recent date, are studied according to type rather than in chronological order. Some knowledge of the authors' lives as well as of their works is required. The course corresponds to the literature half of high school junior English. Prerequisite: Courses 5 and 6 or equivalent.
Twenty lessons (one entrance credit). Miss Grandy.
8. English Literature D. This course, which corresponds to high school senior English literature, consists of a chronological study of the outstanding writers of English literature, their chief works and the periods in which they lived. It aims to establish standards of appreciation for the student's later reading, and to stimulate him to further reading of good literature. Prerequisite: Courses 5, 6, and 7 or equivalent.
Twenty lessons (one entrance credit). Miss Grandy.

COLLEGE COURSES

English

1. Survey of English Literature I. A general survey of English literature from the earliest times to 1630, with a great deal of emphasis upon the historical setting. Extensive readings from volumes of examples of the most famous poetry and prose. When feasible, the special study of the work of one of the major authors is recommended to be done at the same time, as an intensive offset to so much rather sporadic reading. Prerequisites for credit: Rhetoric 1, 2, and 3 or equivalent.
Sixteen lessons (three credits). Miss Grandy.
2. Survey of English Literature II. A general survey of English literature from 1630 to 1780. Prerequisite for credit: Course 1 or equivalent.
Sixteen lessons (three credits). Miss Grandy.
3. Survey of English Literature III. A general survey of English literature from 1780 to 1900. Prerequisite for credit: Courses 1 and 2 or equivalent.
Sixteen lessons (three credits). Miss Grandy.
4. American Literature—General Survey. A study of American literary development, with particular attention to the influence of English literature and the effect of our own national history upon the progress of thought and expression in the United States. The student must read extensively from American authors and answer questions which will call for constructive criticism and independent estimates. Textbook comments will not be accepted. Prerequisite for credit: Courses 1, 2, and 3 or equivalent.
Sixteen lessons (three credits). Mr. Sutcliffe.
6. The English Novel. An elementary course in the principles of fiction with the careful study of seven novels, selected to represent various aspects of the history of English prose fiction; also the study of a contemporaneous novel with an attempt to ascertain its literary value and its relationship to the masterpieces of the past. The consecutive study of the novels will be accompanied by selected assignments from

George Saintsbury, *The English Novel*. Prerequisite for credit: Courses 1, 2, and 3 or equivalent.

Twenty-four lessons (four and one-half credits). Mr. Sutcliffe.

Rhetoric

1. Rhetoric I. Practical training in the art of writing, the principles of structure, and analysis of specimens of good prose. Constant practice in writing papers, mainly expository in character. This course, with the two following, is equivalent to Rhetoric 4-5-6 in the College of Science, Literature, and the Arts. Rhetoric 1, 2, and 3 and Survey of English Literature 1, 2, and 3 fulfill the freshman English requirement. Sixteen lessons (three credits). Mrs. Selvage.
2. Rhetoric II. Continuation of Course 1. Advanced work in composition, with practice in writing exposition, narration, and description. Sixteen lessons (three credits). Mrs. Selvage.
3. Rhetoric III. Continuation of Course 2. Advanced work in analysis, with practice in writing exposition and informal argument. Sixteen lessons (three credits). Mrs. Selvage.
4. Exposition. Imitative and creative work in the various types of exposition, with especial recognition of the way in which exposition merges into narration and description. This course, with the two following, is equivalent to Rhetoric 11, 12, and 13 in the College of Science, Literature, and the Arts. Prerequisite for credit: Courses 1, 2, and 3. Sixteen lessons (three credits). Mrs. Selvage.
7. Description. Non-technical but thorough study and application of the principles of descriptive writing. Analysis of specimens and exercises in description. Prerequisite for credit: Courses 1, 2, and 3. Sixteen lessons (three credits). Mrs. Selvage.
8. Narration. Study of the principles of narrative-writing; point of view, plot, setting, characterization. Exercises, and practice in writing short narratives. Prerequisite for credit: Courses 1, 2, and 3. Sixteen lessons (three credits). Mrs. Selvage.
9. Versification I. Study of the nature of poetry, and a detailed analysis of English meters and the various English verse forms. Theory accompanied by criticism of poetry and practice in writing verse. Prerequisite for credit: Courses 1, 2, 3, 4, 7, and 8. Sixteen lessons (three credits). Mr. Nichols.
10. Versification II. A continuation of Course 9. Prerequisite for credit: Courses 1, 2, 3, 4, 7, 8, and 9. Sixteen lessons (three credits). Mr. Nichols.

GERMAN

1. Beginning German I. Grammar and easy composition. The course aims to give the student a knowledge of the elements of German grammar, the facility to read easy German, and to write simple German sentences. Twenty-seven lessons (five credits). Mr. Burkhard.

CORRESPONDENCE COURSES

2. Beginning German II. A continuation of Course 1.
Twenty-seven lessons (five credits). Mr. Burkhard.
3. Beginning German III. Grammar and composition continued; selected readings in easy prose and verse. Prerequisite: Courses 1 and 2 or equivalent.
Twenty-seven lessons (five credits). Mr. Burkhard.
4. Rapid Reading I. Selections from modern narrative and descriptive prose. Assigned outside readings and reports. Prerequisite: Courses 1, 2, and 3 or equivalent.
Twenty-seven lessons (five credits). Mr. Kroesch.
50. Elementary Composition I. Translation of short English selections. Paraphrasing of simple poems. Free narration. Exercises based on topical grammar review. Open to those who are taking or have taken Course 4 or equivalent.
Sixteen lessons (three credits). Mr. Lussky.
52. Elementary Composition II. Translation and grammar review continued. Both 50 and 52 must be completed before credit is given for 52.
Sixteen lessons (three credits). Mr. Lussky.
63. Drama I. Study of the present-day drama in Germany. Selected plays of Hebbel, Hauptmann, or Sudermann, with assigned readings and reports. Open to those who have completed Courses 1, 2, 3, and 4.
Twenty-four lessons (four and one-half credits). Mr. Davies.
64. Drama II. Study of the German drama of the eighteenth century and through the classic period. Selected plays of Lessing, Goethe, or Schiller, with assigned readings. Prerequisites as in Course 63.
Twenty-four lessons (four and one-half credits). Mr. Davies.
- 28-29. Chemical German. The reading of works on chemistry. Vocabulary exercises. Both parts must be completed before credit is given. Prerequisite: Course 4 or equivalent.
Part I, sixteen lessons (three credits).
Part II, sixteen lessons (three credits). Mr. Lussky.
31. Medical German I. Readings from general works on biology, anatomy, physiology, and hygiene. This course is intended primarily for medical students. It aims to give the student a scientific vocabulary and to acquaint him with the style of scientific articles. Prerequisite: Course 4. No credit given until Course 32 is completed.
Sixteen lessons (three credits). Mr. Burkhard.
32. Medical German II. A continuation of Course 31. No credit is given for 31 until 32 is completed.
Sixteen lessons (three credits). Mr. Burkhard.

GREEK

1. Beginning Greek I. The declensions and conjugations and the simpler rules of syntax, together with translation of sentences from Greek into idiomatic English and from English into Greek. Courses 1, 2, and 3 must be completed before credit is given for Course 1.
Twenty-seven lessons (five credits). Mr. Savage.

2. Beginning Greek II. Course continued; general principles, inflections, word formations, syntax, elementary readings, composition. Prerequisite: Course 1.
Twenty-seven lessons (five credits). Mr. Savage.
3. Beginning Greek III. Course continued. Prerequisite: Courses 1 and 2.
Twenty-seven lessons (five credits). Mr. Savage.
4. History—Xenophon's *Anabasis*. Selections from Books 2, 3, 4; Hadley's *Greek Grammar*; etymology reviewed and syntax studied sufficiently to enable the student to proceed confidently in the translation of the text; the irregular verb. Prerequisite for credit: Courses 1, 2, and 3 or equivalent.
Twenty-seven lessons (five credits). Mr. Savage.
5. History—Herodotus. Selected readings from Herodotus's history; syntax, dialectical forms, the irregular verb; collateral work.
Twenty-seven lessons (five credits). Mr. Savage.
6. Epic Poetry—Elementary Course in Homer. Selections from the *Iliad* or the *Odyssey*; mythology, scansion, dialectical forms. Open to those who have read in Greek prose three books of the *Anabasis*, or the equivalent.
Twenty-seven lessons (five credits). Mr. Savage.
51. Philosophy. Plato's *Apology* and selections from other works of Plato or from Xenophon's *Memorabilia*; study of Greek philosophy. Open to those who have had at least two years of Greek. Prerequisite for credit: Courses 4 to 6 or equivalent.
Sixteen lessons (three credits). Mr. Savage.
52. Oratory. Selected readings from Lysias and Demosthenes; study of the principles of Greek rhetoric and Greek oratory.
Sixteen lessons (three credits). Mr. Savage.
53. Dramatic Poetry—Elementary Course in the Drama. Euripides' *Alcetes* or *Medea*; translation, study of mythology and of Greek life. Open to those who have read at least two books of Homer in addition to three books of the *Anabasis*, or the equivalent.
Sixteen lessons (three credits). Mr. Savage.

HISTORY

PREPARATORY COURSES

1. American History. This is a course in United States history similar to that taken by third- and fourth-year students in the high school. Since it presupposes a course in the same subject in the grades, the approach is made in a somewhat different manner from that in an elementary course. More emphasis is placed on the relative importance of periods and events, on the causes and relations of events, and upon securing a broader view of our country's history. The supplementary reading is assigned with the notion that it may suggest as well as inform. The following subjects are treated with especial fulness: discovery and exploration, typical colonies and colonial life, passage of

control to England, the Revolution, its causes and results, the establishment of the new government, the rise of democracy and of nationalism, slavery and expansion, the Civil War, reconstruction, the era of big business. The course gives one entrance unit in history.

Part A, twenty lessons (one entrance credit).

Part B, twenty lessons (one entrance credit). Mr. Tohill.

COLLEGE COURSES

1. Ancient History, Part I—Greek. This course includes a brief preliminary survey of Egypt, Babylonia, and the Aegean region, showing their influence on later civilization, followed by a study of Greek history, with special stress on the development of Sparta and Athens, the Persian Wars, the Age of Pericles, the inter-relation of politics with the artistic and literary development, and finally the conquests of Alexander and the diffusion of Greek civilization over the East.
Twenty-four lessons (four and one-half credits). Mr. Perry.
2. Ancient History, Part II—Roman. A course in Roman history, including the rise of Rome from a petty city to the position of mistress of the ancient world, the great struggle with Carthage, the causes that led to the fall of the Republic, the transition to the Empire, and its history to the death of Constantine.
Twenty-four lessons (four and one-half credits). Mr. Perry.
7. The Middle Ages (800-1500). A study of western European history from the time of Charlemagne to the end of the fifteenth century.
Twenty-four lessons (four and one-half credits). Mr. Perry.
10. The Modern World, Part I (1500-1815). A study of the political and social history, primarily of Europe, from the Reformation period to the fall of Napoleon Bonaparte.
Twenty-seven lessons (five credits). Mr. Perry.
11. The Modern World, Part II (1815 to the present). The political and social history of Europe and the spread of European influences and rule, from the fall of Napoleon to the close of the World War.
Twenty-seven lessons (five credits). Mr. Perry.
15. English History, 1066 to Present, Part I—Medieval. A study of English history from the Norman Conquest to the accession of the Tudors. The work consists of a careful study of a narrative text and of a constitutional manual, supplemented by source study and collateral reading. Special emphasis is placed upon the beginnings of popular government as shown in jury trial, the limited monarchy idea, and the growth of the House of Commons.
Twenty-four lessons (four and one-half credits). Mr. Perry.
16. English History, 1066 to Present, Part II—Modern. A continuation of Part I, devoted to a study of English history from 1485 to the close of the World War. The emphasis is upon the seventeenth-century struggle for political liberty, and upon the reform movements of the nineteenth and twentieth centuries.
Twenty-four lessons (four and one-half credits). Mr. Perry.

20. United States History, Part I. This is the first half of a comprehensive course in American history. About one third of Part I is devoted to the colonial period, the remainder to the Revolution, the formation of the Constitution, and the early years of the nineteenth century (to 1836). The work consists of the study of a text, supplemented by a considerable amount of source study and collateral reading. The student is required to prepare written answers to questions based on the text and on the supplementary readings. Prerequisite for credit: six credits in history.

Twenty-four lessons (four and one-half credits). Mr. Perry.

21. United States History, Part II. A continuation of Part I, devoted mainly to a study of the period from the beginning of the slavery struggle down to 1914, with a brief survey of the part of the United States in the World War.

Twenty-four lessons (four and one-half credits). Mr. Perry.

HYGIENE

- 1.* Hygiene of Maternity and Infancy. Prepared by the Division of Child Hygiene of the Minnesota State Board of Health in co-operation with the United States Children's Bureau in work authorized under the Sheppard-Towner Act of November 1921. The first eight lessons take up personal and prenatal hygiene; care of the expectant mother; common complications and how to avoid them; preparation for confinement and after care of mother and child. The remaining lessons deal with the care and feeding of the baby; the well baby; the sick baby; growth, development, training. This course is given in co-operation with federal and state agencies without charge to the student.

Fifteen lessons (no credit). Dr. Boynton.

JOURNALISM

1. Reporting I.† Gathering and writing of news for newspapers; study of news values; exercises in journalistic style; analysis of newspapers. Part I takes up the study of news and news values, the requirements of style in straight news-writing, and the structure of news stories, based upon the study of newspapers.

Sixteen lessons (three credits). Mr. Barlow.

2. Reporting II.† Continuation of Part I. Emphasis upon the actual getting and writing of news for newspapers. Assignments will be of a practical nature, the stories to be written for publication.

Sixteen lessons (three credits). Mr. Barlow.

3. Reporting III.† Continuation of Part II. The practical getting and writing of news will be continued with emphasis upon the human interest and feature story.

Sixteen lessons (three credits). Mr. Barlow.

* Offered to residents of Minnesota only.

† No credit will be given until Courses 1, 2, and 3 are completed.

4. Editing I. The reading and preparation of copy for the printer; libel; study of type as applied to newspaper-making. Course in reporting or six months practical experience in reporting is a prerequisite.
Sixteen lessons (three credits). Mr. Barlow.
5. Editing II. Writing of headlines; headline design and typography; handling of all kinds of copy; press associations and syndicates.
Sixteen lessons (three credits). Mr. Barlow.
6. Editing III. Newspaper make-up, content, departments, typography; practice in handling copy and making up newspaper pages; rewrite and follow stories; the work of various editors; office system.
Sixteen lessons (three credits). Mr. Barlow.
- *20. Editorial-Writing I. Study of the style and structure of editorials; practice in writing various types of editorials.
Sixteen lessons (three credits). Mr. Barlow.
- *21. Editorial-Writing II. The writing of editorials is continued with the study of the editorial page, its functions, typography and special problems.
Sixteen lessons (three credits). Mr. Barlow.

LATIN

1. Beginning Latin I. Inflections; translation of easy Latin prose; the study of elementary syntax; Latin composition. Textbook: Bennett, *First Year Latin*.
Twenty-seven lessons (five credits). Mr. Cram.
2. Beginning Latin II. A continuation of Course 1. Translation of selections from Eutropius; forms; syntax; Latin composition. Textbook: Beeson and Scott, *New Second Latin Book*.
Twenty-seven lessons (five credits). Mr. Cram.
3. Caesar I. Translation of the Helvetian Campaign (Book I, chs. 1-29) and of the Campaign against the Belgians (Book II entire); syntax; composition. Textbooks: Beeson and Scott, *New Second Latin Book*, Bennett's *Latin Grammar*, and Bennett's *New Latin Composition*.
Twenty lessons (four credits). Mr. Cram.
4. Caesar II. Translations of the Second Expedition into Britain (Book V, chs. 1-23) and of the Manners and Customs of the Gauls and Germans (Book VI, chs. 9-29); syntax; composition. Textbooks: same as in Course 3. Prerequisite: Course 3 or equivalent.
Twenty lessons (four credits). Mr. Cram.
5. Cicero I. Translation of the First and Second Oration against Cataline and of selected Letters; syntax; composition; life of Cicero. Textbooks: Kelsey's *Cicero*, Bennett's *Grammar* and *New Latin Composition*. Open to those who have completed two years of preparatory Latin.
Twenty-seven lessons (five credits). Mr. Cram.
6. Cicero II. Translation of the Oration for the Manilian Law (the equivalent of two orations), the Archias, and the Marcellus; syntax; composition. Textbooks: same as in Course 5. Prerequisite: Course 5.
Twenty-seven lessons (five credits). Mr. Cram.

* Both parts must be completed before credit will be given for a degree.

7. Virgil's *Aeneid* I. The course will cover the first two books of the *Aeneid* and include the study of the life and times of Virgil, the principles of Latin prosody, the literary style of the *Aeneid*, and, to a limited extent, Roman mythology. Open to those who have completed three years of preparatory Latin.
Twenty-four lessons (four and one-half credits). Mr. Pike.
8. Virgil's *Aeneid* II. Books 3, 4, 6 of the *Aeneid*. Textbooks: *Virgil's Aeneid* by Charles Knapp, Bennett's *Latin Grammar*. The student will, besides, be expected to read and report on Sellar's *Virgil*. Open to those who have completed Course 7.
Twenty-seven lessons (five credits). Mr. Pike.
9. Livy, Book I. The work will comprise the study of the text, the life, times, and literary style of Livy, and, in some measure, early Roman institutions, and lastly, Latin composition. Textbooks, Westcott's *Livy*, Book I, Bennett's *Latin Grammar*, and White's *Latin-English Lexicon*. The student will also read and report on Ihne's *Early Rome*. Open to those who have completed four years of preparatory Latin.
Twenty-four lessons (four and one-half credits). Mr. Pike.
10. Plautus and Terence: Selections. The course will consist of a study of the texts, the literary styles of Plautus and Terence, and an outline of the history and technique of the Roman drama. Textbooks: *Plautus Menacchini* by Fowler, *Terence's Phormio* by Elmer, and White's *Latin-English Lexicon*. The student will also be required to read and report upon Sellar's *Plautus and Terence in The Roman Poets of the Republic*. Open to those who have completed Course 7.
Twenty-four lessons (four and one-half credits). Mr. Pike.

MATHEMATICS*

PREPARATORY COURSES

1. Elementary Algebra A. A course for students who have never studied algebra. The course treats positive and negative numbers; addition, subtraction, multiplication, and division of monomials and polynomials; simple equations in one unknown quantity; elementary special products and factoring; highest common factor and lowest common multiple. Prerequisite: common school arithmetic.
Twenty lessons (one entrance credit). Mr. Edwards.
2. Elementary Algebra B. This course, with Course 1, constitutes one entrance unit in mathematics. The course treats addition, subtraction, multiplication, and division of fractions including complex fractions; equations in one unknown quantity which involve fractions; graphical representation; simultaneous equations of the first degree; square roots and quadratic surds; quadratic equations in one unknown quantity. Prerequisite: Course 1.
Twenty lessons (one entrance credit). Mr. Edwards.

* See also Engineering, Courses 1, 2, 19.

3. **Plane Geometry A.** The work of this course is elementary geometry, Books I and II. Rectilinear figures and the circle, with the miscellaneous original exercises and some elementary construction problems. Prerequisite: Courses 1 and 2.
Twenty lessons (one entrance credit). Mr. Edwards.
4. **Plane Geometry B.** This course treats proportion, similar triangles, proportional properties of line segments, proportional properties of chords and secants, trigonometric ratios, areas of polygons, regular polygons and circles. Prerequisite: Course 3.
Twenty lessons (one entrance credit). Mr. Edwards.
5. **Solid Geometry.** This course is designed not only to give a knowledge of the standard theorems and exercises of the text, but to develop the student's own imagination and initiative and to give a well-rounded view of the subject by practice in special proofs and original exercises. Prerequisites: Courses 3, 4, or equivalent.
Twenty-four lessons (one entrance credit). Mr. Edwards.
- Note.—Courses 2 and 5 satisfy the requirements of the School of Mines course, Mine Plant 1.

COLLEGE COURSES

6. **Higher Algebra, Part I.** Brief review of Courses 1 and 2, linear equations in one, two, and three unknowns, with solution by determinants, ratio and proportion, variation, quadratic equations in one and two unknowns, graphs, completion of quadratic equations, progressions, equations in quadratic form, binomial theorem. Prerequisite: Courses 1 and 2, or equivalent.
Twenty-seven lessons (five credits). Mr. Teeter.
- Note.—Courses 5 and 6 meet the extra high school requirements in mathematics of the College of Engineering.
7. **Higher Algebra, Part II.** A continuation of Part I, including a study of variations, quadratic equations, special higher equations, simultaneous equations of the second degree, maxima and minima of functions, logarithms, theory of equations, and solution of numerical higher equations.
Twenty-seven lessons (five credits). Mr. Teeter.
- Note.—Courses 6 and 7 satisfy the requirements of the School of Mines course, Mine Plant 2 and 3.
8. **Trigonometry.** A course in plane and spherical trigonometry, designed to meet the needs of beginners and to include the subject usually considered in the ordinary college course. The solution of triangles is treated quite fully but not to the exclusion of analytical trigonometry. Prerequisite: Course 6 and logarithms. (Students who did not have logarithms in higher algebra may secure special lessons in this subject.)
Twenty-seven lessons (five credits). Mr. Teeter.
- Note.—Course 8 satisfies the requirement of the School of Mines course, Mine Plant 4.

9. **Plane Analytic Geometry.** This course treats systems of co-ordinates, loci, the type forms of the equation of the straight line with application; the circle, central and general conic sections, tangents, diameters, asymptotes, some higher plane curves, parametric loci, polar curves. The fundamental problem of the equation and its locus forms the basis of the course. Prerequisite: Courses 7 and 8.

Twenty-seven lessons (five credits). Mr. Teeter.

Note.—Course 9 satisfies the requirement of the School of Mines course, Mine Plant 5.

Descriptive Geometry. See Engineering 19.

10. **Differential Calculus.** A first course in differential calculus treating differentiation of algebraic and transcendental functions with attention to the notion of the limit of a function, continuity of a function, and the derivative. Extensive practice in the technique of differentiation by means of exercises and applications to maxima and minima, tangents, normals, curvature, singular points, velocity, and acceleration. Elementary discussion of Rolle's theorem and the law of the mean, indeterminate forms, and partial differentiation. The course is based upon a textbook with supplementary written lectures and exercises upon many of the topics. Prerequisites: Courses 7, 8, and 9.

Twenty-seven lessons (five credits). Mr. Edwards.

11. **Integral Calculus.** First course in integral calculus. The integration of various types of functions, the definite integral with applications to areas, surfaces, and volumes of geometric figures, rectification of curves and simple problems of mechanics. Much practice in the technique of integration and the use of tables of integrals, the evaluation of simple double and triple integrals. Prerequisite: Differential Calculus.

Twenty-seven lessons (five credits). Mr. Edwards.

Note.—Courses 10 and 11 satisfy the requirements of the School of Mines courses, Mine Plant 6, 7, and 8.

12. **Differential Equations.** A study of the elementary differential equations with emphasis on applications to geometry, elementary mechanics, physics, and engineering.

Twenty-seven lessons (five credits). Mr. Teeter.

MUSIC

1. **Harmony.** Scales, major and minor; intervals; formation of triads, their inversion; the dominant seventh chord, its inversions; modulation; suspension, organ-point, etc. Registration subject to approval of previous preparation in music, which must be fully stated upon application.

Twenty-four lessons (four and one-half credits). Mr. Scott.

PHYSICS

PREPARATORY COURSES

1. Elementary Physics A. Weights and measures, simple machines, mechanics of liquids, mechanics of gases, non-parallel forces, elasticity and strength of materials, accelerated motion, force and acceleration, energy and momentum, heat—expansion and transmission—water, ice, and steam, heat engines.

Sixteen lessons (no credits). Mr. Teeter.

2. Elementary Physics B. Magnetism, the beginnings of electricity, battery currents, measuring electricity, induced currents, electric power, alternating current machines; sound; lamps, and reflectors, lenses and optical instruments, spectra and color, electric waves, Roentgen rays.

Sixteen lessons (no credits). Mr. Teeter.

Note.—These preparatory courses in physics are without laboratory work; hence carry no entrance credit. They do, however, meet the physics requirements of the College of Dentistry and will prepare students for examination for first grade county certificates.

COLLEGE COURSES*

1. Elements of Mechanics and Sound. An elementary university course in the fundamental principles of mechanics and sound. Theoretical course without laboratory work. One year of high school physics is prerequisite.

Sixteen lessons (three credits). Mr. Edwards.

2. Heat. An elementary university course in the general principles of heat, without laboratory work. Prerequisite: Course 1.

Sixteen lessons (three credits). Mr. Edwards.

3. Optics. An elementary university course in the fundamental principles of light. Prerequisite: Course 1.

Sixteen lessons (three credits). Mr. Edwards.

4. Magnetism and Electricity. An elementary university course in the principles underlying electrical and magnetic phenomena. Prerequisite: Course 1.

Sixteen lessons (three credits). Mr. Edwards.

POLITICAL SCIENCE

1. American Government. An elementary course in American government and politics intended as a preparation for teaching in secondary schools and for good citizenship. The course deals with the national government, treating its nature and origin. Special attention will be given to the organization of the executive, legislative, and judicial branches of the government, together with the various powers and duties of each department; to the conduct of foreign affairs; and to the present problems of national government.

Twenty-seven lessons (five credits). Mr. Huntley.

* Courses in physics carry no pre-med credit. All applications for college physics are subject to approval by the department.

- 2.* Municipal Government. A study of the city problems in the United States. Organization, functions, and administration. Forms of charters. Commission and manager plans. Home rule. Inefficiency, corruption. Civil service and other reform measures. Finance, health, police, education, and other activities. Prerequisite for credit: Course 1.

Twenty-four lessons (four and one-half credits). Mr. Anderson.

3. State and Local Government. A complementary course to Course 1. The constitutional basis of state government; relation of the state to the national and local governments, and to the citizen; organization, functions, and actual workings of state governments, and of county, township, and city governments; public opinion and popular control in state governments; nominations and elections, initiative, referendum and recall; taxation and finance; social and regulatory legislation.

Twenty-seven lessons (five credits). Mr. Huntley.

4. International Law. Recognition, extinction, and succession of states; inviolability of territory; freedom of the seas. Declaration of war; rules of war on land and on sea. Neutrality and neutral rights; blockade, contraband, unneutral service, visit and search. Mediation, arbitration, and judicial settlement of international disputes. A world court. Prerequisite for credit: Course 1.

Twenty-four lessons (four and one-half credits). Mr. Quigley.

5. Political Parties. A course dealing with the nature, functions, organization, and methods of political parties and public opinion as a factor in representative government. The lessons cover the methods of nominating public officers, the conduct of election campaigns, the election law of Minnesota, the operation of political parties in the actual control of government. Careful study is made of a number of specific problems of democracy including the direct primary, corrupt practices, boss rule, the spoils system and the civil service, the initiative, referendum and recall, and the short ballot.

Twenty-seven lessons (five credits). Mr. Gaus.

PSYCHOLOGY

1. General Psychology I. The purpose of this course is to acquaint the student with the general characteristics and laws of mental life and with the aims and methods of modern psychology.

Sixteen lessons (three credits). Mr. Foster.

2. General Psychology II. The study of mental development in its relation to heredity and training, with an investigation of the facts and theories of childhood and adolescence with special reference to their bearing on education. Prerequisite: Course 1.

Sixteen lessons (three credits). Mr. Foster.

* New registrations for the course in Municipal Government will not be accepted until further notice.

3. Applied Psychology. A survey of practical applications of psychology. Special topics considered are: methods of selecting employees; history and evaluation of attempts at character analysis; measurement of mental traits; improving efficiency in office and shop; problems of advertising and selling. Prerequisite: Psychology 1 and 2.
Sixteen lessons (three credits).
Note.—See also Education, Course 2.

ROMANCE LANGUAGES

FRENCH

1. Beginning French I. French grammar and reader; modern texts.
Twenty-seven lessons (five credits). Mr. Frelin.
2. Beginning French II. A continuation of Course 1, which is prerequisite to it.
Twenty-seven lessons (five credits). Mr. Frelin.
3. Intermediate French I. Review of grammar; composition, reading of representative authors. Prerequisite: Courses 1 and 2 or equivalent.
Twenty-seven lessons (five credits). Mr. Frelin.
4. Intermediate French II. A continuation of Course 3. Prerequisite: Course 3.
Twenty-seven lessons (five credits). Mr. Frelin.
8. Scientific French I. Readings from general works on scientific subjects. Particularly valuable to pre-medical students and others who expect to take up courses in science. Prerequisite: Courses 1, 2, 3, and 4.
Sixteen lessons (three credits). Mr. Frelin.
9. Scientific French II. A continuation of Course 8.
Sixteen lessons (three credits). Mr. Frelin.
10. Scientific French III. A continuation of Course 9.
Sixteen lessons (three credits). Mr. Frelin.
53. Elementary French Composition. This course is designed to train the student in the use of French. It presupposes a knowledge of intermediate French. It consists of translations of passages of connected prose dealing with everyday life in France, such as traveling, shopping, going to the theater, etc. Towards the end of the course, the student is expected to translate short clippings from newspapers. Prerequisite: Courses 1, 2, 3, and 4.
Sixteen lessons (three credits). Mr. King.
59. Advanced French Composition. A continuation of Course 53. It affords practical exercises in prose composition. Prerequisite: Course 53 or equivalent.
Sixteen lessons (three credits). Mr. King.

SPANISH

1. Beginning Spanish I. Grammar and reading. In this course stress will be laid upon grammar, accurate translation, and composition. Exercises in phonetic equivalents will be given with the view of acquiring a careful pronunciation.
Twenty-seven lessons (five credits). Mr. Sirich.

2. Beginning Spanish II. A continuation of Course 1.
Twenty-seven lessons (five credits). Mr. Sirich.
3. Intermediate Spanish I. Review of grammar; composition, reading of modern Spanish texts. Prerequisite: Courses 1 and 2 or equivalent.
Twenty-seven lessons (five credits). Mr. Sirich.
4. Intermediate Spanish II. A continuation of Course 3. Prerequisite: Courses 1, 2, and 3.
Twenty-seven lessons (five credits). Mr. Sirich.
53. Elementary Spanish Composition. Connected prose composition dealing with everyday life in Spain. The aim is the ability to write Spanish. Prerequisite Courses 1, 2, 3, and 4 or equivalent.
Sixteen lessons (three credits). Mr. King.
59. Advanced Spanish Composition. A continuation of Course 53, which is prerequisite.
Sixteen lessons (three credits). Mr. King.

SCANDINAVIAN

NORWEGIAN

1. Beginning Norwegian I. Elementary study of the language: grammar, composition, select readings in easy prose and poetry.
Twenty lessons (four credits). Mr. Bothne.
2. Beginning Norwegian II. A continuation of Course 1, which is prerequisite.
Twenty lessons (four credits). Mr. Bothne.
3. Intermediate Norwegian I. Grammar; composition; elementary history of literature; select works of modern authors. Prerequisite: Courses 1 and 2 or equivalent.
Twenty lessons (four credits). Mr. Bothne.
4. Intermediate Norwegian II. A continuation of Course 3.
Twenty lessons (four credits). Mr. Bothne.
5. Advanced Norwegian I. The reading of representative prose and poetry. Prerequisite: Courses 1, 2, 3, and 4 or equivalent.
Twenty-four lessons (four and one-half credits). Mr. Bothne.
6. Advanced Norwegian II. A continuation of Course 5. Reading in prose and verse.
Twenty-four lessons (four and one-half credits). Mr. Bothne.

SWEDISH

1. Beginning Swedish I. Grammar and composition; select readings in easy prose and verse.
Twenty lessons (four credits). Mr. Stomberg.
2. Beginning Swedish II. A continuation of Course 1, which is prerequisite.
Twenty lessons (four credits). Mr. Stomberg.
3. Intermediate Swedish I. Grammar; composition; easy reading. Prerequisite: Courses 1 and 2.
Twenty lessons (four credits). Mr. Stomberg.
4. Intermediate Swedish II. A continuation of Course 3.
Twenty lessons (four credits). Mr. Stomberg.

107. Swedish Literature I. History of Swedish literature from 1718 to the present time. History of the literature, and study of modern authors, including Selma Lagerlöf, Gerierstam, Strindberg. Prerequisite: Courses 1, 2, 3, 4, and advanced Swedish. No credit is given until Courses 107-108-109 are completed.

Sixteen lessons (three credits). Mr. Stomberg.

108. Swedish Literature II. A continuation of Course 107. Open to advanced students. No credit is given until Courses 107-108-109 are completed.

Sixteen lessons (three credits). Mr. Stomberg.

109. Swedish Literature III. A continuation of Course 108. No credit is given until Courses 107-108-109 are completed.

Sixteen lessons (three credits). Mr. Stomberg.

SOCIAL SCIENCE

PREPARATORY COURSE

1. Social Science A. This is a course whose primary aim is to give citizens an insight into the world in which they are living—an insight which will enable them to understand the economic, social, and political happenings of everyday existence and through their understanding to live more useful lives. Since present institutions are the outgrowth of past experience, the first few weeks will be spent in an historical survey of man's progress up through the industrial revolution. The remaining three quarters of Part A is devoted to a study of the present economic organization of society. Production, consumption, exchange, and transportation are taken up in turn. Much attention is given to certain fundamental principles which should underlie all business dealings.

Twenty lessons (one entrance credit). Mr. Lundquist.

SOCIOLOGY

- I. Introduction to Sociology. A study of the evolution and present organization of human society. The evolution of typical social institutions, such as the family, industry, and the state; the influence of the biological and environmental (both physical and social) factors upon man in his social relationships; an introductory analysis of some of the leading social problems of the time; a study of the methods of social organization and control, especially from the standpoints of tradition, custom, and science. This course is intended to serve (1) as an introduction to other more specialized courses in sociology, (2) as a background for a better understanding of the society in which we live and of its problems.

Twenty-seven lessons (five credits). Mr. Lundquist.

2. Rural Sociology. A study of the conditions and problems of country life. Analysis of environmental, human, and general social conditions; how soil, climate, etc., the quantity and quality of the rural population, the interaction of city and county determine the type of rural communi-

ties. Problems of sanitation, co-operation, education, religion, recreation, crime, and dependency growing out of these conditions. This course has been thoroly revised.

Twenty-seven lessons (five credits). Mr. Lundquist.

10. Rural Community Organization. This course is intended for those working in the rural community and small towns and considers more technical problems than those discussed in the course in Rural Sociology. The subjects covered include co-operation, organization for health and sanitation, the social work of the church and schools, organized recreation, clubs, social centers, the organization and co-operation of rural social agencies, small town and county organization, social surveys. Should be preceded by Course 2 (Rural Sociology), but may be taken independently by those who have a special interest in the subject.

Sixteen lessons (three credits). Mr. Lundquist.

11. Social Organization. A study of the foundations of democracy, including the organization and structure of groups, the development of social ideals, the factors producing disorganization and reorganization of institutions, and the methods of promoting an intelligent and lasting democracy. Prerequisite: Course 1 or equivalent.

Sixteen lessons (three credits). Mr. Finney.

14. Social Progress. A study of the conditions, causes, and criteria of social progress, with the probable limits thereto. Besides the lessons based on the assigned reading, the student will be expected to prepare a paper, either in fundamental criticism of some work on social progress, or in the nature of an original study based on the critical use of library materials. This course is open only to those who have taken Introduction to Sociology and Social Organization, either by correspondence or in residence.

Sixteen lessons (three credits). Mr. Finney.

52. Field Work in Rural Sociology. Students who have completed the work in Rural Sociology (Sociology 2) or its equivalent may, with the consent of the instructor, enroll for more advanced work on some selected rural community problem. The work will consist of the application of the survey method to the study of the problem selected. Schedules will be provided through the Correspondence Department. The student will collect the data and will be responsible for some preliminary interpretation of this data. The accuracy of the completed schedules, which will be returned to the instructor, and the ability shown in interpreting the data collected will serve as a basis for judging the quality of the work done. One, two, or three hours' credits, according to amount of work done. Mr. Lundquist.

119. The Family. The evolution of the family; its various forms and their relation to other social institutions; the rôle of the family in social evolution; contemporary problems of the family. Prerequisite: four courses in sociology or the equivalent.

Sixteen lessons (three credits). Mr. Elmer.

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Second Term August 1 to September 5



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CALENDAR
SUMMER SESSION 1925

June	19-20	Fri.-Sat.	Registration days, first term
June	22	Monday	First term classes begin
July	4	Saturday	Independence Day; a holiday
August	1	Saturday	First term closes
August	1	Saturday	Registration for second term closes
August	3	Monday	Second term classes begin
September	5	Saturday	Second term closes

THE SUMMER SESSION

THE BOARD OF REGENTS

The Hon. Fred B. Snyder, Minneapolis, President of the Board	
Lotus Delta Coffman, Minneapolis - - - - -	<i>Ex officio</i>
The President of the University	
The Hon. Theodore Christianson, St. Paul - - - - -	<i>Ex officio</i>
The Governor of the State	
The Hon. J. M. McConnell, St. Paul - - - - -	<i>Ex officio</i>
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THE SUMMER SESSION

I. GENERAL INFORMATION

The Summer Session of the University of Minnesota is a regularly established division of the University. Its courses are designed (1) for graduate and undergraduate students who wish to reduce their period of residence at the University by accumulating extra credits during the summer; (2) for teachers and others of professional interests who desire further training in their professions; (3) for persons who seek an opportunity to study for intellectual pleasure; (4) for graduates of accredited high schools who do not meet the special subject-matter requirements to enter some of the colleges and professional schools; (5) for high school graduates who wish to become acquainted with the methods of instruction and the policies and practices in collegiate work before registering in the regular session during the academic year.

LOCATION

The main campus of the University of Minnesota is located on the east bank of the Mississippi River in the city of Minneapolis. The summer courses, with the exception of those in agriculture and in home economics, are given on the Minneapolis campus. The University buildings, libraries, laboratories, observatory, and museums are at the service of the summer students. In addition to the equipment of the University, there are a number of public and semipublic libraries in St. Paul and Minneapolis available for the students' use.

The courses in agriculture and home economics are given on the University Farm campus, one of the beautiful spots of the Twin Cities. The College of Agriculture has its own library, laboratories, museums, gymnasium, tennis courts, and grounds for other sports. It also offers the advantages of the main campus, for it is connected with the latter by an intercampus trolley line which gives a regular thirty-minute service. The Como-Harriet interurban line between the two cities is only a short distance from the college campus, so that the libraries, art galleries, lecture courses, and recreational facilities in both cities are accessible.

DURATION OF THE SESSION

The Summer Session consists of two terms. The first term, of six weeks, begins Friday, June 19, and closes Saturday, August 1. The second term, of five weeks, begins Saturday, August 1, and closes Saturday, September 5. Saturday, July 4, will be observed as a holiday.

GENERAL OFFICES

The office of the director of the Summer Session is on the second floor of the new Administration Building. The offices of the registrar and cashier are on the first floor of the new Administration Building, and for the convenience of students registering in agriculture and home economics,

branch offices are established on the second floor of the Administration Building, University Farm. Details of procedures to be followed in registering will be given out at these places.

DEGREES

Regular collegiate credit is given for summer session work to qualified students. For a detailed statement of the credit requirements for the various degrees, see the general information bulletin for 1924-25, pages 12-20; and the bulletins of the various schools and colleges of the University for the same year.

The University requires at least one year of residence for any degree; and if the term of residence is only one year, that must be the senior year. In any case two quarters of the senior year must be spent in residence. Work completed in the Summer Session is considered as residence credit.

CREDIT

Credit is administered on the following basis: One quarter credit requires in general 12 lecture or recitation periods (two per week for a summer term) requiring two hours of preparation each; or, 24 periods of laboratory work requiring one-half hour of preparation each; or 36 hours of laboratory work with no preparation. Courses carrying two or more units of credit require corresponding multiples of these amounts.

AMOUNT OF WORK

A maximum of nine quarter credit hours is considered a full program for either term. Registration for a greater number requires special permission from the Students' Work Committee, of which Dean Nicholson is chairman.

Examinations are held at the last scheduled class hour for each course.

GRADING SYSTEM

There are four passing grades, A, B, C, and D, representing varying degrees of achievement, which are acceptable for the completion of a single course.

There are two grades indicating work of distinctly unsatisfactory quality. These grades are E (condition), which may be removed by examination or other means stipulated by the faculty of the college or school concerned, and F (failure), which may be converted into a higher grade only by a repetition of the work in the course or, in exceptional cases, by examination by permission of the faculty concerned.

The grade I (incomplete), indicates that a student, for reasons satisfactory to the instructor in charge, has been unable to complete the work of the course. This grade is given only when the work already done has been of quality acceptable for the completion of the course. Any student receiving this grade will be given an opportunity to complete the said course within the first thirty days of his next quarter in residence.

RECREATION

It is generally recognized that those who engage in study during the summer months demand, and should have, a large opportunity for recreation. The inactivity during the summer of most of the agencies for extra-curricular activity, which function during the regular university year, makes desirable the organization in the summer session program of a very definite unit for recreation. This the University of Minnesota does in a very complete, and in some ways unique, manner. The offering made is rich and varied; it is under the personal supervision of the associate director; and there is a definite provision for its financial support so that practically all of it is available to students without extra charges, or, at most, with only nominal incidental expense.

The Twin Cities, Minneapolis and St. Paul, offer many attractions for the summer visitor. As a center of art, music, and education they are well known; and the numerous institutions of both cities include libraries and museums which cannot be enumerated here. As a center of outdoor life they are becoming equally famous. Not only are there several large lakes within the boundaries of the cities, to say nothing of all the small ones in the park system, but here is located the gateway to the countless resorts on the famous 10,000 lakes of Minnesota. Information regarding all these facilities is made easily accessible and frequent excursions are made to local points of historical, industrial, or purely recreational interest.

An extended series of lectures is provided throughout the summer. During the first term there is a series of weekly convocations, for which the third hour of each Thursday is left free of classes. These convocations are addressed by men of national prominence in educational and other fields. The series is supplemented by many lectures on various topics, by members of the University faculty and by invited visitors. Many of these are illustrated and the element of attractiveness is not neglected.

One or more musical recitals is provided each week throughout the summer. These are given by members of the music faculty, by recognized artists of the Twin Cities, or by such visiting performers as may be available. The programs aim to give immediate pleasure as well as to inculcate a finer appreciation of musical values. These recitals, like the lectures, are free to students, and for the most part are open to the public. For those students who desire something more definite in the way of music appreciation, particularly teachers who wish material for their school use, a short course of lecture-demonstrations is provided during the first term. This is open to all students and is given at hours to accommodate those who desire to attend.

A series of dramatic performances, and showings of motion pictures, are also highly satisfying offerings. Excellent facilities for these attractions are furnished in the music auditorium, which is one of the features of the Music Building—one of the finest buildings for music purposes to be found at a state university. This auditorium is equipped with a stage fitted for large dramatic or operatic performances, a four-manual organ, and motion

picture projection apparatus of the highest efficiency. Legitimate dramatic performances are provided by the best organizations available; and the motion pictures selected are the best, in kind and quality, that can be secured. Students and teachers who are interested in either of these phases of stage entertainment will find much to enjoy, and in addition may receive valuable suggestions for their own use.

As a combination of musical and dramatic efforts a pageant is planned for performance in the new million dollar Minnesota Stadium. Use will be made of a special stage, and of sound-reflecting devices by which 15,000 people will be able to hear as well as witness the performance. The pageant chosen is "Pan in America," the work which was awarded the prize by the National Federation of Music Clubs and which was presented by them at the biennial convention at Asheville in 1923. Opportunity for participation will be open to students with musical, dramatic, or dancing ability; and those interested in pageantry should make use of this opportunity.

Gatherings of a purely social nature are frequent and varied. Many of these are of an entirely informal and spontaneous nature, arising within groups having similar interests. Others are definitely planned and organized with the idea of promoting wider acquaintanceships among both students and faculty.

Especial attention is given to the matter of physical recreation, entirely supplementary to the courses in physical education. Three gymnasiums, with swimming pools and directed physical training, are open for regular use. The men's gymnasium with all its equipment of bars, rings, mats, horses, and the like, and Northrop field, with its baseball diamonds, track, volley, and diamond ball fields and equipment, are available for men's use daily. The swimming pool is available the larger part of each day, at published hours. These facilities, supplemented by such advice and instruction as may be asked for, are offered without charge, except for such locker and towel services as are desired. Instructors and attendants are on duty at all times. Tennis and golf tournaments are open to all students; and baseball will be represented by a summer session team.

The women's gymnasium affords a large service, and the swimming pool is made particularly available for purely recreative use as well as for instruction. The gymnasium on the University Farm campus offers opportunity for students enrolled in the College of Agriculture. The facilities, including the swimming pool, are open for men and for women, on alternate days. Locker and towel services can be secured in each of these gymnasiums.

Thirty tennis courts are available for daily use except on Sundays. They are ruled and re-lined regularly, and provided with nets. A system of reservation has been established whereby any court may be reserved for a period of one and a half hours, between 9:00 a.m. and 7:30 p.m., thus making it possible for students to plan their recreation in definite relation to their program of study. Use of the courts, as well as entry in the tennis tournament, is open to both men and women students.

MINNESOTA UNION

The Minnesota Union is a men's clubhouse, furnishing social and recreational facilities and operating a soda fountain. There are also a ball-room, reception rooms, reading rooms, and lounging rooms. These rooms and their facilities are open to all men students of the session.

The Minnesota Union cafeteria will be open during the Summer Session.

Room 202, Administration Building, University Farm, is used as a reading room and social room for men students on the University Farm campus.

SHEVLIN HALL

Shevlin Hall affords to women students what the Minnesota Union does to men. It contains rest and study rooms, rooms for social gatherings, the offices of the dean of women, and the Housing Bureau.

For women students on the University Farm campus similar facilities are available in the Home Economics Building.

UNIVERSITY POST-OFFICE

The University post-office, for distribution of mail addressed to the University, is located in the basement of the new Administration Building. The University Farm post-office is in the Administration Building. At the time of registration each student is assigned a post-office box in which he will receive all mail, announcements, and University communications. The mail box should be visited at least once a day. When leaving at the close of a session, students should give the postmaster a forwarding address.

OFFICIAL DAILY BULLETIN

Throughout the year an *Official Daily Bulletin* is issued, containing announcements to students and faculty. During the summer it also contains other information, programs of the various recreational activities, and matters of general interest which would ordinarily be found only in a daily student newspaper. The bulletin is delivered to offices and laboratories, and to the post-office box of every student early each morning except Monday. Each student is held responsible for the official notices appearing in the bulletin.

STUDENTS' HEALTH SERVICE

The Students' Health Service is conducted during the Summer Session on the same basis as during the regular school year, the same staff of physicians, dentists, and nurses being on duty. The Health Service operates, exclusively for students, a general infirmary in addition to dispensary clinics in medicine, surgery, dermatology, ophthalmology, oto-laryngology, and dentistry. Here any student may receive a complete physical examination or medical consultation without charge beyond the health fee, which is paid as part of the tuition. For surgical operations, special drugs, dentistry, and hospital board, a charge on a strictly cost basis is made. This service is maintained by the University to help each student to possess a healthy, active body, thereby contributing to his success while in college and in later

life; and to reduce to the minimum that prodigious academic and economic loss due to indisposition and illness of students.

THE INTERCAMPUS CAR

For students who are registered for class work on both the Minneapolis campus and the University Farm campus, free transportation on the intercampus car is provided by tickets issued from the registrar's office.

Students who attend classes on the Minneapolis campus and who live in the College of Agriculture dormitories will also be given free transportation on the intercampus car line.

SUMMER EMPLOYMENT

Students are not advised to engage in extra work during the summer; a full program of study during the warm weather should, with reasonable recreation, be a sufficiently heavy load. But for the benefit of those who feel compelled to aid themselves financially while in attendance, the service of the University Employment Bureau is always available. There is considerable demand for services during the summer at good rates of remuneration, and many students are aided in this way. The bureau is on the basement floor of the new Administration Building.

TEACHERS' EXAMINATIONS

Examinations for state teacher's certificates will be conducted by the State Department of Education at the University during the Summer Session. The dates of the examinations will be July 27, 28, 29, and 30.

THE UNIVERSITY LIBRARY

The University Library, which includes the general library and the college and departmental libraries, is open to all students of the Summer Session. It includes about 425,000 volumes and many periodicals and pamphlets on all subjects in the University curriculum.

The largest part of the library is housed in the new Library Building on the Minneapolis campus. This is the latest and one of the best university library buildings in the country. Its spacious reading rooms and a special floor with seminar library groups and discussion rooms for advanced students afford a greater seating capacity than any similar building yet erected. The library of the Department of Agriculture, with an excellent collection on agriculture and home economics, is located in the Administration Building at the University Farm. Branch libraries are maintained in a few of the schools and colleges, and there are smaller special collections conveniently grouped in the new Library.

The Library Handbook, copies of which may be had gratis upon application at the library, contains information regarding library hours, rules, and other matters essential to the profitable use of the library.

LIVING EXPENSES

The living expenses for students at the University are never very high, and this is true especially for the Summer Session. Good accommodations for room and board may be had from \$9 to \$12 per week.

Several good restaurants are to be found in the immediate vicinity of the University. Further information concerning room and board may be obtained by addressing Mrs. Mary Staples, Shevlin Hall. *It is generally more satisfactory to engage accommodations after arrival than to make reservations in advance.*

SANFORD HALL

Sanford Hall, a residence hall for women, is on the Minneapolis campus. It accommodates 200 students. The building has every modern convenience. All rooms have hot and cold water, and each double room has two closets.

The furniture consists of a cot, dresser, a study table, easy chair, straight chair, and rug for each student. All bedding and the laundry for the same is furnished.

The rates during the Summer Session are as follows:

Board and room when occupying a single room, \$60 for each six weeks.

Board and room when sharing a double room, \$50 for each six weeks.

Applications should be sent direct to Sanford Hall, University of Minnesota. No application will be recorded until a deposit fee of \$2 is received. This deposit will hold the room until the day after the opening of the Summer Session, and is refunded when the residence fee is paid.

Sanford Hall will be open during the second Summer Session if there is a sufficient demand.

MEN'S COTTAGES

The University operates five cottages for the accommodation of men students. Room rental for the Summer Session will be fifteen to eighteen dollars (\$15 to \$18) in double rooms and eighteen to twenty-one dollars (\$18 to \$21) for single rooms for either term. The dining hall is not open in summer. For reservations, apply to Mrs. Mary E. Staples, director of housing.

DEPARTMENT OF AGRICULTURE DORMITORIES

Those taking regular work during the Summer Session either on the Minneapolis campus or on the Farm campus may obtain rooms in the Department of Agriculture dormitories. The dormitories for women contain a few single rooms; other rooms are intended to accommodate two persons. The rooms are furnished with necessary bedding and hand towels.

The expenses for room rent, use of bedding, and laundering of the same are \$2.50 per week for one student in a room and \$2 per week for more than one student in a room.

Rooms will be assigned, during registration, in the Administration Building. Payment for the first term of the Summer Session must be made to the cashier, University Farm, at the time of assignment. Dormitories will be open Saturday, June 20. These dormitories will not be available for the second term of the Summer Session.

A cafeteria with reasonable charges is maintained on the Farm campus.

BUREAU OF APPOINTMENTS

The Bureau of Appointments of the College of Education is operative during the Summer Session. Students who have done sufficient work at the University of Minnesota to secure academic standing here are eligible to the services of the bureau. The office is located at Room 102, Education Building.

CORRESPONDENCE COURSES

The Correspondence Study Department of the General Extension Division affords an opportunity to students who come to the University only for the Summer Session to continue their studies during the remainder of the year, and thus to accumulate additional credit toward their degrees as well as to secure the training which regular study gives. On the other hand, students who are now pursuing correspondence courses have in the Summer Session a chance to complete some of their resident work at a time when many of them are free to do so. All those who come to the Summer Session are urged to call at the offices of the General Extension Division to become acquainted with its work. Full information concerning correspondence courses may be had at any time by addressing the Correspondence Study Department, General Extension Division, fourth floor, new Administration Building.

INFORMATION

Correspondence with reference to the Summer Session and requests for circulars and additional information may be addressed to the director, Summer Session, or the registrar, University of Minnesota, Minneapolis, Minnesota.

II. ADMISSION AND REGISTRATION

ADMISSION

The courses of the Summer Session are open to all standard high school graduates and to mature men and women who, after consultation with their respective instructors, are considered qualified to pursue the chosen work to advantage, but college credit will be given only when college entrance requirements have been fulfilled. Those who desire college credit for their work, and those who desire advanced standing for college work done elsewhere, should submit their credentials, consisting of official transcripts of their high school, normal school, or college work.

Students should consult the statements under each college announcement in this bulletin for detailed information concerning admission to that college. This information may also be found in the general information bulletin which may be obtained at the office of the registrar.

REGISTRATION

In order that the short six weeks' terms may prove of maximum value, and that the work of the courses may not be interfered with by late entrants, students must complete their registration, including the payment of their fees, on the days set aside for registration, or pay a late registration fee.

The regular registration days are:

For the first term, Friday, June 19, 9 a.m. to 4 p.m., and
Saturday, June 20, 9 a.m. to 3 p.m.

For the second term, Saturday, August 1, 9 a.m. to 3 p.m.

The late registration fees are as follows:

For the first term, For those completing their registration on
Monday, June 22..... \$2.00
Tuesday, June 23..... 3.00
Wednesday, June 24 ... 4.00
Thursday, June 25 5.00

No registrations are allowed for the first term after Thursday, June 25, without the special permission of the director, and the payment of the late registration fee of \$5.

For the second term, For those completing their registration on
Monday, August 3..... \$2.00
Tuesday, August 4..... 3.00
Wednesday, August 5.. 4.00

No registrations will be accepted later than Wednesday, August 5, without the special approval of the director and the payment of a fee of \$5.

Candidates for admission to all colleges except Agriculture and Home Economics will secure their registration blanks at the office of the registrar, Minneapolis campus. Candidates for admission to the College of Agriculture and Home Economics will register at the University Farm, 205 Administration Building.

Changes in Registration

Any modification of the prescribed program must be made by petition. This petition, which may be secured at the registrar's office, must be approved by Dean E. E. Nicholson, 239 Chemistry Building.

FEES

The following fees are payable by each full time student at the time of registration and must be paid before registration is complete:

Tuition fee (first or second term of Summer Session)..... \$25.00*
General deposit 2.00

In addition each laboratory course will carry a fee as indicated in the statement of courses.

* This fee of \$25 includes the following in addition to tuition: health fee, Minnesota Union or Shevlin Hall fee, recreation fee, and post-office box rental. For regular students in Medicine and Dentistry, special fees covering these items are charged in addition to tuition.

Charges for lockers, laboratory breakage, library fines, etc., will be deducted from the \$2 deposit and the balance will be refunded by mail after the close of the session.

For fees for students desiring legal time credit in the Medical School, see page 66.

For fees for students registering for clinical courses in the College of Dentistry, see page 81.

For fees for students registering for music courses, see page 39.

For fees for students registering for the eight weeks' course in civil engineering, see page 47.

For part time students in courses for which the full time fee is \$25 registering for four credit hours or less the tuition fee will be reduced to \$15 for either term.

Refund of Fees

Students cancelling during the first week of either term for unavoidable reasons will be granted a four-fifths refund. After twelve o'clock Saturday noon, June 27, no refunds will be granted for the first term. After Saturday noon, August 8, no refunds will be granted for the second term. All refunds must be approved by the director of the Summer Session.

AUDITORS

Permission to attend classes as auditors will be granted only to students who are regularly registered in at least one other summer session class. Fees for auditors are the same as for students registered for credits.

III. GRADUATE WORK

It is possible through work in the Summer Session to fulfill the requirements for the Master's degree and absolve in part the requirements for the degree of doctor of philosophy. Any summer session student who is a graduate of a standard college should register through the Graduate School for his courses in the Summer Session.

This bulletin carries an increased number of courses of advanced character. In general, courses numbered above 100 carry graduate credit. There is sufficient work available each summer to fulfill the course requirement for the major and minor in practically any combination of departments.

Graduate students from acceptable colleges may expect to meet the residence and course requirements for the Master's degree in four summer sessions of six weeks each or three summer quarters. In the former case, additional work on the thesis will be required in order to make up the equivalent of three quarters.

A full statement of the requirements for advanced degrees may be found in the Graduate School bulletin.

Students should bear in mind the necessity of registering each summer in the Graduate School if they desire their work to be counted for an advanced degree.

IV. STATEMENT OF COURSES

The following pages contain announcements of the courses offered in the several colleges and schools of the University. Departmental statements also indicate certain requirements as to entrance and credits. For more detailed statements of these matters, references should be made to the bulletin of general information and the regular annual bulletin of the college concerned.

Any course announced for the Summer Session may be cancelled if the enrolment is not sufficient to warrant its continuance.

Following each course is a statement, in parentheses, of credits, prerequisites, classes of students eligible, class hour, days of the week, and location of the class. Thus (3 cr.; jr., sr., grad.; 3-4; MTWThF II; 117F) means that the course carries three credits, is open to juniors, seniors, and graduate students, demands Course 3-4 in the same department as a prerequisite, meets on Monday, Tuesday, Wednesday, Thursday, and Friday, at the second hour, in Room 117, Folwell Hall. Abbreviations for class hours and buildings are interpreted by the following tables:

CLASS HOUR SCHEDULE

	Minneapolis Campus	University Farm
I Hour	8:00- 8:50	7:45- 8:35
II Hour	9:00- 9:50	8:45- 9:35
III Hour	10:00-10:50	9:45-10:35
IV Hour	11:00-11:50	10:45-11:35
V Hour	12:00-12:50	11:45-12:35
VI Hour	1:00- 1:50	1:00- 1:50
VII Hour	2:00- 2:50	2:00- 2:50
VIII Hour	3:00- 3:50	3:00- 3:50
IX Hour	4:00- 4:50	4:00- 4:50
X Hour	5:00- 5:50	5:00- 5:50

Convocation, III hour, Thursdays

(See *Official Daily Bulletin* for announcements.)

KEY TO ABBREVIATIONS USED FOR BUILDINGS

Minneapolis Campus Buildings

A. Armory	F, Folwell Hall	OL, Old Library
AB, Animal Biology	G, Greenhouse (13th and University avs)	OT, Ore Testing Works
B, School of Business	IA, Institute of Anatomy	P, Pillsbury Hall
BM, U.S. Bureau of Mines Bldg	L, Law Bldg	Ph, Physics Bldg
C, Chemistry Bldg	Lib, New Library Bldg	Phm, Pharmacy Bldg
D, Dentistry Bldg	M, Mines Bldg	Psy, Psychology Bldg
E, Main Engineering Bldg	MA, Mechanic Arts Bldg	SBH, State Board of Health Bldg
Ed, Education Bldg	ME, Mechanical Engineering Bldg	Sh, Shevlin Hall
EE, Electrical Engineering Bldg	MGH, Minneapolis General Hospital	SS, Storehouse and Shops
EMH, Elliot Memorial Hospital	MH, Millard Hall	UD, University Dispensary (Basement MH)
Exp, Experimental Engineering Bldg	Mu, Music Bldg	UH, University Hospital
	O, Observatory	WGM, Women's Gymnasium

University Farm Buildings

Ad, Administration Bldg	Gv, Gymnasium	PP, Botany and Plant Pathology
Ch, Chemistry Bldg	HE, Home Economics Bldg	So, Soils Bldg
DH, Dairy Hall	Ho, Home Bldg	St, Stock Pavilion
En, Engineering Bldg	Hr, Horticulture Bldg	Ve, Veterinary Bldg
FH, Farm House	Pe, Pendergast Hall	WH, Women's Hall

THE COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS

ANIMAL BIOLOGY*

Credit is given for acceptable work done at the Puget Sound Biological Station (under supervision of Mr. Lund) or at any other accredited seaside station.

FIRST TERM

- 1su.¹ General Zoology. A survey of the animal kingdom, emphasizing the principles of morphology, physiology, embryology, heredity, classification, and evolution of animals. Textbook, lectures, quizzes, and laboratory. (5 cr.; all; no prereq.; MTWThF, lect., I, IV; lab.,² II, III; lab., 101, lect., 211AB.) Mr. Ringoen.
- 2su.¹ General Zoology. A continuation of Course 1su. (5 cr.; all; prereq., 1; MTWThF, lect., III, IV; lab., I, II; lab., 101, lect., 201AB.) Mr. Minnich.
- 44su. Animal Parasites and Parasitism. Introductory course dealing with the structure and life histories of representative parasites. (3 cr.; fr., soph.; prereq., General Zoology; MWF VI, VII, VIII, IX; lab. and lect., 212AB.) Mr. Riley, Mr. Philip.
- 120su. Advanced Ecology. An intensive quantitative study of an aquatic environment. (5 cr.; prereq., 117-118-119; ar.; 401AB.) Mr. Chapman.
- 144su. Animal Parasites and Parasitism. Advanced course, stressing methods, sources of material, and the literature of the subject. (3 cr.; jr., sr., grad.; prereq., 15 cr. in zoology; ar.; lab. and lect., 212AB.) Mr. Riley.

SECOND TERM

- 2su.¹ General Zoology. Second half of Course 1su. (5 cr.; prereq., Course 1su or equiv.; MTWThF I, II, III, IV; lab., 101, lect., 211AB.) Mr. Ringoen.

ANTHROPOLOGY

FIRST TERM

- 51su. Introduction to Anthropology. An account of primitive civilization. (3 cr.; jr., sr.; no prereq.; MTWThFS II; 9F.) Mr. Wallis.
- 110su. Physical Anthropology. The physical structure of the races and of prehistoric man. Lines of probable evolution of types. (3 cr.; jr., sr., grad.; no prereq.; MTWThFS I; 12F.) Mr. Wallis.
- 114su. Newer Immigrants. Characteristics, contributions, and distribution of the newer immigrant peoples in America; their modification and importance to us. (3 cr.; jr., sr., grad.; MTWThFS IV; 15F.) Mr. Koenig.

* See also Department of Entomology and Economic Zoology, page 38.

¹ A laboratory fee of \$1.50 is charged for this course.

² Students who find conflicts with this laboratory period, consult the department for possible alternative periods.

(Errata slip)

ASTRONOMY
SECOND TERM

- 11su. Descriptive Astronomy. A course of lectures and recitations on the general principles of astronomy, illustrated with lantern slides and by the use of the telescope. (5 cr.; fr., soph., jr., sr.; no prereq.; MTWFS III-IV; 124F.) Mr. Beal.
- 25su. Stellar Astronomy. Review of present state of knowledge concerning the stars and nebulae. Theories of stellar evolution. (3 cr.; soph., jr., sr.; prereq., 3 cr. in astronomy; MTWThFS II; 124F.) Mr. Beal.

BOTANY

FIRST TERM

- 1su.¹ General Botany. A study of a typical plant followed by an intensive study of the morphology and physiology of the parts of the plant. Textbook, quizzes, laboratory, lectures, and field work. (5 cr.; all; no prereq.; lect., MTWThF III-IV; 10 additional hours for lab., forenoon or afternoon to be arranged with the class; lab., 212, lect., 214P.) Mr. Dopp.
- 2su.¹ General Botany. A survey of the plant kingdom emphasizing the principles of morphology, embryology, classification, and evolution of plants. Textbook, quizzes, lectures, and laboratory. (5 cr.; all; no prereq.; lect. MTWThF I-II; 10 additional hrs. for lab., forenoon or afternoon to be arranged with the class; lab., 212, lect., 214P.) Miss Mygrant.
- 7su. Taxonomy and Classification of the Flowering Plants. A general study of the classification and relationships of flowering plants. Lecture, laboratory, and field work. (3 cr.; no prereq.; MTWThF VI-VII; 214P.) Miss Mygrant.

ENGLISH

COURSES IN ENGLISH

First Term

- 1su. English Survey. Intended for students who have had work in composition equivalent to that of A-B-C, but who have not had the survey of English classics included in that course. This course carries university credit for the first quarter of English 1, 2, 3. (3 cr.; soph., jr., sr.; prereq., 9 cr. in comp.; MTWThFS IV; 303F.) Mr. Creamer, Mr. Frantz.
- 2su. English Survey. A continuation of 1su. This course carries university credit for the second quarter of English 1, 2, 3. (3 cr.; soph., jr., sr.; prereq., 9 cr. in comp; MTWThFS II; 305F.) Mr. Griggs.
- 3su. English Survey. A continuation of 2su. This course carries university credit for the third quarter of English 1, 2, 3. (3 cr.; soph., jr., sr.; prereq., 9 cr. in comp.; MTWThFS I; 311F.) Mr. Richardson.

¹ A laboratory fee of \$1.50 is charged for this course.

- 6su. Chaucer. Reading of tales from the Canterbury collection with introduction dealing with the grammar and literary forms of fourteenth-century English. (3 cr.; soph., jr., sr.; prereq., A-B-C or equiv.;² Sec. 1, MTWThFS I; Sec. 2, MTWThF VII and 1 hr. ar.; 204F.) Sec. 1, Mr. Wedel; Sec. 2, Miss Carr.
- 8su. Shakespeare. Shakespeare's development as a poet and dramatist up to *King Lear*. (3 cr.; soph., jr., sr.; prereq., A-B-C or equiv.;² Sec. 1, MTWThFS II; Sec. 2, MTWThF VI and 1 hr. ar.; 204F.) Sec. 1, Mr. Hessler; Sec. 2, Miss Carr.
- 44su. Early American Literature. Facts and backgrounds of American literature in the seventeenth and eighteenth centuries. This course carries university credit for the first quarter of English 44-45. (3 cr.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS IV; 204F.) Mr. Moore.
- 59su. Nineteenth-Century Prose. The more important prose of the nineteenth century, not including fiction. This course carries university credit for the second quarter of English 58-59. (3 cr.; jr., sr.; prereq., A-B-C or equiv.;² MTWThF VII and 1 hr. ar.; 205F.) Mr. Wedel.
- 66su. English Novel. Development of the English novel from Malory to Scott. (3 cr.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS II; 306F.) Mr. Sutcliffe.
- 70su. Elizabethan Drama. The chief Elizabethan and Jacobean dramatists, excluding Shakespeare. (3 cr.; jr., sr.; prereq., Course 8; MTWThFS I; 205F.) Mr. Hessler.
- 80su. Teachers' Course in English. (See College of Education statement, page 99.)
- 109su. Romantic Poets. This course carries university credit for the first quarter of English 109-110. (3 cr.; jr., st., grad.; prereq., 6 or 8 and one other course numbered above 5; MTWThF VI and 1 hr. ar.; 205F.) Miss Nicolson.
- 136su. Advanced Shakespeare. Shakespeare's development traced to the end. A careful analysis of four plays. Problems in the interpretation of Shakespeare's dramatic methods. (3 cr.; jr., sr., grad.; prereq., grade of B in English 8; MTWThFS II; 205F.) Mr. Ruud.
- 140su. Advanced Chaucer. The more important of Chaucer's poems aside from *The Canterbury Tales*; the sources and chronology of Chaucer's work. (3 cr.; jr., sr., grad.; prereq., 6, and one other course numbered above 5; MTWFS III and 1 hr. ar.; 205F.) Mr. Ruud.
- 159su. Nineteenth-Century Prose. A modification of 59su to suit the needs of graduate students. They will be required to attend the meetings of

² A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

- 59su. and to do such additional work as the instructor may assign. (See schedule under Course 59su.)
- 166su. English Novel. A modification of 66su. to suit the needs of graduate students. They will be required to attend the meetings of 66su. and to do such additional work as the instructor may assign. (See schedule under Course 66su.)
- 170su. Elizabethan Drama. A modification of 70su. to suit the needs of graduate students. They will be required to attend the meetings of 70su. and to do such additional work as the instructor may assign. (See schedule under Course 70su.)

Second Term

- 2su. English Survey. See First Term, Course 2su. (3 cr.; soph., jr., sr.; prereq., 9 cr. in comp.; MTWThFS II; 305F.) Miss Grandy.
- 3su. English Survey. See First Term, Course 3su. (3 cr.; soph., jr., sr.; prereq., 9 cr. in comp.; MTWThFS IV; 303F.) Mr. Griggs.
- 8su. Shakespeare. Shakespeare's development as a poet and dramatist up to *King Lear*. (3 cr.; soph., jr., sr.; prereq., A-B-C or equiv.;² MTWThFS I; 204F.) Mr. Nichols.
- 45su. American Literature. This course carries university credit for the second quarter of English 44-45. (3 cr.; soph., jr., sr.; prereq., A-B-C or equiv.;² MTWThFS IV; 204F.) Mr. Nichols.
- 62su. Milton. (3 cr.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS I; 205F.) Mr. Sutcliffe.
- 67su. English Novel. A continuation of 66su. Development of the English novel from Scott to Conrad. (3 cr.; jr., sr.; prereq., A-B-C or equiv.;² MTWThFS II; 205F.) Mr. Sutcliffe.
- 162su. Milton. A modification of 62su. to suit the needs of graduate students. They will be required to attend the meetings of 62su. and to do such additional work as the instructor may assign. (See schedule under Course 62su.) Mr. Sutcliffe.
- 167su. English Novel. A modification of 67su. to suit the needs of graduate students. They will be required to attend the meetings of 67su. and to do such additional work as the instructor may assign. (See schedule under Course 67su.) Mr. Sutcliffe.

COURSES IN COMPOSITION

First Term

- Asu. Freshman English. The study of the fundamental principles of composition; training in the art of writing; an historical survey of the classics of English literature. This course carries university credit for the first quarter of English A-B-C. (5 cr.; all; no prereq.; MTWThFS IV; MTWThF VII; 303F.) Mr. Creamer, Mr. Frantz.

² A-B-C, as a prerequisite, has for its equivalent any two quarters of English 1-2-3 and 9 credits in composition.

- Bsu. Freshman English. A continuation of Asu. This course carries university credit for the second quarter of English A-B-C. (5 cr.; all; prereq., Eng. A; MTWThFS II; MTWThF VI; 305F.) Mr. Griggs.
- Csu. Freshman English. A continuation of Bsu. This course carries university credit for the third quarter of English A-B-C. (5 cr.; all; prereq., Eng. A, B; MTWThFS I; MTWThF VI; 311F.) Mr. Richardson.
- 4su. Composition for Technical Students. Practical training in the art of writing; the principles of structure, and analysis of specimens of good prose. This course carries university credit for the first quarter of Composition 4-5-6, or of Composition 1-2-3 of preceding years. (3 cr.; all; no prereq.; MTWThF VII; 303F.) Mr. Creamer, Mr. Frantz.
- 5su. Composition for Technical Students. A continuation of 4su. This course carries university credit for the second quarter of Composition 4-5-6. (3 cr.; all; prereq., Comp. 4; MTWThF VI; 305F.) Mr. Griggs.
- 6su. Composition for Technical Students. A continuation of 5su. This course carries university credit for the third quarter of Composition 4-5-6. (3 cr.; all; prereq., Comp. 4, 5; MTWThF VI; 311F.) Mr. Richardson.
- 11su. Description. This course carries university credit for the first quarter of Composition 11-12. (3 cr.; soph., jr., sr.; prereq., English A-B-C or Comp. 4-5-6; MTWThFS IV; 305F.) Miss Nicolson.
- 69su. Short Story-Writing. The technique of the short story accompanied by constructive work in story-writing. (3 cr.; jr., sr.; prereq., Comp. 11-12 or 18-19 and permission of instructor; MTWThFS III and 1 hr. ar.; 306F.) Mr. Sutcliffe.

Second Term

- Bsu. Freshman English. See First Term, Course Bsu. (5 cr.; all; prereq., English A; MTWThFS II; MTWThF VI; 305F.) Miss Grandy.
- Csu. Freshman English. See First Term, Course Csu. (5 cr.; all; prereq., English A, B; MTWThFS; IV, MTWThF VII; 303F.) Mr. Griggs.
- 5su. Composition for Technical Students. See First Term, Course 5su. (3 cr.; all; prereq., Comp. 4; MTWThF VI; 305F.) Miss Grandy.
- 6su. Composition for Technical Students. A continuation of 5su. (3 cr.; all; prereq., Comp. 4, 5; MTWThF VII; 303F.) Mr. Griggs.

COURSES IN PUBLIC SPEAKING

First Term

For description of courses in speech disorders offered by Dr. Smiley Blanton, see bulletin of the College of Education.

Voice and Speech Correction. A special course, open to all students, for the correction of such disorders as wrong placement, faulty resonance, huskiness, indistinctness, and vocal fatigue. All students in public speaking required to attend. (No cr.; all; no prereq.; TTh IX; 308F.) Miss Johnson, Mr. Rarig, Mr. Raines, Mr. Morse.

- 41su. Public Speaking. Effective speaking, breathing, voice production, enunciation, and action; delivery of selections from the works of well-known writers and speakers; principles of speech-making applied in both oral and written compositions. Voice and speech correction. This course carries university credit for the first quarter of Public Speaking 41-42-43. (3 cr.; soph., jr., sr.; prereq., Eng. A-B-C, Comp. 1-2-3 or 4-5-6; Sec. 1, MTWThFS I; Sec. 2, MTWThFS IV; 308F.) Mr. Rarig, Mr. Morse.
- 43su. Public Speaking. A continuation of 42su. This course carries university credit for the third quarter of Public Speaking 41-42-43. (3 cr.; soph., jr., sr.; prereq., Eng. A-B-C, Comp. 1-2-3 or 4-5-6, and 41; MTWThFS IV; 306F.) Mr. Raines.
- 55su. Debate and Argumentation. Short course for teachers. Theory and practice of argumentation. Phrasing debatable propositions; analysis, evidence, reasoning. Practice debating. Problems of coaching. Sources of materials. This course carries university credit for the first quarter of Public Speaking 55-56-57. (3 cr.; jr., sr.; prereq., 41-42-43 or 45-46; MTWThFS II; 308F.) Mr. Morse.
- 70su. Teachers' Problems. Theoretical and practical aspects of the teaching of courses in fundamentals of speech, debate and argumentation, interpretative reading, dramatic production. Class discussions, reports, outlines of courses. (3 cr.; prereq., 41-42-43 or 45-46; MTWThF VII and one hour to be arranged; 308F.) Miss Johnson and others.
- 81su. Interpretative Reading. The interpretation and oral reading of the various forms of literature, such as prose narrative, lyric and narrative poetry, the essay, and the drama. This course carries university credit for the first quarter of Public Speaking 81-82-83. (3 cr.; jr., sr.; prereq., 41-42-43 or 45-46; MTWThF VI and one hour to be arranged; 308F.) Miss Johnson.
- 91su. Play Production. Putting on the school play. Short course for teachers. Examination of plays, casting, coaching, movement, grouping, principles of stage color and of design in costuming and setting; stage management, lighting, mechanics, make-up. This course carries university credit for the first quarter of Public Speaking 91-92-93. (3 cr.; jr., sr.; prereq., Eng. 8, Pub. Sp. 81-82-83; MTWThF VII and one hour to be arranged; 19Mu.) Mr. Raines.

Second Term

- 41su. Public Speaking. Effective speaking, breathing, voice production, enunciation, and action, delivery of selections from the works of well-known writers and speakers, principles of speech-making applied in both oral and written compositions. Voice and speech correction. This course carries university credit for the first quarter of Public Speaking 41-42-43. (3 cr.; soph., jr., sr.; prereq., Eng. A-B-C, Comp. 1-2-3 or 4-5-6; MTWThFS I; 308F.) Mr. Morse.

- 42su. Public Speaking. A continuation of 41su. This course carries university credit for the second quarter of Public Speaking 41-42-43. (3 cr.; soph., jr., sr.; prereq., Eng. A-B-C, Comp. 1-2-3 or 4-5-6, and 41; MTWThFS II; 308F.) Mr. Morse.

GEOGRAPHY

FIRST TERM

- 51su. Human Geography. A study of the factors of the physical environment and their effect on human activities. (3 cr.; soph., jr., sr.; no prereq.; MTWThF I; 2F.) Mr. Davis and assistant.
- 61su. Geography of Commercial Production. The principal commodities of world trade, with reference to areas of origin and consumption and the geographic elements in their production. (3 cr.; soph., jr., sr.; no prereq.; MTWThF II; 2F.) Mr. Davis and assistant.

GEOLOGY

FIRST TERM

- 1su. General Geology. An introductory study of the earth materials together with the processes and events that have marked the earth's development. Lectures, laboratory work, and field excursions. (5 cr.; not limited; no prereq.; TWThFS I-II; 110P.) Mr. Stauffer.

GERMAN

FIRST TERM

- 1su. Beginning A. Pronunciation, conversation, grammar, and composition; selected readings in easy prose and verse. (5 cr.; no prereq.; MTWThF I-II; 209F.) Mr. Schlenker.
- 3su. Beginning C. Selected texts from modern writers. (5 cr.; prereq., 2, or 2 years preparatory German; MTWThF VII-VIII; 209½F.) Mr. Prottengeier.
- 4su. Rapid Reading. Modern narrative prose. (5 cr.; prereq., 3 or equiv.; MTWThF I-II; 207F.) Mr. Burkhard.
- 64su. Classic Drama. Plays of Lessing, Goethe, and Schiller. (3 cr.; prereq., Course 4 or equiv.; MWF III-IV; 209F.) Mr. Prottengeier.
- 150su. Die Novelle. A study of the technique and development. Assigned readings and reports. (3 cr.; prereq., 14 senior college credits in German courses or equivalent; hours and days ar.)
- 225su. Literary Problems. This course is intended primarily for graduate students. Subject: Goethe's *Faust*. (Hours and days ar.) Mr. Schlenker.

GREEK

FIRST TERM

- 17su. Greek Sources of English (Everyday Greek). A brief course in Greek sources of English words. The practical purpose is to enable students to trace the origin and feel the force of English words derived from Greek, and especially of scientific terms. (2 cr.; all; prereq., 1 yr. of any foreign language; MTWTh I; 113F.) Miss Strong.

Courses for Which No Knowledge of Greek Is Required

- 42su. Greek Sculpture. Development of Greek sculpture from its beginnings will be traced; famous statues, friezes, reliefs, and monuments will be shown and described; personalities of the great sculptors and their special contributions to art will be considered. (2 cr.; all; no prereq.; MTWTh II; 114F.) Mr. Savage.
- 44su. Greek Literature and Life. Lectures, textbook work, illustrative and assigned readings. The character and influence of Greek culture, especially in literature, philosophy, and art, will be discussed; the whole course will be richly illustrated with the stereopticon. (2 cr.; all; no prereq.; MTWF III; 114F.) Mr. Savage.
- 45su. Greek Mythology. Lectures, readings, and textbook work dealing with the legends which appear in the literature and art of ancient Greece; stereopticon illustrations. The myth will be presented and interpreted; its origin, evolution, and influence will be discussed. (2 cr.; all; no prereq.; MTWTh IV; 114F.) Mr. Savage.

HISTORY
FIRST TERM

- 2su. Modern World, 1795-1870. A survey of the leading political, social, and economic phases of this period, stressing those which were most influential in producing the modern world. (5 cr.; fr., soph., jr., sr.; no prereq.; MTWThF VI-VII; 112OL.) Mr. Andrews and assistant.
- 7su. United States, 1776-1844. A survey of the various factors of the history of the United States for the first part of the national period. (5 cr.; soph., jr., sr.; no prereq.; MTWThF IV-V; 221OL.) Mr. Hicks and assistant.
- 15su. Recent United States. A general survey of the period since 1877. (3 cr.; soph., jr., sr.; no prereq.; MTWThFS II; 221OL.) Mr. Hicks.
- 19su. Political History of Rome. Political development of the Roman Republic and the early Empire. (3 cr.; soph., jr., sr.; no prereq.; MTWThFS I; 109F.) Mr. Cram.
- 63su. Survey of Minnesota History. The settlement and development—social, political, and economic—of a typical American commonwealth. (3 cr.; soph., jr., sr.; prereq., 10 cr.; MTWThFS I; 221OL.) Mr. Blegen.
- 108su. Europe, 1870 to 1914. A study of the background of the War of 1914. Reading knowledge of French and German is desirable. (3 cr.; jr., sr., grad.; prereq., 15 cr. incl. 1-2 or 2-3; MTWThFS IV; 111OL.) Mr. Steefel.
- 110su. Modern England. The development of England since 1815: a survey of the outstanding factors. (3 cr.; jr., sr., grad.; prereq., 20 cr. in social sciences or 15 cr. in history; MTWThFS II; 112OL.) Mr. Andrews.

- 120su. Medieval Civilization. A study of the social and intellectual development of Europe from the period of the German migrations to the end of the thirteenth century. (3 cr.; jr., sr., grad.; prereq., 15 cr.; MTWThFS IV; 112OL.) Mr. Krey.
- 158su. Topics in European History. Introduction to bibliography and sources for study of international relations. Intensive study of selected period. (3 cr.; sr., grad.; prereq., 20 cr. in history including 2-3 and an advanced course in European history, reading knowledge of French or German; two two-hour periods per week to be arranged.) Mr. Steefel.
- 175su. Topics in Medieval Civilization. (3 cr.; sr., grad.; prereq., 20 cr. in history including 120, knowledge of at least high school Latin; two two-hour periods per week to be arranged.) Mr. Krey.

SECOND TERM

- 20su. American Colonial History, 1492-1775. A general survey of the period of discovery, exploration, and settlement. (3 cr.; soph., jr., sr.; no prereq.; MTWThFS II; 221OL.) Mr. Bemis.
- 35su. Introduction to Economic History. Outline of economic development with regard to the evolution of economic organization and the changes in agriculture, manufacture, transportation, and exchange. (3 cr.; soph., jr., sr.; prereq., 10 cr. in social sciences; MTWThFS I; 111OL.) Miss Hartsough.
- 113su. History of American Immigration. European background and causes of immigration; European stocks in the new world. (3 cr.; jr., sr., grad.; prereq., 15 cr.; MTWThFS II; 112OL.) Mr. Stephenson.
- 115su. American Economic History. Development of agriculture, manufacture, commerce, and transportation with some attention to the problems of tariff, capitalism, and labor. (3 cr.; jr., sr., grad.; prereq., 15 cr.; MTWThFS IV; 111OL.) Miss Hartsough.
- 125su. Foundations of American Foreign Policy, 1775-1823. The evolution of foreign policy from the beginning of the Revolution to the formulation of the Monroe Doctrine. (3 cr.; jr., sr., grad.; prereq., 15 cr. in history or political science; MTWThFS IV; 221OL.) Mr. Bemis.
- 143su. American Political Parties. Rise and development of parties and the party system, with some attention to the more important presidential campaigns. (3 cr.; jr., sr., grad.; prereq., 20 cr. in social sciences including general course in American history; MTWThFS I; 112OL.) Mr. Stephenson.

LATIN

FIRST TERM

- 19su. Political History of Rome. A political history of Rome to the time of Marcus Aurelius. (3 cr.; soph., jr., sr., grad.; no prereq.; MTWThFS I; 109F.) Mr. Cram.
- 144su. Roman Poetry. Translation and study of selections of Latin poetry from Ennius to Boethius. (3 cr.; jr., sr., grad.; prereq., any two of Courses 51, 52, 53 or six years of Latin (with credit). Without credit consult instructor; MTWThFS II; 109F.) Mr. Cram.

MATHEMATICS

FIRST TERM

- 1su. Higher Algebra. A review and a collegiate treatment of the topics of elementary algebra for those who have had one year of elementary algebra. Not open to those who presented higher algebra for entrance. (5 cr.; all; prereq., 1 yr. elementary algebra; MTWThF VI-VII; 105F.) Mr. McEwen.
- 6su. Trigonometry. Logarithms and plane trigonometry. (5 cr.; all; prereq., 1 or prep. higher algebra; MTWThF I-II; 104F.) Miss Carlson, Mr. McEwen.
- 7su. College Algebra. Quadratic equations, equations in the quadratic form, simultaneous quadratic equations, graphical representation, progressions, mathematical induction, the binomial theorem, permutations, combinations, probability, determinants, and the theory of equations with special reference to graphical methods. (5 cr.; all; prereq., 1 or prep. higher algebra; MTWFS III; MTWThF IV; 101F.) Mr. Jackson, Mr. Grossnickle.
- 30su. Analytical Geometry. Given in the College of Engineering. See page 50.
- 50su. Calculus I. Differential calculus. (5 cr.; jr., sr.; prereq., 30; MTWThF I-II; 105F.) Mr. Underhill.
- 51su. Calculus II. Integral calculus. Given in the College of Engineering. See page 50.
- 165su. *Selected Topics in Advanced Mathematics. An intensive course open to juniors, seniors, and graduates, who will be guided through conferences and criticism in the study of assigned topics. (Cr. ar.; jr., sr., grad.; prereq., 50, 51, differential and integral calculus; ar.*) Mr. Jackson, Mr. Underhill, Miss Carlson.

SECOND TERM

- 6su. Trigonometry. Logarithms and plane trigonometry. (5 cr.; all; prereq., 1 or prep. higher algebra; MTWThF III, IV; 104F.) Mr. Grossnickle.
- 30su. Analytic Geometry Given in the College of Engineering. See page 50.
- 51su. Calculus II. Integral calculus. (5 cr.; jr., sr.; prereq., 50; MTWThF I, II; 105F.) Mr. Hart, Mr. Grossnickle.
- 165su.* Selected Topics in Advanced Mathematics. (Cr. ar.; jr., sr., grad.; prereq., 50, 51; ar.*) Mr. Hart.

* The number of credits is 3 or more according to the amount of work done. The following topics, each for at least three credits, will be given in 1925. Students interested in one or more of them should reserve the hour indicated: Fourier Series and Other Special Series, by Mr. Jackson (II hour), Differential Equations, by Mr. Underhill (I hour), Advanced Geometry, by Miss Carlson (III hour).

MUSIC

FEES

The courses below, for which no special fee is indicated, may be taken by summer session students on payment of the regular summer session fee. Students who pay as much as \$36 per term for special music fees may enroll for other courses in any department of the Summer Session, for an additional fee of \$14 per term, making a total of \$50 for general and special fees. All students who register for either the general courses or the special fee courses must pay the \$2 deposit.

FIRST TERM

- 1su. Harmony. The study of chords, their construction, relations, and progressions. Written exercises on bases, the harmonization of given melodies. (3 cr.; no prereq.; MWF VI-VII; 103Mu.) Mr. Ferguson.
- 3su. Harmony. A continuation of Harmony 1su, which offers the work of the third quarter of the regular year. (3 cr.; prereq., 1-2; MWF III-IV; 103Mu.) Mr. Ferguson.
- 13su.¹ Class Instrument-Teaching. Three classes, string, wood winds, and brass and percussion. Students may enter any or all classes. The course will contain drills, methods, and material for use in class instrument-teaching in the public schools. (1 to 3 cr. each; TS; strings, II; wood winds, III; brass, IV; 3Mu.) Mr. Pepinsky.
- 39su. Piano. Open to those who have mastered technical difficulties of the degree of Czerny's *School of Velocity* and the easier Haydn and Mozart sonatas. Two lessons a week. Fee \$36. (2 cr.; ar.; Mu.) Mr. Lindsay, Miss Kendall, Miss Reeves.
- 42su. Orchestra. Laboratory for the study of orchestral literature, symphonic and miscellaneous. Orchestra will assist in campus functions and enter with the student body in the maintenance of a true campus spirit. Applicants will bring their own instruments. (1 cr.; M IX, X; Mu. Aud.) Mr. Pepinsky.
- 45su. Chorus. Choral singing. Open to all university students. (1 cr.; TTh IX; Mu.) Mr. Killeen.
- 51su. Violin. Open to students who are qualified to play the first ten of Kreutzer's *Forty Etudes*, and the easier Handel and Mozart sonatas. Two lessons a week. Fee \$36. (2 cr.; ar.; Mu.) Mr. Scheurer.
- 63su. Voice. Thoro training in relaxation and breath control, the foundation of tone production. Advantages offered to advanced singers in study of the best in vocal literature, songs, oratorio, and opera. Two lessons a week. Fee \$36. (2 cr.; ar.; Mu.) Mr. Killeen, Miss Hull.
- 75su. Public School Music for the Grades. Grade methods. (3 cr.; MWF I-II.) Mr. Glenn Woods.
- 78su. Public School Music for High Schools. (3 cr.; prereq., 75; MWF III-IV; Mu.) Mr. Glenn Woods.

¹ The three subjects may be taken concurrently.

- 93su. Normal Course for Teaching of Voice. A lecture course in which principles of teaching, breathing, voice-placing, and development of vocal technique are discussed. (2 cr.; TTh VII-VIII; Mu.) Mr. Killeen.
- 94su. Sight Reading, Accompanying, and Ensemble Playing. Study of chamber music literature, for various combinations of instruments. Simple sonata literature used for sight reading and accompanying, after which the more serious ensemble literature will be reviewed. (2 cr.; TTh VI, VII; 3Mu.) Mr. Pepinsky.
- 100su. Organ. Open to students who play piano music of an intermediate grade. Two lessons a week. Fee \$36. (2 cr.; ar.; Mu.) Mr. Fairclough.

SECOND TERM

Piano, voice, violin, and organ, if registration warrants.

PHILOSOPHY

FIRST TERM

- 3su. Ethics. The principles of morals; sketch of the historical development of morality followed by an analysis of its meaning, and of its basis in human nature. (3 cr.; soph., jr., sr.; no prereq.; MTWThFS III; 322F.) Mr. Wilde.
- 129su. Modern Political Thought. The state in modern political philosophy; its nature, basis, and authority. Individualism and socialism in the eighteenth and nineteenth centuries. (3 cr.; jr., sr., grad.; prereq., 20 cr. in social sciences or 10 cr. in philosophy; MTWThFS IV; 322F.) Mr. Wilde.

SECOND TERM

- 1su. Problems of Philosophy. An introductory survey of the chief problems of philosophy, together with some of the more prominent solutions which have been proposed. (3 cr.; soph., jr., sr.; no prereq.; MTWThFS III; 322F.) Mr. Conger.
- 110su. Present Day Philosophy. An examination of the principal doctrines of contemporary philosophers, with special attention to idealism, pragmatism, realism, and naturalism. (3 cr.; jr., sr., grad.; prereq., 10 cr. in philosophy; MTWThFS IV; 322F.) Mr. Conger.

PHYSICS

FIRST TERM

- 1su. Elements of Mechanics. Mechanics of solids, liquids, and wave motion. Study of the simple fundamental principles. The first part of the General Course 1, 2I, 3I, 4I. Course 2 should be taken in conjunction with this course. Part of the required work in physics in the pre-medical and engineering courses. (3 cr.; prereq., trig. the equiv. of 6; lect., MWF I, II; quiz, S I; 30Ph.) Mr. Tate.

- 2su.¹ Mechanics Laboratory Practice. Measurements in the mechanics of solids, liquids, and wave motion. The laboratory part supplementing Course 1.) (1 cr.; prereq., 1 or reg. in 1; lab., TTh I, II; 16Ph.) Mr. Tate.
- 21su. Heat. A study of the principles underlying heat phenomena. Course 22 should be taken in conjunction with this course. This course is a part of the required work in physics in the pre-medical and engineering courses. (3 cr.; prereq., 1; lect., TThS I, II; quiz, M I; 30Ph.) Mr. Miller.
- 22su.¹ Heat Laboratory. The laboratory part supplementing Course 21. Two two-hour sessions in the laboratory a week. (1 cr.; lab., WF I, II; 23Ph.) Mr. Miller.
- 110su. Thesis. (No cr.; ar.) Mr. Erikson, Mr. Tate, Mr. Miller.
- 125su. Atomic Structure. The Bohr-Somerfeld theory of atomic structure and its application to a study of X-rays, radio-activity, resonance, and ionization potentials; photo-electricity; spectrum series and fine structure. Three two-hour lectures a week. (3 cr.; prereq., 12 cr. in phys., Math. 51; MWF VI-VII; 16Ph.) Mr. Tate.
- 144su. Pyrometry and Heat. An experimental study of pyrometry, heat quantity, heat transfer, hygrometry, and gas liquefaction. One lecture, two three-hour sessions in the laboratory a week. (3 cr.; prereq., 12 cr. in phys.; MWF VI-IX; 23Ph.) Mr. Miller.
- 145su.¹ Radioactivity and X-Rays. The various theories and methods of investigation. (3 cr.; prereq., 12 cr. in phys.; ar.) Mr. Erikson.
- 146su. Conduction through Gases. An experimental course devoted to ionization and mobility measurements. (3 cr.; prereq., 12 cr. in phys.; MWF VI-IX.) Mr. Erikson.

SECOND TERM

- 41su. Magnetism and Electricity. A study of the principles underlying magnetic and electrical phenomena. Course 42 should be taken in conjunction with this course. This course is a part of the required work in physics in the pre-medical and engineering courses. (3 cr.; prereq., 1; lect., MWF I, II; quiz, S I; 30Ph.) Mr. Zeleny.
- 42su.¹ Electrical Laboratory. The laboratory part supplementing Course 41. Two two-hour sessions in laboratory a week. (1 cr.; prereq., 1, 41, or reg. in 41; lab., TTh, I-II; 32Ph.) Mr. Zeleny.
- 111su. Thesis. (No cr.; ar.) Mr. Zeleny.
- 142su.¹ Advanced Electrical Measurements. Devoted mainly to the study of potentiometer methods, capacity, inductance, resistance, magnetic flux. (3 cr.; prereq., 12 cr. in phys.; MWF VI-IX; 32Ph.) Mr. Zeleny.

¹ A laboratory fee of \$1.50 is charged for this course.

POLITICAL SCIENCE

FIRST TERM

- 1su. American Government. Origin and nature of the American governmental system; organization and actual workings of the national government today. (4 cr.; no prereq.; lect., TWThF I and T II; quiz sections, WThF II; 211OL.) Mr. J. S. Young.
- 2su. State Government. A comparative study of American state governments. The adoption and amendment of constitutions; organization, powers, and methods of the three departments; problems of administrative organization. (4 cr.; prereq., 1 or reg. in 1; TWThF VI-VII; 211OL.) Mr. C. W. Young.
- 11su. Municipal Government. The growth of cities; their legal status; municipal organization in the United States including the mayor and council commission and city manager plans; municipal organization abroad. (4 cr.; prereq., 1 or 2; TWThF III-IV; 209OL.) Mr. Anderson.
- 15su. Introduction to Political Science. Introductory presentation of the problem of government. The nature of the state, the forms and functions of government, the principles of politics. (4 cr.; prereq., 1 or 2; TWThF I-II; 111OL.) Mr. Kumm.
- 115su. Municipal Corporations. The legal basis of municipal government; the relation of the city to the state; home rule. The city as a legal entity; its powers, duties, and liability for torts. (2 cred.; prereq., Course 11 or 20 cr. in social sciences; TWThF I; 209OL.) Mr. Anderson.
- 141su. Problems in State Government and Constitutional Law. A selected group of current problems in state government will be studied intensively in their constitutional and political aspects. (2 cr.; prereq., 15 cr. in social sciences; TWThF VI; 209OL.) Mr. Kumm.
- 158su. Government and Business. Governmental powers; restraint of trade and manipulation of prices; protection of debtors; business affected with a public interest; combinations of laborers; corporations; compulsory benefits; conservation of natural wealth; vested rights; confiscatory legislation. (2 cr.; prereq., 20 cr. in social sciences; TWThF IV; 211OL.) Mr. J. S. Young.
- 181su. Modern Political Thought. See Philosophy 129su. Jurisprudence. See Law School program.

SECOND TERM

- 1su. American Government. See description above. (4 cr.; no prereq.; TWThF III-IV; 211OL.) Mr. J. S. Young.
- 2su. State Government. See description above. (4 cr.; prereq., 1 or reg. in 1; TWThF I-II; 209OL.) Mr. Lambie.
- 51su. Business Law. Principles governing ordinary business transactions. (2 cr.; prereq., 1 or consent of instructor; TWThF I; 211OL.) Mr. J. S. Young.

125su. American Diplomacy. See History program.

131su. Public Administration. Source of administrative power; administrative areas; organization of departments; personnel, and related civil service problems including classification, training, appointment, promotion, salary determination, the budget; public service as a career. (2 cr.; prereq., 20 cr. in social sciences; TWThF IV; 209OL.) Mr. Lambie.

PSYCHOLOGY

FIRST TERM

1su,2su. General Psychology. The fundamental facts and laws of mental life with emphasis upon the results of experimental methods of investigation. Lectures, recitations, and demonstrations. (6 cr.; soph., jr., sr.; no prereq.; lect., MTWThFS V; MuAud; Sec. 1, MTWThF I; 115Psy; Sec. 2, MTWThF II; 115Psy; Sec. 3, MTWThF III; 115Psy; Sec. 4, MTWThF VI; 115Psy; Sec. 5, MTWThF VII; 115Psy.) Mr. Foster, Mr. Bird, Miss Heidbreder.

107su. Vocational and Employment Psychology. Psychology of individual differences in intelligence, aptitudes, interests, and training with special reference to vocational guidance and personnel methods in education and industry. (3 cr.; soph., jr., sr., grad.; prereq., elementary psychology; MTWThFS I; 109Psy.) Mr. Paterson.

111su. Research Problems in Applied Psychology. Permission of the instructor to elect this course must be secured. (2 cr.; permission of instructor required; prereq., advanced preparation; ar.; ar.) Mr. Paterson.

131su. Research Problems in General or Experimental Psychology. For students qualified for research work in experimental problems in general psychology through intensive work in the literature of the subject. Students will be guided through conferences, the hours to be arranged. (2 cr.; permission of instructor required; prereq., advanced preparation; ar.; ar.) Mr. Foster.

SECOND TERM

1su,2su. General Psychology. (See 1su, 2su above.) (5 cr.; soph., jr., sr.; no prereq.; lect., MTWThFS V; 115 Psy; Sec. 1, MTWThF I; 115Psy; Sec. 2, MTWThF III; 115Psy; Sec. 3, MTWThF VI; 115Psy.) Mr. Bird, Mr. Kluever.

ROMANCE LANGUAGES

COURSES IN FRENCH

First Term

1su. Beginning Course. Pronunciation, grammar, reading, conversation, and composition. (4 cr.; no prereq.; TWThF III-IV; 227F.) Mr. Le Compte.

- 3su. Intermediate Course. Reading of representative modern authors; review grammar, composition. Equivalent either to Fr. 3 or to Fr. 4. (4 cr.; prereq., 1-2; TWThF I-II; 227F.) Mr. Barton, Mr. Sirich.
- 20su. Oral and Written French. Conversation and composition. (2 cr.; prereq., 1, 2, 4; TWThF V; 227F.) Mr. Sirich.
- 103su. French Syntax and Composition. Discussion of characteristic problems of French syntax. Designed especially for teachers. (2 cr.; prereq., 59-60-61; TWThF II; 226F.) Mr. Barton.
- 124su. Voltaire. Lectures, readings, discussion. (2 cr.; prereq., 21-22-23; TWThF IV; 226F.) Mr. Sirich.
- 158su. Contemporary French Drama. The théâtre libre and after; Hervieu, Brioux, Donnay, Curel. Lectures, readings, discussion. (2 cr.; prereq., 21-22-23; TWThF III; 226F.) Mr. Barton.
- 165su. French Romanticism: the Romantic Poets. Lectures, readings, discussions. (2 cr.; prereq., 21-22-23; TWThF I; 226F.) Mr. Le Compte.

COURSES IN SPANISH

First Term

- 1su. Beginning Course. Pronunciation, grammar, reading, conversation, composition. (5 cr.; no prereq.; TWThF III-IV; 201F.) Mr. King.

SCANDINAVIAN

FIRST TERM

- 7su. Beginning Swedish. Grammar, composition, select readings in easy prose and poetry. (5 cr.; no prereq.; MTWThF I-II; 206F.) Mr. Stomberg.
- 45su. Scandinavian Mythology. Lectures, textbook, and collateral reading from the sagas. (3 cr.; jr., sr., grad.; no prereq.; knowledge of the Scandinavian languages not required; MTWThFS IV; 206F.) Mr. Stomberg.
- 107su. Modern Swedish Literature. A study of Swedish novels, principally Fredrika Bremer and Selma Lagerlöf. (3 cr.; jr., sr., grad.; prereq., 10-11 or equivalent; ar.; 206F.) Mr. Stomberg.

SOCIOLOGY

FIRST TERM

- 1su. Introduction to Sociology. A study of the origin and development of human society; various agencies which have determined the type of social life; social organization, institutions, and progress; bearings of sociology upon other social sciences and arts. (3 cr.; no prereq.; Sec. 1, MTWThFS I; 9F; Sec. 2, MTWThFS I; 3F.) Mr. Phelps, Mr. Mehus.
- 6su. Modern Social Reform Movements. A survey of attempts to overcome certain social maladjustments; child labor, the city, bad housing, poverty, degeneracy, movements for public health, industrial democracy, social insurance, protection in infancy and youth, public recreation, etc. (3 cr.; prereq., Soc. 1; MTWThFS IV; 5F.) Mr. Markey.

- 14su. Rural Sociology. The background and evolution of country life; rural conveniences, communications, co-operation; rural social institutions, especially the family, school, church, and social center; rural leadership, surveys, organization, social agencies. (3 cr.; prereq., Soc. 1; MTWThFS II; 5F.) Mr. Hoffer.
- 52su. Elementary Social Case Work. The methods of case work as applied to the treatment of the socially inadequate. (3 cr.; prereq., Soc. 51; MTWThFS I; 6F.) Miss Wheeler.
- 53su. Elements of Criminology. The development of the general concept of crime and criminals; historical methods of dealing with criminals; the types of criminals, causes of crime; social control of crime; treatment of the criminal; agencies for the prevention of crime. (3 cr.; prereq., 10 cr. in sociology or Sociology 1 and 10 credits in social sciences or psychology; MTWThFS IV; 9F.) Mr. Sorokin.
- 60su. Child Welfare. Study of social obligations to the child; development of the child-saving movement in the United States; infant and child mortality, recreation, education; courts, institutions, societies, and other public efforts for the child. (3 cr.; jr., sr.; prereq., 51 and 52; MTWThFS I; 5F.) Miss Keating.
- 90su. Elementary Field Work. Designed to give first-hand knowledge of the conditions out of which dependency develops by field work with a social service agency. (2 cr.; prereq., 51.) Mrs. Rempel.
- 91su. Elementary Field Work. Designed for students who have taken 90 and aiming to give practice in the methods of treatment outlined in Course 52. (2 cred.; prereq., 51 and 90.) Mrs. Rempel.
- 92su. Elementary Field Work. Field work on special research problems, principally in the field of child welfare, depending upon the proficiency attained in 90 and 91. (2 cred.; prereq., 51, 90, 91.) Mrs. Rempel.
- 100su. Social Psychology. The social attitudes; their development and modification under social pressures; the interactions of individuals and groups. (3 cr.; jr., sr., grad.; prereq., Soc. 1, Psy. 1-2, and 11 cred. in soc. sci., educ., phil., and psych.; MTWThFS II; 6F.) Mr. Chapin.
- 101su. Social Organization. The organization and structure of social groups; the selection of group types and values; the disorganization and reorganization of institutions; purposive social organization. (3 cr.; jr., sr., grad.; prereq., 4 courses in soc., or Soc. 1 and 15 cr. in soc. sci., educ., phil., or psych.; MTWThFS I; 110F.) Mr. Sorokin.
- 200su. Graduate Seminar in Sociology. Research on special problems. Open only to graduates on approval of instructors. Offers an opportunity for investigation of special problems under supervision. Credit will be assigned according to the amount and quality of work done. (Grad.; ar.) Mr. Chapin, Mr. Sorokin.

SECOND TERM

- 1su. Introduction to Sociology. A study of the origin and development of human societies; various agencies which have determined the type of social life; social organizations, institutions, and progress, bearing of

- sociology upon other social sciences and arts. (3 cr.; no prereq.; MTWThFS I; 9F.) Mr. Finney.
- 6su. Modern Social Reform Movements. (3 cr.; prereq., 1; MTWThFS II; 9F.) Mr. Clarke.
- 14su. Rural Sociology. (3 cr.; prereq., 1; MTWThFS III; 9F.) Mr. Hoffer.
- 102su. Social Control. Nature, purpose, and methods of social control; institutional and non-institutional controls; the evolution of sanctions in social control; the revision of the social controls under the influence of modern science. (3 cr.; jr., sr., grad.; prereq., same as for 101; MTWThFS I; 5F.) Mr. Sorokin.
- 103su. Sociology of Conflict. An appraisal of competition, combat and cooperation, causes, manifestations, results and cures of conflict between nations, races, religions, and economic and social classes. (3 cr.; jr., sr., grad.; prereq., same as for 101; MTWThFS III; 5F.) Mr. Clarke.
- 158su. The Sociology of Revolution, with special reference to the Russian situation. (3 cr.; jr., sr., grad.; prereq., 1 course in soc.; MTWThFS II; 5F.) Mr. Sorokin.
- 200su. Graduate Seminar in Sociology. Same as first session. Mr. Sorokin Mr. Finney, Mr. Clarke.

PHYSICAL EDUCATION AND ATHLETICS

(For Men and Women)

For an account of the general recreational facilities in physical education, as well as for the description of courses see College of Education section, pages 95 to 98.

COLLEGE OF ENGINEERING AND ARCHITECTURE

ARCHITECTURE

FIRST TERM

- 32su. Elements of Architecture. Original problems in the architectural treatment of walls, floors, windows, and moldings. Lectures and library research. (3 cr.; fr. arch.; prereq., 31; MTWThF I, IV; 317E.) Mr. Heath.
- 33su. Elements of Architecture. Study of the elements, forms, and principles of architecture. Original problems in their use in elementary architectural design. Lectures and library research. (5 cr.; fr. arch.; prereq., 32; MTWThF I, IV; 317E.) Mr. Heath.
- 36su. Architectural Design, Grade I. Long and short problems done under individual criticism dealing in general with the elements of plan and elevation. Sketch problems dealing with the simple compositions. Summer credit limited to two credit hours. (2 cr.; prereq., Arch. 33; MTWThFS I-IV; 317E.) Mr. Heath.

CIVIL ENGINEERING

STRUCTURAL ENGINEERING

First Term

- 31su. Stresses in Structures. Algebraic and graphic analysis of various types of roof and bridge trusses for fixed loading. (3 cr.; jr. C.E.; prereq., M.&M. 26, Draw. 23; ar.; 229E.) Mr. Lagaard.
- 32su. Stresses in Structures. Moving loads and influence lines. Standard engine loadings and equivalent uniform loads. (3 cr.; jr. C.E.; prereq., C.E. 31; ar.; 229E.) Mr. Lagaard.
- 33su. Elementary Structural Design. Designing principles and methods. Complete design and detail drawing of framed mill building bent. (3 cr.; jr. C.E.; prereq., M.&M. 128, C.E. 32; ar.; 229E.) Mr. Lagaard.
- 131su.¹ Bridge Analysis. Stresses in simple span railway bridge trusses of the larger type. Baltimore, Petit, Whipple, and "K" trusses. Eight weeks. (3 cr.; sr. C.E.; prereq., C.E. 33; ar.; 227E.) Mr. Parcel.
- 132su.¹ Bridge Design. Design and detail drawing of railway plate girder viaduct. Eight weeks. (3 cr.; sr. C.E.; prereq., C.E. 131; ar.; 227E.) Mr. Parcel.
- 141u.¹ Reinforced Concrete. Principle of reinforced concrete. Theory of beams, slabs, and columns and the application to ordinary structures. Eight weeks. (3 cr.; sr. C.E.; prereq., M.M. 128; ar.; 227E.) Mr. Parcel.

¹ Eight weeks, June 22 to August 15, 1925. The registration fee for the eight weeks required for these courses is \$30. In addition the student will make the usual deposit of \$5.

DRAWING AND DESCRIPTIVE GEOMETRY

FIRST TERM

- 1su. *Engineering Drawing.* The elements of drafting including an introductory course in the methods of representation and constructive geometry. Graphs and formulas. Sketching, lettering, working drawings, conventions, standards, tracing, and blue printing. (3 cr.; all; prereq., solid geom.; 2 lect., 16 hrs. lab.; ar.; 101E.) Mr. Schuck.
- 2su. *Engineering Drawing.* A continuation of Course 1. (3 cr.; all; prereq., Dr. 1; 2 lect., 16 hrs. lab.; ar.; 101E.) Mr. Schuck.
- 3su. *Descriptive Geometry.* An elementary course in the methods of representation, correlated in part with analytical geometry. Graphical and algebraic solutions. Lectures, demonstrations, and drawing room exercises. (3 cr.; Dr. 2, Math. 12; lect., TWThF I; lab., 14 hrs. ar.; 101E.) Mr. Eggers.
- 4-5-6su. *Engineering Drawing and Descriptive Geometry.* The elements of drafting. Descriptive geometry including graphical methods of representation, correlated in part with analytical geometry. Required of freshmen in the course in chemical engineering who satisfy the entrance requirements in mathematics. (2 cr. each; prereq., sol. geom.; ar.; 201E.) Mr. Schuck.
- 10su. *Solid Geometry.* Lines and planes in space; dihedral and polyhedral angles; polyhedrons, cylinders, cones, similarity, prismoid formula, sphere area, volumes, numerical exercises in area, weights. Entrance credit for the College of Engineering and Architecture. (3 cr.; all; prereq., pl. geom.; MTWThF I; 104E.) Mr. Potter.
- 21su. *Drafting. (C.E.)* Drawing of structures and machines. Details, assembly, and construction drawings. The solution of problems of simple structures. The application of descriptive geometry to drafting room problems. (2 cr.; soph. C.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. French.
- 22su. *Drafting. (C.E.)* Continuation of Course 21. Drafting problems in concrete, highway, and topographical work as met by the civil engineering draftsman in practice. Intersections, developments, and other practical geometric problems. (2 cr.; soph. C.E.; prereq., Dr. 21; 12 hrs.; ar.; 201E.) Mr. French.
- 23su. *Drafting. (C.E.)* A continuation of Course 22. (2 cr.; soph. C.E.; prereq., Dr. 22; 12 hrs. ar.; 201E.) Mr. French.
- 26su. *Drafting. (E.E.)* The application of descriptive geometry to drafting room problems, sheet metal work, belting, conveyors, and connections. Working drawings and tracing. (2 cr.; soph. E.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. French.
- 27su. *Drafting. (E.E.)* The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, electrical conventions, circuit diagrams, the development of simple formulas, and graphical methods. (2 cr.; soph. E.E.; prereq., Dr. 26; 12 hrs. ar.; 201E.) Mr. French.

- 28su. Drafting. (M.E.) The application of descriptive geometry to drafting room problems. Sheet metal work, belting, conveyors, and connections. Working drawings and tracing. (2 cr.; soph. M.E.; prereq., Dr. 3; 12 hrs.; ar.; 201E.) Mr. French.
- 29su. Drafting. (M.E.) The application of elementary formulas in the proportioning of simple machine parts. Outline and assembly drawings, structural drafting, the development of simple formulas, and graphical methods. (2 cr.; soph. M.E.; prereq., Dr. 28; 12 hrs.; ar.; 201E.) Mr. French.
- 41-42-43su. Technical Drawing. Theory and practice of drawing. Sketching, lettering, tracing, conventions, renderings, blue printing, and mechanical drawing. Preparation of conventional charts and diagrams of particular interest to dentists, designed for dental students. (2-6 cr.; fr. dent.; 12 hrs. ar.; 101E.) Mr. Schuck.
- 69su. Lettering for Nurses. A practical course in plain lettering and the making of graphs and charts. (1 cr.; 11 weeks; no prereq.; T IV; 205E.) Mr. Potter.

SECOND TERM

- 1su. Engineering Drawing. See statement for first term. Mr. Archibald.
- 2su. Engineering Drawing. A continuation of Course 1. (3 cr.; all; prereq., Dr. 1; 2 lect., 16 hrs. lab.; ar.; 201E.) Mr. Archibald.
- 3su. Descriptive Geometry. See statement for first term. Mr. Williams.
- 4-5-6su. Engineering Drawing and Descriptive Geometry. See statement for first term. Mr. Archibald.
- 21su. Drafting. (C.E.) See statement for first term. Mr. Myers.
- 22su. Drafting. (C.E.) See statement for first term. Mr. Myers.
- 23su. Drafting. (C.E.) See statement for first term. Mr. Myers.
- 26su. Drafting. (E.E.) See statement for first term. Mr. Myers.
- 27su. Drafting. (E.E.) See statement for first term. Mr. Myers.
- 28su. Drafting. (M.E.) See statement for first term. Mr. Myers.
- 29su. Drafting. (M.E.) See statement for first term. Mr. Myers.
- 41-42-43su. Technical Drawing. See statement for first term. Mr. Archibald.
- 69su. Lettering for Nurses. See statement for first term. Mr. Williams.

MATHEMATICS AND MECHANICS

FIRST TERM

- 9su. Higher Algebra. Fundamental rules, fractions, linear simultaneous equations, graphs, theory of exponents, surds, complex quantities, quadratic equations, numerical exercises. (No cr.; fr.; prereq., 1 yr. elementary algebra; MTWF III-IV; Th IV-V; 217E.) Mr. Brooke.
- 10su. Solid Geometry. (See Drawing and Descriptive Geometry, page 48.)
- 11su. College Algebra. (5 cr.; fr. eng. arch., chem.; prereq., higher algebra; See College of Science, Literature, and the Arts, Math. 7su., for hours, etc.)

- 12su. 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 cr.; fr. eng., arch., chem.; prereq., 11; MTWF III, IV; Th IV, V; 106E.) Mr. Jones.
- 13su. Analytical Geometry. Co-ordinate systems, equation, 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 cr.; fr. eng., arch., chem.; prereq., 12; MTWF III, IV; Th IV, V; 136E.) Mr. Hartig.
- 25su. 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 integrations, elementary ordinary differential equations. (5 cr.; soph. eng.; prereq., 24; MTWF III, IV; Th IV, V; 215E.) Mr. Dalaker.
- 26su. Technical Mechanics. *Statics and Kinematics*. Characteristics of a force, parallelogram law, moments, couples resultant of a force system, equilibrium of a force system, friction, centroids, moment of inertia. Motion of particle, motion of a rigid body. (5 cr.; soph. eng.; prereq., 25; Sec. 1, MTWThF I, II; Sec. 2, MTWF III, IV; Th V, VI; 203E.) Mr. Herrick, Mr. Johnson.
- 127su. Technical Mechanics. *Dynamics*. Force, mass, acceleration, translation and rotation, gyroscope, governors, work, energy, power, conservation of energy, impulse, momentum, loss of kinetic energy, conservation of momentum. (5 cr.; jr. eng.; prereq., 26; MTWThF I-II; 205E.) Mr. Wilcox.
- 128su. Strength of Materials. Mechanical and elastic properties of materials of construction, beams, shafts, columns, combined stresses, hollow cylinder, rollers, plates, curved bars, springs, dynamic stresses, true stresses. (5 cr.; jr. eng.; prereq., M.&M. 26; MTWF III-IV; Th IV-V; 215E.) Mr. Holman.

SECOND TERM

- 12su. Trigonometry. See statement for first term. (5 cr.; fr. eng., arch., chem.; prereq., 11. See College of Science, Literature, and the Arts, Math. 6su. for hours, etc.)
- 13su. Analytical Geometry. See statement for first term. (5 cr.; fr. eng., arch., chem.; prereq., 12; MTWF III-IV; Th IV-V; 136E.) Mr. Boehnlein.
- 26su. Technical Mechanics. *Statics and Kinematics*. See statement for first term. (5 cr.; soph. eng.; prereq., 25; MTWF III-IV; Th IV-V; Sec. 1, 203E; Sec. 2, 215E.) Mr. Priester, Mr. Miller.
- 127su. Technical Mechanics. *Dynamics*. See statement for first term. (5 cr.; jr. eng.; prereq., 26; MTWThF I-II; 203E.) Mr. Herrick.

MECHANICAL ENGINEERING

WOOD-WORKING COURSES

First Term

- 1su.¹ Machine Wood-Working for Teachers. Cabinet wood construction. Care, use, manipulation, and adjustment of wood-working machinery. Layout and plan of equipment, and course for a high school. (2-4 cr.; all; no prereq.; MTWF I-IV; Th IV; M.E.) Mr. Richards.
- 4su.¹ Teachers' Course in Wood-Turning. Use and care of wood-turning tools. Plain and split turning in centers. Plain and segmental face-plate work. Plan and arrangement of a course. (2-4 cr.; all; no prereq.; MTWThF I-II; M.E.) Mr. Richards.
- 5su.¹ Teachers' Course in Wood-Finishing and Staining. Preparatory treatment of wood, color-mixing, applications of oil and acid stains, shellacing, varnishing, rubbing, and finishing. (2 cr.; all; prereq., I or equiv.; MTWF I-IV; Th I-II; M.E.) Mr. Richards.
- 6su.¹ Teachers' Course in Pattern Work. Materials used. Application of draft, shrinkage, finish to patterns. Core box-making. The relation of pattern work to the foundry. Industrial problems and methods. Organizing a typical course. (2-4 cr.; all; prereq., 4; MTWF I-IV; Th I-II; M.E.) Mr. Richards.
- 11su.¹ Pattern Shop Practice for Engineering Students and Others. Wood-working, pattern-making, and principles. Turning and core box work. Industrial problems and methods showing relation of pattern and foundry practice. (2 cr.; fr. eng.; no prereq.; M I; TWF I-IV; Th I-II; M.E.) Mr. Richards.
- 20su.¹ Furniture-Making for Teachers. Details of designs and construction. Doweling, mortise and tenon work. Bending and setting of shapers. Value and materials used in built up work. Laying of veneer. Layout of a course in high school furniture-making. (2-4 cr.; all; prereq., I; MTWF I-IV; Th I-II; M.E.) Mr. Richards.

FORGE SHOP COURSES

- 9su. Soldering, Brazing, and Welding Course for Teachers. Steel- and iron-soldering; brazing of malleable cast iron and steel; welding and cutting practice with the acetylene torch. Puddling aluminum. (2 cr.; all; no prereq.; M I, VIII; TWF I-IV; Th I-II; M.E.) Mr. Hughes.
- 10su. Heat Treatment of Steel for Teachers. Case carburizing, cyanide hardening, theory and practice of hardening, annealing, and tempering tool and high speed steels. Pyrometer control. Commercial values and application. (2 cr.; all; no prereq.; M I, VIII; TWF I-IV; Th I-II; M.E.) Mr. Hughes.
- 13su. Forge Practice for Teachers and Students. Drawing and working mild and tool steels, stock calculations. Welding, hardening, and tempering. Equipment, tools, and coal used. (2 cr.; all; no prereq.; M I, VIII; TWF I-IV; Th I-II; M.E.) Mr. Hughes.

¹ A laboratory fee of \$1.50 is charged for this course.

MACHINE SHOP WORK

- 3su.¹ Elementary Machine Shop Practice for Teachers. Lathe, shaper, planer, and drill press manipulation; the grinding, care, and kinds of cutting tools. Layout of courses and exercises for high school courses. This course can be arranged to include part of 2su. (2-4 cr.; all; no prereq.; M I-VIII; MTWF I-IV; Th I-II; M.E.) Mr. Rogers.
- 7su.¹ Advanced Machine Shop for Teachers. Advanced lathe work, milling machine operation, gear calculation, and cutting. Precision grinding. Layout of typical course. (4 cr.; all; prereq., 3; M I-VIII; TWF I-IV; Th I-II; M.E.) Mr. Rogers.
- 14su.¹ Machine Shop Practice for Mechanical Engineering Students. Bench work, lathe, planer, shaper, drill press work. (4 cr.; soph. mech.; no prereq.; M I-VIII; TWF I-IV; Th I-II; M.E.) Mr. Rogers.
- 15su.¹ Advanced Machine Shop Practice for Mechanical Engineering Students. Milling machine, precision grinding, production work, acetylene welding. (4 cr.; soph. mech.; prereq., 14; M I-VIII; TWF I-IV; Th I-II; M.E.) Mr. Rogers.
- 16su.¹ Elementary Machine Shop for Electrical Engineering Students. Bench work, lathe, planer, shaper, drill press, and milling machine operation. (2 cr.; soph. elec.; no prereq.; M I-VIII; TWF I-IV; Th I-II; M.E.) Mr. Rogers.

¹ A laboratory fee of \$1.50 is charged for this course.

THE COLLEGE OF AGRICULTURE, FORESTRY, AND HOME ECONOMICS

GENERAL INFORMATION

Through the Summer Session the field plots, orchards, livestock, libraries, laboratories, museums, shops, machinery, classrooms, instruction, and other facilities used by students during the regular college year are made available to those who attend during the summer months.

The work offered in agriculture and home economics seeks to meet the needs of graduates of arts colleges and normal schools, teachers of secondary schools, principals of schools (especially of consolidated schools), superintendents of schools, and others who desire courses in agriculture or home economics, and who wish to obtain therefor college credit, as well as to meet the needs of students seeking to complete the undergraduate college work.

GRADUATE STUDY

Opportunity is offered in several divisions for graduate study either for the first six-week term of the Summer Session or for the entire session of eleven weeks. In some divisions both course and thesis work may be carried for the entire quarter. In a number of other divisions thesis work only may be pursued through the summer quarter. Students intending to register for any phase of graduate work and who expect to obtain credit in the Graduate School should make arrangements through the proper committees and with the dean of the Graduate School. Information concerning graduate work during the summer, in any division, may be obtained from the head of the division. Thesis and problem work is correlated in most divisions with the work in the Experiment Station and the facilities offered during the summer are in most divisions especially attractive on account of the field work possible only at that time.

ADMISSION

The undergraduate courses of the Summer Session are open to all mature men and women who are considered qualified to pursue the chosen work to advantage, but college credit will be given only when college entrance requirements have been fulfilled.

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

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

CONSOLIDATED SCHOOL PRINCIPALS

In small schools the superintendent or principal may act as special teacher of agriculture by fulfilling the requirements established by the State Board. These include the regular qualifications for a teacher of agriculture and also the qualifications for superintendent or principal.

The Summer Session of the University offers opportunity to take courses preparatory for the fulfillment of these requirements.

Intensive Training Course for Teachers of Vocational Agriculture

The Department of Agricultural Education of the University of Minnesota, represented by its faculty, and the State Board for Vocational Education, represented by the director of vocational education and the state supervisor of agriculture, have for several years conducted a brief Intensive Training Course for agricultural teachers in service.

A week of similar character will be conducted this year at University Farm during the week of June 22 to 27.

This intensive training work will in no way supplant the regular six weeks' Summer Session, June 19 to August 1, when regular college courses in education, agricultural education, and agriculture are offered by the University.

Men now in service will do well to take the regular summer session courses in order to be prepared to obtain greater value from the Special Intensive Training Week.

AGRICULTURAL BIOCHEMISTRY

FIRST TERM

- 2su. Quantitative Methods. A brief course in the principles of quantitative analysis, including a study of stoichiometric problems, practice in the use of the balance and in typical gravimetric and volumetric manipulations. (5 cr.; jr., sr.; prereq., 1 yr. chem.; MTWF I, II, III, IV; Th I, II.) Mr. Haag.
- 3su. Types of Carbon Compounds. An elementary study of the different groups of carbon compounds, with special reference to their relationships and their occurrence in plant and animal materials used as food. (6 cr.; soph., jr., sr.; prereq., 1 yr. chem.; MTWThFS I, II; 201Ch.) Mr. Haag.
- 7su.¹ 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. (5 cr.; soph., jr., sr.; prereq., 10 cr. in chem.; MTWF I, II, III, IV; Th I, II; 203Ch.) Mr. Haag.
- 108asu. 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. (3 cr.; jr., sr., grad.; prereq., 3 or 7-8; ar.; 201Ch.) Mr. Bailey.

¹ A laboratory fee of \$1.50 is charged for this course.

- 109asu.¹ Selected Flour Laboratory Methods. A laboratory course in which particular attention is given to recently developed methods for testing wheat products. Less extensive than 110. Designed for men with commercial laboratory experience. Not open to students who have credit in Course 110. (3 cr.; prereq., 101-102 or Chem. 131-132; ar.; 7Ch.) Mr. Bailey, Mr. ———.
- 110asu.¹ Flour Laboratory Methods. A laboratory course in methods of analysis of wheat and its products; milling tests of wheat, baking, and special tests of flour. Designed to train students for research and control work in the cereal industry. Not open to students who have credit in Course 109. (5 cr.; jr., sr., grad.; prereq., same as 109a; ar.; 7Ch.) Mr. Bailey, Mr. ———.
- 111su. Phytochemistry. An 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. (3 cr.; sr., grad.; prereq., biol. 10 cr., org. chem.; MWF I, II; 251Ch.) Mr. Sandstrom.
- 113su.¹ 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. (2 or 3 cr.; sr., grad.; prereq., quant. anal. parallel, 111-112; T I, II, III, IV; Th I, II, IV; MW III, IV; 7Ch.) Mr. Sandstrom.
- 118asu.¹ Laboratory Problems in Biochemistry. Special laboratory work in the preparation and isolation of pure compounds which occur in living cells, in the study of biochemical reactions, and in special methods of identification or determination of biochemical products. (1½ or 2½ cr.; sr., grad.; prereq., 111-112, 113-114, or 103 or 110; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.
- 203asu.¹ Research Problems. Special work on particular research problems other than the student's major thesis. Facilities are provided for biochemical investigations and for advanced studies in plant, animal, or human nutrition. (1½ or 2½ cr.; grad.; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.

SECOND TERM

- 8su.¹ General Agricultural Biochemistry. Second part of Course 7su. (5 cr.; soph., jr., sr.; prereq., 7; MTWF I, II, III, IV; Th I, II; 203Ch.) Mr. Haag.
- 112su. Phytochemistry. Second part of Course 111su. (3 cr.; sr., grad.; prereq., 111; MWF I, II; 251Ch.) Mr. Sandstrom.
- 114su.¹ Biochemical Laboratory Methods. Second part of Course 113su. (2 or 3 cr.; sr., grad.; prereq., 113; T I, II, III, IV; Th I, II, IV; MW III, IV; 7Ch.) Mr. Sandstrom.

¹ A laboratory fee of \$1.50 is charged for this course.

- 118bsu.¹ Laboratory Problems in Biochemistry. Second part of Course 118su. (1½ or 2½ cr.; sr., grad.; prereq., 118a; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.
- 203bsu.¹ Research Problems. Second part of Course 203asu. (1½ or 2½ cr.; grad.; prereq., 203a; ar.) Mr. Gortner, Mr. Bailey, Mr. Palmer, Mr. Willaman.

AGRICULTURAL ECONOMICS*

FIRST TERM

- Ag. Econ. 110su. Economics of Agricultural Production I. (3 cr.; jr., sr., grad.; prereq., Ag. Econ. 1 and 2, or a course in principles of economics; MTWThFS V; 307Ad.) Mr. Black, Mr. Peterson.
- Ag. Econ. 126su. Economics of Consumption. (3 cr.; jr., sr., grad.; prereq., Ag. Econ. 1, or a course in the principles of economics. Intended especially for students in home economics; MTWThFS III; 203HE.) Mr. Waite.
- Ag. Econ. 130su. Prices of Farm Products. (3 cr.; jr., sr., grad.; prereq., Ag. Econ. 1 and 2, or a course in the principles of economics; MTWThFS III; 307Ad.) Mr. Working, Mr. Rowe.
- Ag. Econ. 141su. Marketing Organization: Semi-Perishables. This course this summer will consider especially the marketing of dairy products and poultry and eggs. (3 cr.; jr., sr., grad.; prereq., Ag. Econ. 1 and 2, or a course in the principles of economics; MTWThF VI, and one hour to be arranged; 307Ad.) Mr. Price, Mr. Rowe.
- Ag. Econ. 190su. Advanced Agricultural Statistics. (3 cr.; grad.; prereq., a course in statistics; MTWThFS IV; 317Ad.) Mr. Working.
- Ag. Econ. 240su. Seminar in the Marketing of Cereals. (3 cr.; grad.; MWF VII, VIII; 307Ad.) Mr. Price.

SECOND TERM

- Ag. Econ. 111su. Economics of Agricultural Production II. (3 cr.; jr., sr., grad.; prereq., Ag. Econ. 1 and 2, or a course in the principles of economics; MTWThFS III; 307Ad.) Mr. Black, Mr. Peterson.
- Ag. Econ. 144su. Principles of Co-operation. (3 cr.; jr., sr., grad.; prereq., one course in marketing; MTWThFS IV; 307Ad.) Mr. Black, Mr. Price, Mr. Gaumnitz.
- Ag. Econ. 206su. Seminar in Agricultural Policy. (3 cr.; grad.; MWF VI, VII; 307Ad.) Mr. Black, Mr. Peterson.

AGRICULTURAL EDUCATION

(For further information about these Agricultural Education courses, see announcement in College of Education portion of this bulletin, page 89.)

82. Agricultural Extension Field Work, ar.
141. Supervised Practice in Vocational Agriculture, MTWThFS II.
171. Problems in Procedure, MTWThFS IV.
224. Graduate Problems, ar.

* See also courses in School of Business, page 105.

¹ A laboratory fee of \$1.50 is charged for this course.

AGRONOMY AND FARM MANAGEMENT

FARM CROPS

First Term

- 124su. Advanced Farm Crops. This course includes a survey of modern farm practices and emphasizes the application of recent discoveries in plant science to crop production problems. It is especially designed to meet the needs of instructors in Smith-Hughes schools. (3 cr.; sr., grad.; prereq., 121, 122, 123 or equiv.; MTWThF VII; MWF VIII; 2Ad.) Mr. Army, Mr. Steinmetz.
- 218su. The Classification and History of Crop Plants. Assignments, discussions, and laboratory work covering (a) a study of crop plants and related wild forms with their distribution, followed by (b) a study of the characteristics of species and varieties of crop plants which are useful in identification and systematic classification. The materials necessary to make the classifications are available. (3 cr.; sr., grad.; prereq., Bot. 4, 5, 6; Agron. and Farm Mgt., 121, 122, 123; MWF I, II; 2Ad.) Mr. Army.

PLANT BREEDING

First Term

- 201su. Research in Plant Breeding. Special problems in plant breeding technique, inheritance of plant character, and cytological studies in relation to plant genetics. May be taken as major or minor work. (3 cr.; grad.; prereq., Agron. and Farm Mgt. 131, 132; ar.; 4Ad.) Mr. Hayes, Mr. Griffee.
- 219su. Laboratory in Plant Breeding Methods. Supplementing 211f. Practice in field laboratory technique, methods of controlling pollination and handling of plant cultures. (3 cr.; grad.; prereq., Agron. and Farm Mgt. 131, 132; ar.) Mr. Griffee.

ANIMAL HUSBANDRY

FIRST TERM

- 115su. Livestock Feeding and Management. A review of recent literature on livestock production. Discussion of recent results in animal husbandry research. Practice in livestock management problems. Includes market stock and purebred livestock production. Primarily for Smith-Hughes teachers. (3 cr.; no prereq.; MTWTh IV; TTh VI, VII, VIII; center St.) Mr. Peters.

DAIRY HUSBANDRY

FIRST TERM

- 114su. Problems in Dairy Husbandry. A study of special problems in dairy feeding, selection, and management for the teacher and extension worker. (3 cr.; prereq., 1, 101, one year's experience as high school teacher, county agent, or extension specialist; MTWThFS I; 100 Haecker Hall.) Mr. Eckles, Mr. Gullickson.

- 208su. Research in Dairy Husbandry. Facilities offered for study and investigation of subjects pertaining to dairy cattle. Students are allowed to assist at times with investigations under way in the experiment station. Arranged to meet the needs of individual students. Open in Summer Session only to students who have had preliminary graduate work. Mr. Eckles.
- 209su. Research in Dairy Products. Opportunity and facilities are offered for study and investigation of problems concerning common dairy products. The work is arranged to meet the needs of the individual student. Open in Summer Session only to students who have had preliminary graduate work. Mr. Combs.

SECOND TERM

- 210su. Research in Dairy Husbandry. Continuation of 208su. Mr. Eckles.
- 211su. Research in Dairy Products. Continuation of 209su. Mr. Combs.

ENTOMOLOGY AND ECONOMIC ZOOLOGY

FIRST TERM

- 44su. Animal Parasites. A study of the more common animal parasites of man and domestic animals, and of methods of avoidance and control. (3 cr.; soph., jr., sr.; prereq., zool. 1 yr.; MWF VI, VII, VIII; 202AB.) Mr. Riley, Mr. Philip.
- 120su. Advanced Ecology. An intensive study of an aquatic environment. (5 cr.; prereq., 117-118-119; ar. 401AB.) Mr. Chapman.
- 144su. Animal Parasites and Parasitism. Lectures and laboratory work. Origin and biological significance of parasitism; structure, life history, and economic relations of representative parasites. (3 cr.; jr., sr., grad.; prereq., zool. 1 yr.; MWF VI, VII, VIII; 202AB.) Mr. Riley.
- 197su. Introduction to Research. Preparation for investigational work in lines of entomology and parasitology. Advanced laboratory, field, and library work; training in the preparation of bibliographies and manuscripts; special problems. The following lines of work are open:
- Systematic Entomology, Mr. Oestlund.
 - General Economic Entomology, Mr. Ruggles.
 - Insect Ecology, Mr. Chapman.
 - Insect Morphology, Parasitology, Mr. Riley.
- (2½ or more cr.; sr.; prereq., 37-38-39 or 44, 45, and other prescribed work; ar.)
- Research. Ample opportunity for research work in various phases of entomology and parasitology will be afforded properly qualified students. This work will be individual and it is advised that students planning to undertake special problems correspond with the division relative to methods of collection and preparation of material.

HOME ECONOMICS

FIRST TERM

- 3su.¹ Textiles. Designed to train better consumers of fabrics. Involves study of textile fibers, their structure, properties, and chemical reactions; structure of fabrics; art and economic consideration on selection of clothing and household furnishings. (3 cr.; no prereq.; MTWThF I, II; 311HE.) Miss Weller.
- 13su.² Dressmaking. Modeling, construction of wool skirt, tailored silk blouse, choice of wool service dress or wool sport suit, and a remodeling problem; consideration of textile and art applications in selection of materials and designs. (5 cr.; soph., jr., sr.; prereq., 3, 11 or its equivalent, 51; MTWThF VI, VII, VIII, IX; 304HE.) Miss Keever.
- 17su.¹ Advanced Clothing Construction. Laboratory problems in costume modeling and construction of children's garments. (3 cr.; jr., sr.; prereq., 13, 53; MTWFS III, IV; 304HE.) Mrs. Searles.
- 19su.² Nutritional Aspects of Health. A discussion of the principles of human nutrition as they relate to the promotion of health. (2 cr.; prereq., chem. and zoology or physiology or botany. MTWTh VI; 201WGM.) Miss Leichsenring.
- 20su.¹ Economic Aspects of the Food Supply. A study of the quality and cost of foods on the market. Laboratory and field work. (2 cr.; no prereq.; MTThF VI-VII; 207HE.) Miss Rivers.
- 23su.¹ Nutrition I. (1) The groups of compounds occurring in the cell and in food; (2) digestion, and (3) absorption. (5 cr.; soph., jr., sr.; prereq., 21 or 26, Agr. Biochem. 3; MTWFS III, IV; MTWThF VI, VII; 211-213HE.) Miss McMahan.
- 30su. Problems in Home-Planning and Furnishing (for teachers). A study of the problems involved in choosing, planning, and furnishing a home. Emphasis will be placed on the choice of projects; sources for illustrative material and methods of presenting such problems to students of high school age. (2 cr.; prereq., 51 or equivalent; MTThF VI, VII; 114HE.) Miss Bacon.
- 34su. Home Management: Operation and Maintenance, Lectures. Discussion of the management responsibilities of the homemaker with emphasis on household accounts. (3 cr.; jr., sr.; prereq., 22, Econ. 5; MTWThF VIII; 203HE.) Miss Amidon, Miss Osbeck.
- 35su. Home Management: Operation and Maintenance, Laboratory. Six weeks actual residence and experience in a home management house with various household management problems including the care and training of a child of pre-school age. (6 cr.; jr., sr.; prereq., 22.) Miss Amidon, Miss Osbeck.

¹ A laboratory fee of \$1.50 is charged for this course.

² Designed for experienced social workers, for school and public health nurses, teachers of physical education and home economics.

- 51su.¹ Drawing and Design. Composition, perspective, color theory, and color harmonies applied to costume design and interiors; harmony, proportion, emphasis, balance, and rhythm, in design. (3 cr.; no prereq.; MTWFS III, IV; 114HE.) Miss Bacon.
- 58su.¹ Costume Design. The application of design and color in costumes suitable to types of individuals. The aim is to plan wardrobes consisting of the minimum number of garments which are suitable for the greatest number of occasions. (3 cr.; jr., sr., prereq., 13, 53, 55 recommended; MTWThFS I, II; 114HE.) Mrs. Searles.
- 61su. Large Quantity Cookery and Marketing. Application of principles of cookery to large quantity preparation; planning of meals for dining hall and cafeteria; calculation of cost and calories in standard servings; study of problems involved in purchase of institution supplies. (4 cr.; jr., sr.; prereq., 22; lect., MTh II; 213HE; lab., MTWFS I, II, III.) Miss McFarland.
- 63su. Institution Experience. Experience in the minor problems of administration. (3 cr.; jr., sr.; prereq., 22; lect. ar., lab. ar.) Miss McFarland.
- 70su.¹ Food Preparation. A study of the principles underlying cookery with special emphasis on the preparation of foods to be used in homes with limited incomes. (3 cr.; soph., jr., sr.; prereq., 10 cr. in a laboratory science; MTWFS III, IV; 207HE.) Miss Rivers.
- 103su.¹ Dietetics. The fundamental principles of human nutrition as applied to the feeding of individuals and groups under conditions of health and under such pathological conditions as are chiefly dependent on dietetic treatment. (3 cr.; sr., grad.; prereq., 108, 104 parallel; MWF VI, VII; 203HE.) Miss Biester.
- 104su. Field Work in Dietetics. Laboratory, case and group work in problems of feeding. (2 cr.; sr., and grad.; prereq., 108, 103 parallel. Students specializing in dietetics should register for Course 156, Special Field Work; 3 cr. listed in the Medical School bulletin instead of H.E. 104; W III, IV, Th III; 106HE.) Miss Biester, Miss Leichsenring.
- 122su.¹ Advanced Textiles. An experimental study of textile problems such as shrinkage and other laundering applications; textile legislation; and special economic problems. (3 cr.; jr., sr.; prereq., 3, Agr. Biochem. 3, Econ. 5 or parallel; MWF VI, VII, VIII; 305-311HE.) Miss Phelps.
- 123su. Clothing Economics. General consideration of economic function of women with reference to clothing and textiles in the home and in industry; study of clothing budget, hygiene and standardization of dress. (2 cr.; jr., sr.; prereq., 13, Econ. 5; MTWF V; 309HE.) Miss Weller.
- 126su.¹ Textile Analysis. Problems and application of quantitative methods in analysis with special reference to establishing standards for fabrics. (3 cr.; prereq., 122, Agr. Biochem. 2; MTWThF I, II; 313HE.) Miss Phelps.

¹ A laboratory fee of \$1.50 is charged for this course.

- 145su. Home Economics Survey. A discussion of the historical development of home economics with emphasis upon current practices and problems. (2 cr.; jr., sr., grad.; MTWTh IV; 313HE.) Miss McNeal.
- 205su. Home Economics Seminar. A critical study of selected topics and recent advances in home economics involving outside readings, oral and written reports. (2 cr.; hours and days ar.) Miss McNeal, Miss Biester, Miss Leichsenring, Miss Phelps.

SECOND TERM

- 34su. Home Management: Operation and Maintenance, Lectures. Discussion of the management responsibilities of the homemaker with emphasis on household accounts. (3 cr.; jr., sr.; prereq., 22, Econ. 5; MTWThF II; 203HE.) Miss Amidon, Miss Osbeck.
- 35su. Home Management: Operation and Maintenance, Laboratory. Six weeks actual residence and experience in a home management house with various household management problems including the care and training of a child of pre-school age. (6 cr.; jr., sr.; prereq., 22.) Miss Amidon, Miss Osbeck.

HOME ECONOMICS EDUCATION

FIRST TERM

- 42su.¹ Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. Actual class work illustrating principles of teaching. (5 cr.; jr., sr.; prereq., 13, 22, Psy. 1-2, Agr. Ed. 11 or Ed. Psy. 55; MTWThF VII, VIII; 313HE.) Miss Beulah Coon.
- 141su.¹ Problems in Home Economics Education. Problems of administration and supervision of home economics, study of curricula for the day, part time, and evening schools, consideration of the home project and related work. (2 cr.; sr.; prereq., 42; MTWF IV; 203HE.) Miss McNeal, Miss Coon.

HORTICULTURE

FIRST AND SECOND TERMS

- 192su. Special Problems. Problem based on the work given in the preliminary courses. (Jr., sr., grad.; ar.) Mr. Alderman and horticultural staff.

Courses Primarily for Graduate Students

- 204su. Fruit-Growing Research. Special problems in fruit culture or disposal. Students will be required to continue the work over at least one summer to arrange for concentration on problems at the most appropriate season. Open to those who have specialized in fruit-growing. Three to 6 credits per quarter. Mr. Alderman, Mr. Brierley.

¹ Prerequisites waived for teachers of home economics.

- 212su. Fruit-Breeding Research. Consists of (a) some thesis problem, (b) development of laboratory technique in breeding. Work involves reading in genetics, cytology, biometry. Students required to continue work over one summer. Open to limited number specializing in fruit-breeding. Three to 6 credits per quarter. Mr. Alderman, Mr. Hayes.
- 234su. Vegetable-Growing Research. Special problems in vegetable culture. Students will be required to continue the work over at least one summer. Open to those who have specialized in vegetable-growing. Three or 6 credits per quarter. Mr. Krantz.

PLANT PATHOLOGY AND BOTANY

FIRST TERM

- 111su.¹ Diseases of Field Crops. Special detailed study of diseases of cereal and forage crops, including symptomatology, etiology, and practical methods of control. Laboratory, lecture, and greenhouse work. (3 cr.; jr., sr.; prereq., 1; ar.; 1,2PP.) Mr. Stakman, Mr. Henry, Mr. Christensen.
- 112su.¹ Diseases of Fruit Crops. Special study of diseases of fruit crops, especially those important in Minnesota. Laboratory, lecture, and greenhouse work. (3 cr.; jr., sr.; prereq., 1 or 10; ar.; 1,2PP.) Mr. Leach.
- 113su.¹ Diseases of Vegetable Crops. A detailed study of diseases of potatoes and other vegetable crops. Lecture, reference, laboratory, and greenhouse work. (3 cr.; jr., sr.; prereq., 1 or 10; ar.; 1,2PP.) Mr. Leach.
- 206su. Special Problems. This is a course primarily for graduate students. Special assignment of work in laboratory and field problems in pathological research. Mr. Stakman.

SECOND TERM

- 206su. Special Problems. Continuation of same course offered in first term. Mr. Stakman.

¹ A laboratory fee of \$1.50 is charged for this course.

THE LAW SCHOOL

A number of courses will be offered by the Law School faculty for the summer quarter, June 19 to September 5. The quarter will be divided into two terms, the first from June 19 to August 1, and the second from August 1 to September 5. Students may attend either or both terms. Each course listed has four lectures each week and carries two quarter credits. The maximum number of credits which may be earned each term is six, twelve for the quarter. All classes will be held in the forenoon Monday to Friday inclusive.

The summer quarter courses in law are designed to enable students to lighten the burden of the regular academic year, or to supplement the course which is required for the degree. As the work in the Law School is organized on a year basis, attendance during the summer quarter will not accelerate graduation. Credits obtained in the summer quarter may be applied toward the work for the law degree, but attendance for three regular academic years is required for the degree whether summer work is done or not. Students are urged to use the opportunity to supplement their course.

No work is offered for beginning students. All students who have had one year of law are eligible for the subjects listed and can study them profitably. Regular entrance requirements will not be enforced during the summer quarter. The only prerequisite is the completion of one year of law study in this or another law school.

The tuition is \$50 for the quarter, \$25 for either term.¹

COURSES

First Term

Bankruptcy. Origin, history, and nature of the bankruptcy law; jurisdiction of the courts; acts of bankruptcy; practice; receivers; claims; preferences; assets, trustees; liens; adverse claimants; summary jurisdiction; crimes, composition, discharge. Holbrook and Aigler, *Cases in Bankruptcy*. Mr. Fletcher.

Carriers and Public Service Companies. Origin and development of the law of public callings; common carriers of goods and passengers; telephone, telegraph, gas, electric companies; limitation of liability; state and federal regulation. Green, *Cases on Carriers*. Mr. Fletcher.

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. Mr. Rottschaefer.

¹ These fees include the following in addition to tuition: health fee, Minnesota Union or Shevlin Hall fee, recreation fee, and post-office box rental. In addition a general deposit of \$5 is charged, part of which is returned.

Taxation. Will deal with the nature of taxes, the purposes for which taxes may be levied, the jurisdiction to tax, limitations on the taxing power, kinds of taxes, mode of assessment and collection; special emphasis will be placed on questions arising under present day income and franchise tax laws. Beale, *Cases on Taxation*. Mr. Rottschaefer.

Second Term

- Equity III. Equitable Remedies. Bills of interpleader; bills of peace; cancellation and surrender of contracts; cloud upon title; reformation and rescission for mistake; varieties of mistake and their legal consequences. Ames, *Cases on Equitable Jurisdiction*, Vol. 2. Mr. ———.
- Municipal Corporations. Nature and functions of municipal corporations; their creation, alteration, and dissolution; their internal organization and powers; and their liabilities. Beale, *Cases on Municipal Corporations*. Mr. ———.
- Persons. Marriage and divorce; parent and child; guardian and ward; property law peculiar to the marriage relation; rights and liabilities of persons under the disabilities of coverture, infancy, insanity, etc. Paige, *Cases on Domestic Relations*. Mr. Paige.
- Suretyship. The surety distinguished from the guarantor, the guaranty insurer, and the endorser; surety's defenses against creditor; surety's rights to subrogation, indemnity, contribution, and exoneration; creditor's rights to surety's securities. Ames, *Cases on Suretyship*. Mr. Paige.

THE MEDICAL SCHOOL

GENERAL INFORMATION

THE SUMMER QUARTER—TERMS

The first term of the summer quarter will extend from June 19 (classes begin June 22) to August 1, the second, from August 3 to September 5. Students may attend either or both terms.

GENERAL

Any of the courses offered by the departments of the Medical School are open to any student in the Summer Session, who has the necessary prerequisites.

COURSES FOR MEDICAL STUDENTS

CLINICAL YEARS

The Medical School offers full courses for the first quarter of the junior year, and the second quarter of the senior year. In order to receive legal time credit toward the degree of doctor of medicine or bachelor of medicine in this institution, students must be matriculated in the Medical School; see the annual bulletin of the Medical School for requirements for admission and regulations governing advanced standing. Medical students from other schools who desire to enter for the summer only may do so as unclassified students, receiving subject credits only. If such students desire legal time credit toward a medical degree they should arrange same with the institution from which they intend to take such degree. No obligation to accept such students into regular classes at this school may be attached to unclassified registration. Such students may take one of the programs listed below and make up a special program from the courses offered.

PROGRAMS FOR CLINICAL YEARS

The following are the required courses in the clinical years, to be offered, together with hours and days per week.

Students from other institutions should consult the Medical School bulletin to make sure in what degree the courses listed fulfill their respective needs. They should consult their own department heads as to the equivalence of courses offered at the University of Minnesota to those required in the medical school where they expect credit.

Fifth Year (Junior Medical)

The first quarter courses of the fifth year (junior medical) will be given in the summer of 1925. These courses are as follows: Medicine 51su, 53su, 54su, 57su, 67su, and 71su. Obstetrics 51su, 54su, and 62su. Pediatrics 103su and 104su. Pharmacology 105su and 108su. Surgery 59su and 61su. See departmental statements for hours and credits.

Sixth Year (Senior Medical)

The program for the summer quarter will consist of the following courses. For descriptions and schedules see departmental statements.

Medicine 63su

Obstetrics 53su and 56su

Pathology 109su

Hospital 79su (Roentgenology)

Clerkship and Dispensary, 30 hours a week. See departmental statements and special schedules. Under the curriculum senior students are assigned to a particular clerkship and to particular dispensary clinics each quarter. Qualified students from other schools may elect clerkships and other clinics offered to the extent of the capacity of these exercises.

LABORATORY YEARS

No regular programs for freshman or sophomore medical students are offered, but many of the courses of these years will be given (see departmental statements for description of courses, program of hours, and laboratory fees). These courses may be taken by properly prepared students from other institutions as unclassified students, without matriculation. But students who desire to secure time credit toward the degree of doctor or bachelor of medicine in this school must matriculate in the regular way (see previous paragraph and requirements in the annual bulletin of the Medical School).

OPPORTUNITIES FOR PRACTITIONERS

All the courses offered are open to physicians, who will be registered as special students. Attention is also called to short courses offered from time to time under the Extension Division. These courses are for practitioners and are largely practical in nature. Circulars will be sent on request.

The regular clinics in the University Hospital and Dispensary, the Minneapolis General Hospital, and the Ancker Hospital, St. Paul, will go on as usual during the summer quarter, and will be open to visiting physicians.

FEES

Medical students electing the programs of clinical subjects in the junior and senior medical years must, and others may, pay the regular quarterly tuition fee of the Medical School, namely, \$60 for residents of Minnesota and \$70 for nonresidents. Less than a full program may be paid for on a clock hour basis, namely \$2.50 (nonresidents, \$3), for each weekly clock hour of scheduled work per quarter.

Laboratory fees are not payable under this plan; but the following extra fees are charged: health fee, \$2; Minnesota Union or Shevlin Hall fee, \$1; deposit,¹ \$10.

Term fees are, in each case, half the quarterly fees.

¹ For students who pay the regular quarter fee in medicine a two-dollar recreation fee will be deducted from the general deposit fee.

Students who do not desire time credit on the medical course may pay the regular summer session fee of \$25 per term. No extra fees except the laboratory fees of the courses selected and the deposit fee are chargeable under this plan. Such students will register in the Summer Session and not in the Medical School.

ELECTIVES

Various electives will be offered in the clinical departments including dispensary and hospital clinics, clerkships, electrocardiography, etc. See departmental statements in this bulletin and also special summer quarter programs of the Medical School (to be published later) for details.

The electives offered in the laboratory departments are also described in the departmental statements in this bulletin.

NURSING STUDENTS

No beginning students can be received in the summer quarter. For the regular courses, requirements, etc., see the bulletin of the School of Nursing.

FEES FOR STUDENTS IN THE SCHOOL OF NURSING

For students in the School of Nursing, whose work in the Summer Session is entirely in the hospitals, or in field service not involving instruction by members of the staff who are paid from the summer session budget, there will be no tuition fee. For students who take regular class work on the campus which is in charge of members of the staff who are paid from the summer session budget, a tuition fee at the rate of \$1 per clock hour for the courses pursued shall be charged.

PUBLIC HEALTH NURSING

See Department of Preventive Medicine and Public Health in this bulletin.

COURSES IN MEDICAL TECHNOLOGY

The demand for clinical and laboratory technicians, trained in the principles and technique of the medical sciences is increasing. The vocation is one that offers satisfactory objectives, a large measure of usefulness, and fair compensation.

A special circular on courses for medical technicians will be sent upon request.

Excellent courses for medical technicians are offered in the summer quarter. See departmental statements.

COURSES FOR DENTAL STUDENTS

For appropriate courses in the laboratory sciences, dental students should consult the departmental statements which follow. For dental clinical courses see page 81.

ANATOMY

FIRST TERM

- 5su. Gross Human Anatomy. Dissection of abdomen and lower extremity. Disarticulated skeletons issued for study of osteology. (9 cr.; 3rd yr. med.; prereq., An. Biol. 1-2; MTWThFS I, II, III, IV; TTh VI, VII, VIII; 304,306IA.) Laboratory fee, \$7.50. Class limited to 48. Dr. Erdmann and assistants.
- 9-10su. Systematic Anatomy. Human osteology and splanchnology, with dissection of the pig fetus. (10 cr.; 1st yr. dent.; prereq., An. Biol. 1-2; MTWThFS I, II, III, IV; MWF VI, VII, VIII; 313,301IA.) Laboratory fee, \$7.50. Class limited to 30. Dr. Miller and assistant.
- 14su. Histology and Embryology. Minute structure and development of the tissues and organs, with special emphasis upon the oral region and digestive tract. (6 cr.; 2d yr. dent.; prereq., An. Biol. 1-2, Anat. 9-10-11; MTWThFS I, II, III, IV; 102,213IA.) Laboratory fee, \$. Dr. Rasmussen and assistants.
- 103su. Human Histology. Minute structure of the various tissues and organs. (9 cr.; 3rd yr. med.; prereq., An. Biol. 1-2, Anat. 5-6-7; MTWThFS I, II, III, IV; MWF VI; 102,214IA.) Laboratory fee, \$7.50. Dr. Rasmussen and assistants.
- 133su. Anatomy of the Fetus and Child. A survey of prenatal and post-natal development. (2 cr.; prereq., Anat. 103; hrs. ar.) Dr. Scammon.
- 156su. Advanced Anatomy. Individual problems in gross anatomy, histology, embryology, or neurology. Includes advanced work for clinical graduate students. Permission by instructor required. Laboratory fee, \$1 per credit. Credits and hours arranged. Dr. Scammon or Dr. Rasmussen.
- 204su. Research in Anatomy. Research work in gross or microscopic anatomy, histology, embryology, or neurology. Permission by instructor required. Credits and hours arranged. Dr. Scammon or Dr. Rasmussen.

SECOND TERM

- 6su. Gross Human Anatomy. Dissection of head, neck, thorax, and upper extremity. Continuation of 5su. (MTWThFS I, II, III, IV; TTh VI, VII, VIII, IX; 304,306IA.) Laboratory fee, \$7.50. Class limited to 48. Dr. Peyton and assistants.
- 11su. Anatomy of the Head and Neck. Human dissection. (First yr. dent. and others; prereq., Anat. 9-10; MTWThFS I, II, III, IV; 304,307IA.) Laboratory fee, \$4. Class limited to 30. Dr. Miller and assistant.
- 111su. Human Neurology. Morphology of the central nervous system and sense organs. (6 cr.; 4th yr. med. and others; prereq., Anat. 103, 107; MTWThF, I, II, III, IV; S I, II; 102,213IA.) Laboratory fee, \$5. Dr. Rasmussen and assistant.
- 156su. Advanced Anatomy. (See under First Term, Course 156.) Permission by Dr. Rasmussen required. Credits and hours arranged.
- 204su. Research in Anatomy. (See under First Term, Course 204.) Permission by Dr. Rasmussen required. Credits and hours arranged.

BACTERIOLOGY

FIRST TERM

- 51su.¹ 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. (5 cr.; prereq., general chemistry and biology; MTWThF VI, VII, VIII; 214,201MH.) Laboratory fee, \$1.50. Dr. Green.
- 114su. The Higher Bacteria. Study of morphology, cultivation, and classification of actinomycetes, yeasts, and molds. (3 cr.; prereq., general bacteriology; MTWF II, III; 201MH.) Laboratory fee, \$1.50. Dr. Henrici.
- 150su. Advanced Bacteriology. Opportunity of working out special problems. (Prereq., General Bacteriology; cr. and hr. ar.) Laboratory fee, \$1 per credit. Dr. Larson.
- 201su. Research and Bacteriology. Graduate students of the necessary preliminary training may elect research, either as major or minor, in bacteriology. (Permission required. Arrange hours and credits. 201MH.) Dr. Larson.

SECOND TERM

- 51su. General Bacteriology. Will be given if sufficient number register.
- 101su. Special Bacteriology. The pathogenic bacteria, especially in relation to definite disease; principles of infection and immunity. Fourth year medical students and others. (4 cr.; 4th yr. med. and others; prereq., general bacteriology; MTWThF VI, VII, VIII; 201,315MH.) Laboratory fee, \$1.50. Dr. Henrici.
- 116su. Immunity. Laws of hemolysis. Quantitative relationship between antigen and antibody. Wasserman reaction. Oponins. Vaccines. Precipitin reaction. Blood-grouping. Abderhalden reaction. Anaphylaxis. (3 cr.; prereq., general bacteriology; MTThF II, III; 201MH.) Laboratory fee, \$1.50. Dr. Henrici.
- 150su. Advanced Bacteriology. Will be given if sufficient number register.
- 201su. Research in Bacteriology. Will be given if sufficient number register.

PATHOLOGY

BOTH TERMS

- 101su. General Pathology. Circulatory disturbances, degenerations, inflammation, tuberculosis, syphilis, tumors, neuropathology. (9 cr.; prereq., histology, anatomy, embryology, biochemistry; MTWThF I, II, III; 104IA.) Dr. Bell.
- 104su. Autopsies. Post-mortem technique; examination of fresh organs, etc. (Hr. and cr. ar.; prereq., 101; 110IA.) Dr. Bell, Dr. Clawson, Dr. McCartney, Dr. O'Brien.
- 106su. Pathologic Technique. Methods of preparation of microscopic and gross specimens. Limited to three students. (Hr. and cr. ar.; 112IA.) Laboratory fee, \$1 per credit. Staff.

¹ Will be repeated in second term if a sufficient number desire it.

- 107su. Advanced Pathology. Laboratory studies in the examination of routine operative and autopsy specimens. Limited to three students. (Hr. and cr. ar.; 110IA.) Laboratory fee, \$1 per credit. Dr. Bell, Dr. Clawson, Dr. McCartney.
- 108su. Diagnosis of Tumors. (3 cr.; 66 hrs.; prereq., Pathology 102; TTh 2:30-5:30; 108IA.) Laboratory fee, \$1.50. Dr. Bell, Dr. McCartney.
- 109su. Clinical Pathological Conference. Presentation of clinical data on selected cases and of the pathological specimens from these same cases, with discussions of etiology and diagnosis. Required in clerkship period. Elective for others. (11 hrs. cr.; F 4:00-4:50; 104IA.) Staff.
- 113su. Externship in Pathology. The student devotes his time to post-mortem work, surgical pathology, and research. (Hrs. and cr. ar.)
- 201su. Research. Students, of the necessary preliminary training, may elect research, either as major or minor in pathology. Permission required. (Hr. and cr. ar.) Dr. Bell, Dr. Clawson, Dr. McCartney, Dr. Warwick.

Note: all courses may be taken either or both terms except 101, which must be taken both terms for credit.

PHARMACOLOGY

FIRST AND SECOND TERMS

- 1su. Elementary Pharmacology. A brief study of drugs for nurses and others. (3 cr.; 44 hrs.; prereq., physiology; M 8:00-11:00 a.m.; W 8:00-8:50 a.m.; 322 MH.) Mr. Gregory.
- 4su. Pharmacology. The history, origin, nature, pharmacal preparations, and use of drugs. (44 hrs. cr.; limited to 2nd yr. dent.; prereq., physiology; TF 2:00-3:00 p.m.; W 2:00-4:00 p.m.; T 3:00-5:00 p.m.; 322MH.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter, Mr. Gregory.
- 102su. Experimental Pharmacology. Exercises illustrating the preparation and action of medicines. Laboratory fee, \$3. (3 cr.; limited to 4th yr. med.; prereq., physiology; TTh 3:00-6:00 p.m.; 322 MH.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter, Mr. Gregory.
- 105su. General Pharmacology. Same as Course 102 in continuation. (22 hrs.; limited to 5th yr. med.; prereq., physiology; TThS III (until Aug. 8); 214MH.) Dr. Hirschfelder, Dr. Brown, Dr. Bieter; Mr. Gregory.
- 108su. Prescription-Writing. The principles of prescription-writing. (5th yr.; 11 hours; TThS III (after August 8); 214MH.) Dr. Brown.
- 109su. Pharmacological Problems. Experimental study of special topics in pharmacology, with a review of the literature. Laboratory fee of \$1 per credit. (3 cr. or ar.; prereq., physiology; 3:00-6:00 p.m. or hrs. ar.; 322MH.) Dr. Hirschfelder, Dr. Brown.
- 203su. Research in Pharmacology. Open to graduate and advanced students. Hours and credits arranged. Dr. Hirschfelder, Dr. Brown.

PHYSIOLOGY

FIRST TERM

- 4su. Human Physiology. A brief course for academic and home economics students. Lectures and laboratory work. (5 cr.; prereq., high school or college biology and chemistry; lect., MTWThF IV; rec. and dem., MWF II, III; lab.,* T I, II, III; Th I, II, V; 301,315MH.) Laboratory fee, \$1.50. Mr. Visscher, Mr. Loucks.
- 58-59su. Human Physiology. An intermediate course for academic, dental, and physical education students, and others. (8 cr.; prereq., general chemistry and anatomy or zoology; lect., MTWThF IV; rec. and dem., MWF II, III; lab.,* T I, II, III; Th I, II, V; TTh or ar. VI, VII, VIII; 315MH.) Laboratory fee, \$3. Mr. Visscher, Mr. Loucks.
- 100su. Physiologic Chemistry. Metabolism of salts, carbohydrates, fats, and proteins in health and disease. (6 cr.; prereq., organic chemistry and physics; lect. MTWThF I; 214MH.; MTWF II, III, IV; Th II, IV, V; 310MH.) Laboratory fee, \$5. Lectures only; 3 cr. may be registered for as 100xsu. Laboratory only as 100ysu. Dr. Pettibone.
- 103su. Physiology of Muscle, Nerve, Blood, Circulation, Digestion. (8 cr.; 4th yr. med and others; prereq., organic chemistry and animal biology; lect., MTWThFS I; rec., MWF II; lab., MWF III, IV; TS II, III, IV; Th II, IV, V; 301,315MH.) Laboratory fee, \$5. Lectures only, 5 cr. may be registered for as 103xsu. Dr. Scott and assistant.
- 113su. Problems in Physiology. Arranged by instructor 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 terms. (3 cr. or ar.; prereq., Courses 103, 104, or equivalent; 310MH.) Laboratory fee, \$1 per credit. Dr. Scott.
- 153su. Problems in Physiologic Chemistry. Arranged by instructor with qualified students for special work. May be taken one or more terms. (3 cr. or ar.; prereq., Course 100-101; 2:30-5:30; TTh or ar.; 310MH.) Laboratory fee, \$1 per credit. Dr. Pettibone.
- 203su. Research in Physiology. Hours and credits arranged. Dr. Scott.
- 205su. Research in Physiologic Chemistry. Hours and credits arranged. Dr. Pettibone.

SECOND TERM

- 101su. Physiologic Chemistry. Continuation of Course 100su. (6 cr.; prereq., organic chemistry and physics; lect., MTWThF I; 214MH.; lab., MTWF II, III, IV; Th I, II, IV, V; 310MH.) Laboratory fee, \$5. Lectures only, 3 cr., may be registered for as 101xsu. Laboratory only as 101ysu. Dr. McClendon.
- 104su. Physiology of the Nervous System and Special Senses, Respiration, Metabolism, Nutrition, and Excretion. (8 cr.; 4th yr. med. and others;

* Students who find it more convenient, may arrange to do part of their laboratory work in the afternoon.

- prereq., Course 103 or organic chemistry and neurology; MTWThFS; lect., I; rec. and lab.,* II, III, IV; 310MH.) Laboratory fee, \$5. Lectures only, 5 cr., may be registered for as 104xsu. Dr. Greisheimer and assistant.
- 113su. Problems in Physiology. Continued as in first term. Dr. Greisheimer.
- 153su. Problems in Physiologic Chemistry. Same as 153su, first term, given above. Dr. McClendon.
- 203su. Research. Continued as in first term. Dr. Griesheimer.
- 205su. Research in Physiologic Chemistry. Same as 205su, first term, given above. Dr. McClendon.

PREVENTIVE MEDICINE AND PUBLIC HEALTH

FIRST TERM

- 50su. Public and Personal Health. Discusses the causes of diseases and of physical defects and presents the fundamental principles and working methods of health conservation and disease prevention. Lectures, demonstrations, discussions, inspection trips, and directed readings. (3 cr.; 48 hrs.; jr., sr., Arts and Educ.; prereq., Biology 1-2, Psychology 1-2; MTWThFS VI; 112MH.) Dr. O'Brien.
- 53su. 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. Vital statistics, school health work. (3 cr.; jr., sr.; prereq., Bacteriology I, Physiology 4 or equiv.; MTWThFS II; 112MH.) Dr. Diehl, Dr. Lees.
- 56su. 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. 18 hours.; sr. med.; prereq., 55; Th; see clerkship schedule; 112MH.) Staff.
- 58su. Maternal and Child Hygiene. Maternal welfare program; importance of breast feeding; origin and conduct, infant welfare clinics in cities and rural communities; consideration of child of pre-school and school age as to malnutrition, physical defects, cardiac and nervous disorders. (2 cr.; 18 hrs.; prereq., 50, 52, or 53; jr., sr.; MTWTh VIII; 112MH.) Dr. Boynton.
- 60su. 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. (2 cr.; 12 hr.; jr., sr.; prereq., 50, 52, or 53; MTWTh I; minimum 12 students to hold course; 112MH.) Dr. Myers.

- 62su. Principles of Public Health Nursing. Development, principles, technique of Public Health Nursing; methods of co-operative endeavor with social agencies; health teaching as an essential factor in promotion of individual, family, and community well-being. Special fields are presented. (3 cr.; public health nurses; prereq., 53 or equiv.; MTWThFS III; 112MH.) Miss Butzerin.
- 63su. Field Practice in Visiting Nursing. For public health nurses. Lectures, demonstrations, supervision, and field practice in bedside care of general and maternity patients; communicable disease, tuberculosis and mental cases with special emphasis upon recognition of social problems, co-operation with social agencies and accurate record-keeping. (5 cr.; 176 hr.; prereq., 62; ar.; 112MH.) Miss Fuller, Miss Zuppann.
- 64su. Field Practice in Infant Welfare Nursing. For public health nurses. Class instruction, observation, and supervised practice in home visiting in the interest of breast feeding and well baby care; in conducting well baby clinics and behavior clinics for pre-school children; in understanding family problems affecting children. (3 cr.; 108 hrs.; prereq., 62; ar.; 112MH.) Miss Butzerin, Miss Peck.
- 65su. Field Practice in School Nursing. For public health nurses. Routine inspections with the school nurse; assistance at medical examinations; general sanitary inspections; home visits; visits to special classes as sight-saving, defective speech and hearing, subnormal, open air, and tuberculosis school. (2 cr.; 80 hrs.; prereq., 62; ar.; 112MH.) Miss Butzerin.
- 66su. Field Practice in County Nursing. For public health nurses. Student nurse observes and assists nurse on rounds in county, in routine physical inspection of school children, home calls, health talks and classes in home nursing, organizing, advertising, and conducting of the rural clinic. (2 cr.; 80 hr.; prereq., 62; ar.; 112MH.) Miss Butzerin.
- 67su. Field Practice in a Tuberculosis Sanatorium. For public health nurses. Observation and practical care of pulmonary, osseous, laryngeal tuberculosis; tuberculosis enteritis; general sanatorium treatment; special treatment; exercise; laboratory; occupational therapy and the reading of literature on tuberculosis. (2 cr.; 80 hr.; prereq., 60 and 62; ar.; 112MH.) Dr. Mariette.
- 68su. School Health Work. Discussion will include: (1) school nursing program, main objectives, scope, and analysis of duties; (2) the teaching of hygiene in the grades including subject-matter, arrangement, and presentation. (1 cr.; prereq., 62 or experience in school nursing; TTh VII; 112MH.) Miss Butzerin.
- 80su. 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. (3 cr.; jr., sr.; prereq., 50 or 52 or 53 or equiv.; MTWThFS I; 112MH.) Dr. Diehl and others.

- 102su. Sanitation. Sanitary supervision of water and milk supplies, sewage, refuse, and garbage disposal systems. Practical work, including field investigations, laboratory examinations, interpretation of results, recommendations to correct unsatisfactory conditions, report-writing and office procedure. (Credits and hours arranged; grad.; prereq., Bacteriology 101, Chemistry 21 or 27, and 32 or 37; Physics 22, 32, 42; ar.; SBH.) Mr. Whittaker, Dr. Archibald, Mr. Childs.
200. Research. Opportunities will be offered by the University and by the various co-ordinated organizations for qualified students to pursue research work. (Cr. ar.; grad.; ar.; 112MH.) Staff.

SECOND TERM

- 56su. Public Health Administrative and Field Work. Same as first term.
- 63su. Field Practice in Visiting Nursing. Continuation of first term.
- 64su. Field Practice in Infant Welfare Nursing. Same as first term.
- 65su. Field Practice in School Nursing. Same as first term.
- 66su. Field Practice in County Nursing. Same as first term.

MEDICINE

FIRST AND SECOND TERMS

Required Courses

- 51su. The Principles and Practice of Medicine. Systematic lectures, exclusive of neurology and dermatology. (33 hrs.; 5th yr.; TThS 9:00-9:50; 129MH.) Dr. Fahr, Dr. Gardner, Dr. Cook.
- 53su. Physical Diagnosis and Case-Taking. Junior students, working two in a room, write histories and make physical examination and provisional diagnosis on assigned dispensary patients under supervision of instructors. The patients are then referred to appropriate special clinics and students follow, so far as possible, the subsequent treatment of their respective patients. (66 hrs.; 5th yr.; Secs. 1 and 3. MWF, or Secs. 2 and 4, TThS, 1:00-2:50; UD.) Dr. Myers et al.
- 54su. Clinical Chemistry and Microscopy. Methods of laboratory examination for diagnostic purposes. (99 hrs.; 5th yr.; prereq., pathology and physiologic chemistry; MWF 3:00-5:50; 129, 301MH.) Dr. O'Brien.
- 55su. Clinics in Medicine; Diagnosis and Therapy. Conducted with sections in the following dispensary clinics: (a) general medicine, 36 hrs. cr.; (b) cardiac and vascular diseases, 18 hrs. cr.; (c) respiratory diseases and tuberculosis, 18 hrs. cr.; (d) thyroid and endocrine diseases, 12 hrs. cr.; (e) gastro-intestinal diseases, 36 hrs. cr. (Total 120 hrs.; 6th yr.; see special schedule; daily 1:00-3:00; UD.) Dr. C. B. Wright and staff.
- 57su. Clinic in Medicine. Fifth year, Division A (11 hrs.; Th 11:00-11:50; UH Lect. Room.) Dr. Fahr, Dr. Barron.
- 58su. Clinic in Medicine. Sixth year, Division A, B, D. (11 hrs.; F 3:00-3:50; UH Lect. Room.) Dr. Richards.

- 65su. Clinical Clerkship. The personal observation of patients in hospital; taking and recording of case histories; making of provisional diagnosis, and study of treatment. One section at a time spends three weeks in residence at the Glen Lake Sanatorium. Sixth year, Sections of Division A. See special schedule. (275 hrs.; 25 hours a week approximately as follows: daily 8:30-12:00; 4 hours or more per week in the afternoon.) Dr. Beard, Dr. Fahr, Dr. Richards, Dr. Barron, Dr. Grey, Dr. McKinley, Dr. Mariette.
- 65xsu. Clinical Clerkship. Same as 65su at Minneapolis General Hospital. Dr. Ulrich and staff.
- 67su. Section Clinics in Medicine. Sections 1 and 2 of Division A, 5th year medicine. (17 hrs.; M 8:30-10:00; Ancker Hospital, St. Paul.) Dr. Hall, Dr. Lepak, Dr. Oerting.
- 67xsu. Same for Sections 3 and 4. (F 8:30-10:00.)

Elective Courses

- 115su. The Respiratory Organs in Health and Disease. For students who desire training in preparation of scientific papers for publication. The student selects a problem pertaining to some part of the respiratory tract, which he pursues independently or in collaboration with instructor. Limited to 5 students. (Hrs. and cr. ar.; 5th and 6th yr.; 111MH.) Dr. Myers.
- 117su.¹ Externship in Medicine. This may be arranged as a partial or complete substitution for the regular clerkship in medicine, depending upon number of hours arranged for, or it may be arranged as an extension of the clerkship in medicine. (Srs.; daily 9:00-12:00; UH.) Staff.
- 118su.¹ Externship in Medicine at Minneapolis General Hospital. History-taking, physical examination, and laboratory diagnosis. (Srs.; daily 9:00-12:00.) Dr. Ulrich and staff.

DIVISION OF NERVOUS AND MENTAL DISEASES

Required Courses

- 71su. Clinics in Nervous and Mental Diseases. (Sections 3 and 4 of Division A, 5th yr. med. 17 hrs.; W 8:30-10:00; Ancker Hospital, St. Paul.) Dr. Hammes, Dr. Kammon.
- 71xsu. Same as 71su. for Sections 1 and 2, Division A. (F 8:30-10:00.)
- 75su. Nervous and Mental Diseases. Observation and study of cases in the University Dispensary; required of clerks in nervous and mental service at University Hospital. Credit included in clerkship, Medicine 65. Dr. J. C. McKinley, Dr. Michael.

Elective Courses

- 119su.¹ Externship in Nervous and Mental Diseases. (Hr. and cr. ar.; prereq., Med. 65; UH.) Dr. Hamilton and staff.

¹ Permission required.

- 123su.¹ Advanced Neuropathology. Individual gross and microscopic studies on existing preparations in neuropathology. Limited to 2 students. (Cr. and hrs. arranged; prereq., Path. 102; 138MH.) Dr. J. C. McKinley.
- 125su.¹ Problems in Neuropathology. The student will be assigned a topic for special study. Limited to 2 students. (Cr. and hrs. ar.; prereq., Path. 102; 138MH.) Dr. J. C. McKinley.

DIVISION OF DERMATOLOGY

Required Courses

- 81su. Skin Diseases, Diagnosis and Therapeutics. Observation and study of cases in the University Dispensary; a part of required clinics. (25 hrs. cr.; see special schedule, sections of sr. class; daily 1:00-2:30; UD.) Dr. Butler, Dr. Michelson, Dr. Olson.

Elective Courses

- 128su. Night Clinic in Dermatology and Syphilis. Limited to 4 students in clerkship division. (33 hrs.; MTh 7:00-8:30; UD.) Dr. Michelson.
- 150su. Histopathology of the Skin. Clinical and pathologic phases will be exemplified. Same as Path. 115. (11 hrs.; prereq., Path. 102; T 2:30-3:20; 108IA.) Dr. Michelson.

OBSTETRICS AND GYNECOLOGY

FIRST AND SECOND TERMS

Required Courses

- 51su. Obstetrics. Physiology of pregnancy, labor, and the puerperium. (33 hrs.; jr.; TThS 8:00-8:50; Hosp. lect. room.) Dr. Litzenberg.
- 53su. Operative Obstetrics. A study of operative obstetrics. Prerequisites: Courses 51 and 52. (11 hours; M 3:00-3:50; 104IA.)
- 54su. Gynecology. Diagnostic methods. (11 hrs.; jr.; S 11:00-11:50; 104IA.) Dr. Barry.
- 56su. Obstetrics and Gynecology. Lectures, class clinics, and case analysis of the pathology of obstetrics and gynecology. (22 hrs.; sr.; MW 4:00-4:50; Hosp. lect. room.) Dr. Litzenberg.
- 58su. Clinical Clerkship in Obstetrics and Gynecology. The personal study and care of assigned patients in the University Hospital, out-patient service, and Salvation Army Home; manikin practice, case histories, physical and laboratory examinations; parturition and bedside clinics, and operations. (66 hrs.; prereq., Courses 51, 52, 53, 54, and 55; sections of Div. B, sr.; daily 8:15-10:15; UH.) Staff.
- 58asu. Clinical Clerkship in Obstetrics and Gynecology. Same as Course 58su, but given at the Minneapolis General Hospital. Staff.
- 59su. Clinic in Obstetrics and Gynecology. History-taking, physical examinations, diagnosis demonstrations, demonstrations, and clinics. (24 hrs.;

¹ Permission required.

- sr.; prereq., Courses 51, 52, 53, and 54. Sections of sr. See special schedule. Daily 10:30-12:00; UD.) Dispensary staff.
- 62su. Clinic in Obstetrics and Gynecology. A part of required section clinics. (17 hrs.; jr.; Sec. 3, M 8:30-10:30; Minneapolis Gen. Hosp.) Staff.
- 62xsu. Same for Sec. 1. (W 8:30-10:00.)
- 62ysu. Clinic in Obstetrics and Gynecology. The same as 62su. (Sec. 4; M 8:30-10:00; Ancker Hospital, St. Paul.) Dr. Hammond, Dr. Schulze.
- 62zsu. Same for Sec. 2. (W 8:30-10:00.)
- 63su. Clinic in Obstetrics and Gynecology. Clinics in dispensary of Minneapolis General Hospital. (12 hrs.; 5th yr. med.; see clerkship schedule. MWF 12:30-2:00.) Dr. LaVake.

Elective Courses

- 104su. Gynecologic Clinic. Diagnosis and treatment of diseases of women. Limited to 4 students. (17 hrs.; TTh 1:30-3:00; Wilder Dispensary, St. Paul.) Dr. Barry, Dr. Bicek.
- 110su. Prenatal Clinics. Antepartum care of pregnant women at the various prenatal stations; limited to one student at each station. (11 hrs.; Wells Memorial, M 9:15, Dr. Simons; Emanuel Cohen Community Center, T 9:45, Dr. Maland; South Town, T 1:30, Dr. Heibert.)

OPHTHALMOLOGY AND OTO-LARYNGOLOGY

FIRST AND SECOND TERMS

Required Courses

- 85su. Clinic in Diseases of the Eye. Methods of examination, diagnosis, and treatment. (25 hrs.; srs., see clerkship schedule; MTWThFS 1:00-2:30; UD.) Dr. Clark, Dr. Macnie, and associates.
- 87su. Clinic in Diseases of the Ear. Methods of examination, diagnosis, and treatment. (25 hrs.; srs., see clerkship schedule; MTWThFS 1:00-2:30; UD.) Dr. Newhart, Dr. Camp, and associates.
- 89su. Clinic in Diseases of the Nose and Throat. Methods of examination, diagnosis, and treatment. (25 hrs.; srs.; see clerkship schedule; MTWThFS 1:00-2:30; UD.) Dr. Patterson, Dr. F. J. Pratt, Dr. J. A. Pratt, and associates.

Elective Courses

- 115su. Clinic in Diseases of the Eye. Examination, diagnosis, and treatment. (99 hrs. cr. or arrange; srs.; MTWThFS 1:00-2:30; UD.) Dr. Clark, Dr. Macnie, and associates.
- 117su. Clinic in Diseases of the Ear. Examination, diagnosis, and treatment. (99 hrs. cr. or arrange; srs.; MTWThFS 1:00-2:30; UD.) Dr. Newhart, Dr. Camp, and associates.
- 119su. Clinic in Diseases of the Nose and Throat. Examination, diagnosis, and treatment. (99 hrs. cr. or arrange; srs.; MTWThFS 1:00-2:30; UD.) Dr. F. J. Pratt, Dr. J. A. Pratt, and associates.

- 121su. Operative Clinic Eye, Ear, Nose, and Throat. (22 hrs. cr.; WS 1:30-3:00; UH.) Dr. Murray, Dr. Macnie, Dr. Patterson.
 126su. Ophthalmoscopy. (Ar.; srs.; MTWThFS 1:00-2:30; UD.) Dr. Clark, Dr. Macnie, and associates.

PEDIATRICS

FIRST AND SECOND TERMS

Required Courses

- 103su. Clinic in Pediatrics. A part of course in required clinics. (17 hrs.; 5th yr.; Sec. 3, 4; W 8:30-10:00; Ancker Hospital.) Dr. Hagaman.
 103xsu. Same as 103su. (Sec. 1, 2; F 8:30-10:00.)
 104su. Clinic in Contagious Diseases. A part of course in required clinics. (17 hrs.; 5th yr.; Sec. 3; M 10:00-11:30; Minneapolis General Hospital.) Dr. Platou.
 104xsu. Same as 104su. (Sec. 1; W 10:00-11:30.)
 104ysu. Clinic in Contagious Diseases. A part of course in required clinics. (17 hrs.; 5th yr.; Sec. 4; M 10:00-11:30; Ancker Hospital.) Dr. Critchfield.
 104zsu. Same as 104ysu. (Sec. 2; W 10:00-11:30.)
 106su. Out-Patient Pediatric Clinic. Practical study of the diseases of children in the out-patient service. (50 hrs.; 6th yr.; Div. B; see special schedule; MTWThFS 10:30-12:00; UD.) Dr. Seham and others.
 107su. Clinical Clerkship in Pediatrics. The observation and study of patients in University Hospital; case histories; physical examinations and provisional diagnosis; treatment. Each student 6 weeks. (70 hrs.; 6th yr.; sections of Div. B; MTWThFS 8:30-10:30; UH.) Dr. Schlutz and others.
 107xsu. Same as 107su. (Daily 8:30-10:30; Minneapolis General Hospital.) Dr. Huenekens and others.
 108su. Infant Welfare Clinic. (6 hrs.; 6th yr.; Div. B in sections; T 1:30-2:30; Northeast Neighborhood House.) Dr. Platou.
 108xsu. Infant Welfare Clinic. (6 hrs.; 6th yr. Div. B in sections; Th 1:30-2:30; South Town Clinic.) Dr. Lippman.
 109su. Clinic in Pediatrics. Selected cases from the University Pediatric Dispensary. Complete résumé of cases including history; physical and laboratory findings; general discussion; diagnosis and treatment. Required of Div. B., elective for others. (17 hrs.; 5th and 6th yrs.; Th 3:30-5:00; UH lect. room.) Dr. Schlutz and others.

Elective Courses

- 111su. Diseases of the New-born and General Pediatrics. Four to ten students. (Cr. ar.; 5th and 6th yrs.; T 3:00-5:00 or ar.; Minneapolis Gen. Hosp.) Dr. C. A. Stewart.
 113su. Infant-Feeding Clinic. One to five students. (Cr. ar.; 5th and 6th yrs.; hrs. ar.; Pillsbury Settlement House.) Dr. C. A. Stewart.

- 115su. Clinical Research in Pediatrics. One to four students. Preparation of one paper suitable for publication required. (Cr. ar.; 5th and 6th yrs.; hrs. ar.; Minneapolis Gen. Hosp. and Lymanhurst.) Dr. C. A. Stewart.
- 200su. Advanced Study in Diseases of Infants and Children. (Cr. and hrs. ar.) Dr. Schlutz.
- 206su. Research in Pediatrics. (Ar.; 121MH.) Dr. Schlutz.

SURGERY

FIRST AND SECOND TERMS

Required Courses

- 59su. Diagnostic Clinic. Class clinics on the diagnosis of surgical conditions presented in the Out-Patient Department. (11 hrs.; jr. class; T 11:00-11:50; 129MH.) Dr. Johnson.
- 61su. Diagnostic and Operative Clinics. Sections 1 and 2 of Div. A, fifth year class; part of required clinics. (17 hours; M 10:00-11:30; Ancker Hospital.) Dr. Abbott.
- 61xsu. Same as 61su for Sec. 3 and 4 (F 10:00-11:30.) Dr. Colvin.
- 63su. Clinical Clerkship. Personal study of assigned patients; case histories; laboratory examinations; provisional diagnoses with suggestions as to therapy; attendance at operations and observation of post-operative management. Practical instruction in anesthesia. (200 hrs.; sr. class, sections of Div. D; prereq., Surgery 51 and 53; MTWThFS 9:00-12:00; UH.) Dr. Dunn.
- 63xsu. Same as 63su. (Minneapolis Gen. Hosp.) Dr. Zierold.
- 65su. Minor Surgery Clinics. Sections of class assigned daily to the Out-Patient Department; a part of required clinics. (25 hours; sr.; daily 10:30-12:00; see special schedule; Disp., MH.) Dr. Johnson, Dr. McKinney, Dr. Bratrud, Dr. Hayes.
- 71su. Orthopedic Clinic. In the Out-Patient Department; a part of required section clinics. (8 hrs.; sr.; MF 1:00-2:30; see special schedule; Disp., MH.) Dr. Giessler, Dr. Henry.
- 77su. Genito-Urinary Clinics. In the Out-Patient Department; a part of required section clinics. (25 hrs.; sr.; daily 1:00-2:30; see special schedule; Disp., MH.) Dr. Thomas, Dr. Kremer, Dr. Wethall.

Elective Courses

- 101su. Minor Surgery Assistantship. Limited to two students who have had surgical clerkship. (50 hrs.; sr.; MWF 10:30-12:00; Dis. MH.) Dr. Johnson, Dr. Hayes.
- 101xsu. Same as 101su. (TThS 10:30-12:00.) Dr. McKinney, Dr. Bratrud.
- 102su. Proctology; Assistantship in Proctology. A clinical course conducted in the Out-Patient Department. Two to four students. (33 hrs.; jr., sr.; MWF 10:30-11:30; Disp., MH.) Dr. Fansler.

- 105su. Bedside and Diagnostic Clinic. (12 hrs.; jr., sr.; W 9:00-10:30 (to Aug. 1); Minneapolis Gen. Hosp.) Dr. Corbett.
- 105xsu. Same as 105su. (F 9:00-10:30; Minneapolis Gen. Hosp.) Dr. Robitshek.
- 108su. Urologic Clinic. Two to four students. (50 hrs.; jr., sr.; MWF 1:00-2:30; Disp. MH.) Dr. Wethall.
- 108xsu. Same as 108su. (TThS 1:00-2:30.) Dr. Kremer.
- 111su. Orthopedic Clinic. Two to four students. (44 hrs.; jr., sr.; MF 1:00-2:30; Disp. MH.) Dr. Giessler, Dr. Henry.
- 114su. Urologic Diagnosis; Cystoscopy. Limited to two students who have had surgical clerkship. (44 hrs.; jr., sr., grad.; TTh 8:30-10:30; UH.) Dr. Thomas.
- 115su. Night Clinic in Urology (Venereal Diseases). (33 hrs.; jr., sr., grad.; MTh 7:00-8:30 p.m.; Disp. MH.) Dr. Wethall.
- 116su. Children's Orthopedic Clinic. Two to six students. (17 hrs.; jr., sr., grad.; W 8:30-10:00; Shriners' Hospital.) Dr. Reed, Dr. Cole.
- 117su. Urologic Clinic. Three to six students. (17 hrs.; jr., sr., grad.; F 9:00-10:30; Minneapolis Gen. Hosp.) Dr. Oscar Owre.

HOSPITAL

DIVISION OF ROENTGENOLOGY

First and Second Terms

- 79su. Roentgenology. Lectures. Sixth year medical students. (11 hrs.; T 3:00-3:50; 214MH.) Dr. Allison.
80. Plate-Reading. Arrange hours and credit.
81. X-Ray Technique. Arrange hours and credit.
82. X-Ray Therapy. Arrange hours and credits.

COLLEGE OF DENTISTRY

Courses in contributing departments are announced elsewhere in this bulletin. See particularly Anatomy, Bacteriology and Immunology, Chemistry, Pathology, Pharmacology, Physiology, and Metallography.

Fees: full time, \$40; half time, \$20 for each term.

In addition each student pays the following:

Minnesota Union or Shevlin Hall fee.....	\$0.50
Health fee	1.00
General deposit*	5.00

Courses in the Department of Dentistry as follows:

FIRST AND SECOND TERMS

21-22-23su. Sophomore Operative Technic. A course of lectures, recitations, demonstrations, and laboratory work, identical with the course offered during the regular session. Both terms must be taken before credit will be given for the course. (6 cr.; prereq., Oral Anatomy 11f-12w-13s; MTWThF 2:00-5:00.) Dr. Walls and associates.

Clinical Practice. Clinical work will be offered in each of the following divisions: Crown and Bridge Work, Oral Diagnosis, Operative Dentistry, Orthodontia, Prosthetic Dentistry, and Oral Surgery. (Jr., sr., grad.; MTWThF 9:00-12:00 a.m., 2:00-5:00 p.m.) Dr. Walls, Dr. Lasby, Dr. Brekhus, Dr. Griffith, Dr. Wells, and associates.

SECOND TERM

23su. Crown and Bridge Work. A technic course. Lectures, demonstrations, and laboratory work, including all the more important forms of crowns and bridges. (99 hrs.; 3 cr.; prereq., Oral Anatomy 11-12-13.) Dr. Reynolds, Dr. Wells, Dr. Hall, Dr. Lundquist, Dr. E. A. Nelson.

* For students who pay regular term fees in dentistry \$1 will be deducted from the general deposit fee to cover recreation.

THE SCHOOL OF CHEMISTRY

GENERAL INORGANIC CHEMISTRY

FIRST TERM

- 1su.¹ General Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. (4 cr.; no prereq.; lect., MTWThFS II; 325C; lab., MTWTh VI-VII; 210C.) Mr. Kirk.
- 4su.¹ General Inorganic Chemistry. A study of the general laws of chemistry and of the non-metals and their compounds. (4 cr.; prereq., high school chemistry; lect., MTWThFS II; 225C; lab., MTWTh VI-VII; 210C.) Mr. Stephens.
- 6su.¹ General Inorganic Chemistry. Includes a study of general laws of chemistry and of non-metals and their compounds. (5 cr.; no prereq.; lect., MTWThFS II; 325C; lab., MTWThF VI-VII; and TTh VIII; 210C.) Mr. Kirk.
- 9su.¹ General Inorganic Chemistry. A study of the general laws of chemistry and of non-metals and their compounds. (5 cr.; prereq., high school chemistry; lect., MTWThFS II; 225C; lab., MTWThF VI-VII; TTh VIII; 210C.) Mr. Stephens.
- 11su.² Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibrium, oxidation, and reduction, etc. (4 cr.; prereq., 3 or 5; lect., MTWThFS II; 111C; lab., MTWTh VI-VII; 290C.) Mr. Sneed.
- 12su.¹ Qualitative Chemical Analysis. Laboratory work in systematic qualitative analysis with lectures on solutions, ionization, chemical and physical equilibrium, oxidation, and reduction, etc. (5 cr.; prereq., 8 or 10; lect., MTWThFS II; 111C; lab., MTWThF VI-VII; TTh VIII; 290C.) Mr. Sneed.
- 17su.¹ Glass Blowing. Exercises in the more important operations in building chemical apparatus. (1 cr.; jr., sr., grad.; no prereq.; MWF VIII-IX.) Mr. Stephens.
- 19su. Teachers' Course. Consideration of the fundamental principles of chemistry with particular reference to the teaching of chemistry in high school. Discussion of such topics as training of the teacher, laboratory equipment, etc. (3 cr.; prereq., 13; lect., MTWThFS IV; 315C.) Mr. Geiger.
- 102su.¹ 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 cr.; prereq., 21; hrs. to be ar.) Mr. Sneed.
- 304su. Research in General Inorganic Chemistry. (Cr. and hrs. to be ar.) Mr. Sneed.

¹ A laboratory fee of \$1.50 is charged for this course.

SECOND TERM

- 2su.¹ General Inorganic Chemistry. A continuation of 1su. (4 cr.; prereq., 1; lect., MTWThFS II; 325C; lab., MTWTh VI-VII; 210C.) Mr. Maynard.
- 5su.¹ General Inorganic Chemistry. A continuation of 4su. (4 cr.; prereq., 4; lect., MTWThFS II; 225C; lab., MTWTh VI-VII; 210C.) Mr. Heisig.
- 7su.¹ General Inorganic Chemistry. A continuation of 6su. (5 cr.; prereq., 6; lect., MTWThFS II; 325C; lab., MTWThF VI-VII; TTh VIII; 210C.) Mr. Maynard.
- 10su.¹ General Inorganic Chemistry. A continuation of 9su. (5 cr.; prereq., 9; lect., MTWThFS II; 225C; lab., MTWThF VI-VII; TTh VIII; 210C.) Mr. Heisig.

ANALYTICAL CHEMISTRY

FIRST TERM

- 27su.¹ Quantitative Analysis. (Primarily for pre-medical students and teachers.) An introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. (4 cr.; prereq., qual. anal.; lect. or rec., TW V, VI; 315C; lab., MThF V-VIII; TW VII-VIII; 310C.) Mr. Geiger.
- 28su.¹ Quantitative Analysis. (Primarily for engineers, dentists, and miners.) A short introductory course covering the general principles and methods of quantitative analysis, both gravimetric and volumetric. Typical problems will be assigned and attention given to proper laboratory practice. (3 cr.; prereq., qual. anal.; lect. or rec., TW V, VI; 315C; lab., MTh V-VIII; TW VII-VIII; 310C.) Mr. Geiger.
- 324su. Research in Analytical Chemistry. (Cr. and hrs. to be ar.) Mr. Geiger.

ORGANIC CHEMISTRY

FIRST TERM

- 31su.¹ Elementary Organic Chemistry. Discussion of important compounds of aliphatic and aromatic series, and preparation of typical substances. This course is primarily for students in professional schools and is not equivalent to Course 35 for students registered in the School of Chemistry. (4 cr.; prereq., 11 or 12; lect., MTWThF I; 325C; rec., TTh II; 215C; lab., MWF II-IV; T III-IV; 390C.) Mr. Hunter.
- 138su.¹ Advanced Organic Chemistry Laboratory Work. Difficult preparations and problems. It is intended primarily to supplement the students' knowledge of the methods of organic chemistry. Students may also register for this course who desire appropriate laboratory work for other advanced courses. (2 to 5 cr.; prereq., 37; hrs. to be ar.) Mr. Hunter.

¹ A laboratory fee of \$1.50 is charged for this course.

- 191su. Advanced Organic Chemistry. An introduction to the literature of organic chemistry. May be accompanied by appropriate laboratory work in Chemistry 138. (3 cr.; prereq., 37; lect., MTWThF IV; 325C.) Mr. Hunter.
- 334su. Research in Organic Chemistry. (4 or 5 cr.; hrs. to be ar.) Mr. Hunter.

SECOND TERM

- 32su.¹ Elementary Organic Chemistry. A continuation of 31su. (4 cr.; prereq., 11 or 12 and 31; lect., MTWThF I; 325C; rec., TTh II; 215C; lab., MWF II-IV; T III-IV; 390C.) Mr. Lauer.

PHYSICAL CHEMISTRY

FIRST TERM

- 149su. Principles of Colloid Chemistry. A general survey of the field with especial emphasis on adsorption phenomena. (3 cr.; prereq., 8 cr. in physical chem.; lect., MTWFS III; 225C.) Mr. Freundlich.
- 155su. Recent Advances in Physical Chemistry. The topics discussed in this course will include crystal structure, atomic structure, and recent views on ionization of electrolytes. (3 cr.; prereq., 8 cr. in physical chem.; lect., MTWThF II; 315C.) Mr. Reyerson.
- 157su.¹ Colloid Chemistry Laboratory. Must be preceded or accompanied by Chemistry 149 or its equivalent. (Cr. and hrs. to be ar.) Mr. Reyerson.
- 250su. Seminar in Colloid Chemistry. (1 cr.; prereq., 149 or equiv.; 2 hrs. a week to be ar.) Mr. Freundlich.
- 344su. Research in Physical Chemistry. (Cr. and hrs. to be ar.) Mr. Reyerson.

TECHNOLOGICAL CHEMISTRY

FIRST TERM

- 167su.¹ Technical Gas and Fuel Analysis. (3 cr.; jr., sr., grad.; prereq., 20-21; lect. or rec., MW V; 215C; lab., MTWTh VI-VIII; 10C.) Mr. Harding.
- 168su.¹ Petroleum and Petroleum Products. (3 cr.; jr., sr., grad.; prereq., 20-21; lect. or rec., TTh V; 215C; lab., MTWTh VI-VIII; 10C.) Mr. Harding.
- 169su.¹ General Technical Analysis. Analysis of various industrial products including foods and food materials. (3 cr.; jr., sr., grad.; prereq., 20-21; lect. or rec., F V, VI; 215C; lab., MTWTh VI-VIII; 10C.) Mr. Harding.
- 364su. Research in Technological Chemistry. (Cr. and hrs. to be ar.) Mr. Harding.

¹ A laboratory fee of \$1.50 is charged for this course.

CHEMICAL ENGINEERING

FIRST TERM

- 174su.¹ Chemical Manufacture. (Inorganic.) Part of the summer practice required of juniors in Chemical Engineering during the summer between the third and fourth years; must be accompanied by Course 175su. (3 cr.; prereq., 171; MTWThFS ar.; ar.) Mr. Mann.
- 175su.¹ Chemical Manufacture. (Organic.) Similar to Course 174, but in the organic field. Part of the summer practice required of juniors in Chemical Engineering during the summer between the third and fourth years; must be accompanied by Course 174su. (3 cr.; prereq., 171; MTWThFS ar.) Mr. Montonna.
- 374su. Research in Chemical Engineering. (Cr. and hrs. to be ar.) Mr. Mann.

¹A laboratory fee of \$1.50 is charged for this course.

THE COLLEGE OF EDUCATION

For courses in other colleges accepted in the College of Education, see the bulletin of the College of Education.

ADMISSION

Regular Students

To be admitted to regular standing in the College of Education, students must be able to satisfy either of the following requirements, (a) or (b).

(a) Completion of at least the junior college requirements of the College of Science, Literature, and the Arts, or of some other approved college at the University of Minnesota or elsewhere, during which time an introductory course in general psychology shall have been pursued. No formal application is necessary for transfer from the Junior College to the College of Education if such transfer is made at the beginning of the junior year, nor is any loss of credits involved.

(b) The College of Education grants to graduates of the advanced graduate course of Minnesota state teachers' colleges 90 credits.

In special subjects like art education, physical education, public school music, etc., where a four-year curriculum is provided, students may register in the College of Education in the freshman year, provided they have completed the requirements for admission to the University. (See bulletin of general information, pages 24-25.)

Unclassed Students

a. The College of Education grants to graduates of the advanced Latin and the advanced English courses of the Minnesota state teachers' colleges 63 credits. These students will be admitted as unclassified until they have satisfied the requirements for junior standing.

b. Teachers preparing for examination for the first grade professional certificate, but who are unable to meet the regular requirements for admission are admitted to the College of Education as unclassified students. Each case must, however, be dealt with individually as the result of formal application to the dean.

c. Teachers in service unable to meet the regular requirements for admission are admitted to the College of Education as unclassified students. Each case must, however, be dealt with individually as the result of formal application to the dean of the College of Education.

For specific and detailed information concerning entrance requirements, consult the bulletin of the College of Education.

ADVANCED STANDING

By Examination

The College of Education distinctly discourages any effort to secure advanced standing in professional subjects by examination. With the

establishment of correspondence courses in the General Extension Division, there are no longer the reasons which formerly existed for granting such examinations.

*By Graduation from the Three-Year Course of
Minnesota State Teachers' Colleges*

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 at the University of Minnesota; credits earned in the three-year normal school course may be applied in case they are deemed of equivalent merit, in the College of Education, to courses leading to certificates for supervisors in elementary grades, as principals in state graded schools, as teachers in junior high schools or in normal school departments in high schools; students coming from the three-year course in normal schools shall not receive certificates in high school subjects from the University without completing the prescribed courses of the University of Minnesota for such certificates.

Students admitted to the College of Education from state teachers' colleges will not be permitted to elect the following courses for credit: Education 1; Psychology 1-2. Such students will be required to carry the advanced course in History of Education.

For a statement of records to be submitted, see bulletin of general information, pages 33-34.

By Credentials from Other Colleges

Advanced standing in the College of Education by the presentation of credentials from other colleges of the University of Minnesota or colleges of similar grade elsewhere may be secured only upon petition to the faculty of the College of Education. Students may shorten the two years of residence only by meeting such additional requirements in quality and quantity of professional work as in the opinion of the faculty will make the training of such students equal to that of students regularly registered for two full years in the College of Education.

*Prescribed Course of Study for University Teacher's Certificate in a
Secondary School Subject*

The College of Education has adopted the following prescribed course of study, totaling 25 credits, for the University teacher's certificate, and for the degree of bachelor of science.

1	Brief Course in History of Education.....	5 credits
	or	
101-102-103	History of Education	9 credits
3	Educational Sociology	3 credits
55	Elementary Educational Psychology.....	3 credits
15	Technique of High School Instruction.....	3 credits
65	The High School	3 credits
16	Practice Teaching	5 credits
	Special Methods	at least 3 credits

The following courses must be taken in the order named, each being regarded as a prerequisite to all the courses which follow it:

Educational Psychology 55

Technique of Teaching 15

Special Methods

Practice Teaching 16

In addition to the teachers' course in the subject in which the student wishes to do practice teaching, he will be required to satisfy all courses required by the subject-matter department concerned as prerequisite to the teachers' course. (See departmental statements in College of Education bulletin.)

Exceptions

(1) Students already holding a first grade professional certificate may be excused from complying with the requirements for the University teacher's certificate but in every case students will be required to carry the minimum number of professional courses required for qualifying for a certificate.

(2) Students preparing to pursue school work but not in need of a teacher's certificate may qualify for the degree of bachelor of science without meeting the professional requirements for any particular certificate. In every case, however, students must petition for this privilege and will be required to earn 36 or more credits in a major field and to meet a minor requirement in at least one minor field.

Graduate students.—Students wishing to work upon problems immediately concerned with the writing of a graduate thesis are advised to consult with the dean of the College of Education.

GENERAL COURSES

208su. Methods in Educational Research. A study of the methods employed in treatment and presentation of educational problems. Designed to aid students in the preparation of theses. Suggested for all candidates for degrees. (2 cr.; TWThF VI; 206Ed.) Mr. Haggerty.

AGRICULTURAL EDUCATION

FIRST TERM

82su.† 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. (3 to 10 cr.; prereq., 81; ar.) Mr. Storm.

141su. Supervised Practice in Vocational Agriculture. A special methods course dealing with the selection, planning, supervising, and summarizing

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

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. (3 cr.; prereq., 11; MTWThFS II; 317Ad(F).) Mr. Field.

- 171su. Problems in Procedure. Course for teachers of agriculture. Emphasis on working out problems in detail so the processes as formulated can be used in the teaching of the following year by those enrolled. Discussions, readings, reports, laboratory. (3 cr.; prereq., 131, 42, or equiv.; MTWThFS IV; 317Ad(F).)
- 224su. Graduate Problems. Making investigations, gathering data, and formulating plans regarding agricultural education. (Ar.; ar.) Mr. Field, Mr. Storm.

ART EDUCATION

FINE ARTS

- 29su. Fundamental Principles of Design. Elementary problems involving space-breaking with parallel lines; subdivision of rectangular spaces; emphasis on value relations in bounded spaces and surfaces; applications to problems developed in the handicraft courses. (1 cr.; no prereq.; lect., MWF I; lab., MWF II; 402F.) Mr. Hilpert.
- 32-33-34Asu. Still Life. Drawing from objects in charcoal and pencil. Emphasis on value relations, form, and perspective (1 cr.; no prereq.; MWF; Sec. 1, III; Sec. 2, IV; 402F.) Mr. Hilpert.
- 32-33-34Csu. Sketch Drawing. From the posed figure in charcoal and pencil. Action and memory drawings; emphasis on action, form, and value relation. (1 cr. each; no prereq.; TThS; Sec. 1, lect., I; Sec. 2, lect., V; lab., II, III and 1 hr. ar.; 402F.) Mr. Hilpert.
- 55su.¹ Fundamental Art Principles. A course for grade teachers and for teachers of academic subjects in high schools who wish to see the bearing of art on their work. Lectures, notebooks with three hours a week of laboratory work. (1 cr.; no prereq.; TThS IV; 402F.) Mr. Hilpert.

CRAFTS

- 36Asu. Cardboard and Paper Construction. Boxes, toys, furniture, and other public school problems. (1 cr.; no prereq.; MWF, lect., Sec. 1, VI; Sec. 2, VIII; lab., VII; 404F.) Miss Sutorius.
- 37su. Elementary Basketry. Reed and raffia, splint, pine needles, caning, and native grasses and other native materials. (1 cr.; no prereq.; TTh VI, VII, (VIII*); Sec. 1, lect., VI; Sec. 2, lect., VII; 406F.) Miss Sutorius
- 38su. Allied Crafts. Elementary weaving, hand looms, simple Indian and colonial rugs of our own country. Bead work, chains, bands, belts, and bags. Knot work, bags, ropes, tennis nets, hammocks, etc. (1 cr.; no prereq.; MW VI, VII, (VIII*); Sec. 1, lect., VI; Sec. 2, lect., VII; 406F.) Miss Sutorius.

¹ A laboratory fee of \$1.50 is charged for this course.

* The eighth hour is for laboratory work only.

- 39su. Advanced Reed Work. Principles of simple furniture, including fireside baskets, floor lamps, tables, bookcases, and chairs, and the more advanced basket weaves. (2 cr.; prereq., 37 or equiv.; MW VI, VII, (VIII*); lect., VI; 404F.) Miss Ross.
- 40su. Advanced Weaving. Table and foot power looms. Sequence of problems from the simple hand loom to the threading and use of the four harness foot power loom. (2 cr.; prereq., 38su. or equiv.; TTh VI-VII, lect., VI.) Miss Ross.
- 41su. Elementary Pottery. Simple problems in clay, cement, and clay substitutes. Students will be given the opportunity to make and apply simple glazes and to observe the packing and firing of the kiln. (2 cr.; no prereq.; MW lect. VI; (VII), (VIII*)). Miss Rose.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

FIRST TERM

- 65su. The High School. For high school teachers in training. Recent growth in secondary education; types of reorganization; types of programs of study; types of high schools; plant; costs; standardization. (3 cr.; jr., sr.; prereq., Ed. 55; MTWThFS IV; 208OL.) Mr. Powers.
- 113su. High School Curriculum. A study of types of programs of study, curricula, subjects of study, constants, variables, electives, distribution of subject-matter by years and units. (3 cr.; jr., sr., grad.; prereq., Ed. 1, 3; MTWThFS IV; 215Ed.) Mr. Hudelson.
- 115su. Practice in Supervision. Problems and practice in the supervision of instruction in the elementary schools of Minneapolis and St. Paul. (2 cr.; sr., grad.; MTWF I; 206Ed.) Mr. Brueckner.
- 119su. Elementary School Curriculum. A study of the scientific principles underlying curriculum-making. Consideration will be given to a study of the results of scientific investigation in the various fields of the elementary school curriculum both as to content and organization. (3 cr.; sr., grad.; prereq., Ed. 1, 3; MTWThFS V; 205Ed.) Mr. Hartwell.
- 121su. 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. (3 cr.; MTWThFS IV; 206Ed.) Miss Blitz.
- 124su. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. (3 cr.; sr., grad.; prereq., 10 hours in educ.; MTWThFS V; 204Ed.) Mr. Selke.
- 125su. City School Administration. For superintendents and principals. Detailed study of the principles and practice of city school administration. (3 cr.; sr., grad.; prereq., Ed. 124; MTWThFS I; 205Ed.) Mr. Engelhardt.

* The eighth hour is for laboratory work only.

- 157su. Administration and Supervision of Rural Schools. Problems of organization, curriculum, finance; function of supervision of one-room and consolidated schools. (3 cr.; jr., sr., grad.; MTWThFS I; 111Ed.) Mr. Selke.
- 160su. Principles of Supervision. An analysis of the functions and duties of a supervisor as related to the improvement of instruction; specific supervisory technique; objective analysis of classroom activity; concrete application of present-day problems; case studies. (3 cr.; sr., grad., prereq., Ed. 15 or equiv.; MTWThFS IV; 205Ed.) Mr. Hartwell.
- 161asu.¹ Supervision: Uses of Educational Tests in Improving Instruction. Objective evaluation of the results of teaching; classification of pupils on basis of educational tests; diagnosis of pupil difficulty; remedial work; tests as aids to teaching. (2 cr.; sr., grad.; prereq., Ed. 15 or equiv.; MTWF IV; 204Ed.) Mr. Brueckner.
- 161bsu. Elementary School Supervision. The adjustment of the curriculum to the abilities of pupils in the elementary school; methods of classifying pupils according to achievement and intelligence. (3 cr.; prereq., Ed. 15 or equiv.; MTWThFS II; 205Ed.) Mr. Horn.
- 167su. Junior High School. A study of the special purposes of this institution and the appropriate reorganization to achieve them; the history of the movement. (3 cr.; sr., grad.; prereq., Ed. 1, 3; MWF VII-VIII; 205Ed.) Mr. Powers.
- 175su. City School Finance. Analysis of unit costs on various bases; comparative cost accounting systems, budgets, financial records, and reports. (3 cr.; sr., grad.; prereq., Ed. 124-125; MTWThFS II; 111Ed.) Mr. von Borgeersode.
- 178su. 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. (3 cr.; sr., grad.; MTWThFS II; 204Ed.) Mr. Spencer.
- 188su. 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. (1 cr.; prereq., Ed. 124-125-126; ar.; ar.) Mr. Engelhardt.
- 205su. Seminar in Educational Administration. (2 cr.; grad.; prereq., Ed. 124-125-126, 160-161-162; MTWF III; 111Ed.) Mr. Engelhardt.

SECOND TERM

- 119su. Elementary School Curriculum. A study of the scientific principles underlying curriculum-making. Consideration will be given to a study of the results of scientific investigation in the various fields of the elementary school curriculum both as to content and organization. (3 cr.; sr., grad.; prereq., 1, 3; MTWThFS I; 205Ed.) Mr. Selke.

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

- 124su. Educational Administration. The present status and tendencies in the organization and administration of state and city school systems with interpretations. (3 cr.; sr., grad.; prereq., 10 hrs. in educ.; MTWThFS II; 206Ed.) Mr. Engelhardt.
- 126su. City School Administration. Advanced problems in financial accounting, pupil accounting, school-building programs, and school publicity. (3 cr.; sr., grad.; prereq., Ed. 125; MTWThFS I; 206Ed.) Mr. Engelhardt.
- 128su. 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. (1 cr.; prereq., Ed. 124-125-126; ar.; ar.) Mr. Engelhardt.
- 133su. The Administration of Educational and Vocational Guidance. Designed to cover the administrative phases of the guidance movement, the use of tests to determine educational and vocational aptitudes, methods of gathering and imparting vocational information, and the technique of vocational counselling. (3 cr.; MTWThFS V; 206Ed.) Mr. Proctor.
- 162asu. 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. (3 cr.; sr., grad.; prereq., 15 or equiv.; MTWThFS II; 205Ed.) Mr. Selke.
- 164su. Problems of High School Administration. A study of elimination from school, secondary vocational education, the marking system, classification of students, high school library, social organization and extra-curricular activities, community relationships, teaching schedule, building, costs. (3 cr.; sr., grad.; prereq., 10 hrs. in educ.; MTWThFS IV; 206Ed.) Mr. Proctor.
- 174su. Public School Finance. A critical study of problems of federal and state aid to public schools; sources, methods, principles, needed reforms. Students are strongly advised to take as preparatory or in conjunction with this course City School Finance (Ed. 175). (2 cr.; sr., grad.; MTWThFS III; 111Ed.) Mr. von Borgersrode.

EDUCATIONAL PSYCHOLOGY

FIRST TERM

- 55su. Educational Psychology. A survey of fundamental facts of human behavior involved in educational activities. Open to juniors and seniors. (3 cr.; jr., sr.; prereq., 6 cr. in psych.; MTWThFS I; Law Aud.) Mr. Bohan, Mr. Turney.
- 107su. Advanced Educational Psychology. Advanced work in genetic psychology, origin and nature of human organism, development and control of instincts. Methods of measuring rate of learning; study of typical

- learning experiments. Study of group and individual differences, and their relations to educational practice. (3 cr.; jr., sr., grad.; prereq., Ed. 55 or equiv.; MTWThFS I; Psy. Lab.) Mr. Van Wagenen.
- 111su.¹ Educational Diagnosis. The typical educational problems involving educational scales and standard tests. Nature of tests, methods of use, analysis of results obtained, and programs of remedial educational procedure based on the results of the tests. (3 cr.; jr., sr.; prereq., Ed. 55 or equiv.; MTWThFS II; Psy. Lab.) Mr. Van Wagenen.
- 116su. Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. (3 cr.; sr., grad.; prereq., Ed. 55; MTWThFS I; 204Ed.) Mr. von Borgerstrode.
- 134su.¹ Mental Tests. Study of mental variation in children, its nature, degrees, causes, and effects. A laboratory course in the study of individual differences by means of mental tests. A critical study of group tests. Methods of treating superior and subnormal children in schools. (2 cr.; jr., sr., grad.; prereq., Ed. 55; Sec. 1, MTWF II, III; Sec. 2, MTWF III-IV; Law Aud.) Mr. Paterson, Mr. Bohan.
- 143su.¹ 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. (3 cr.; jr., sr., grad.; prereq., Ed. 55 or equiv.; ar.) Mr. Rockwell, Mr. Turney.
- 149su.¹ Psycho-Educational Clinic. Conducted in co-operation with the Department of Sociology and the Medical School clinics in pediatrics and nervous and mental diseases. Students will receive systematic instruction in giving psychological examinations and in scientific interpretation of data. (3 cr.; jr., sr., grad.; prereq., Ed. 134-135-136 or equiv.; VII-VIII; ar.) Mr. Rockwell.
- 192su. The Psychology of Behavior Problems in Children. Survey of the field. Polyphase nature of the causative factors. Conditioning factors in the environment. Psychological and psychiatric interpretations. Presentation of clinic studies. (2 cr.; prereq., Ed. Psych. 55 or equiv.; MTWF I; 210OL.) Miss Goodenough.

SECOND TERM

- 55su. Educational Psychology. (For course description, see First Term, Course 55.) (3 cr.; jr., sr.; prereq., 6 cr. in psych.; MTWThFS I; 204Ed.) Mr. Bohan.
- 116su. Statistical Methods in Education. A study of statistical methods as applied to educational investigation. This course is ordinarily required of all candidates for advanced degrees. (3 cr.; sr., grad.; prereq., 55; MTWThFS IV; 111Ed.) Mr. von Borgerstrode.

¹ A laboratory fee of \$1.50 is charged for this course.

- 135su.¹ Mental Tests. (For course description, see First Term, Course 134.) (2 cr.; jr., sr., grad.; prereq., 55 or equiv.; MTWF II, III; 211Psy.) Mr. Rockwell, Mr. Bohan.
- 154su. Research Problems. Intended for properly prepared students who desire to pursue special investigation in the field of educational psychology. (1 cr.; sr., grad.; prereq., consent of instructor; ar.) Mr. Rockwell.
- 191su. Systematic Educational Psychology. Advanced course covering the field of psychology as related to education. Open to seniors and graduate students. Not open to students who receive credit for Educational Psychology 106-107-108. (3 cr.; sr., grad.; prereq., 12 cr. in psych. and ed. psych.; MTWThFS V; 301Psy.) Mr. Rockwell.

HISTORY AND PHILOSOPHY OF EDUCATION

FIRST TERM

- 3su. Educational Sociology. A study of education as a means of solving social problems and directing the evolution of institutions. (3 cr.; jr., sr.; prereq., 6 cr. in psych.; MTWThFS IV; 111Ed.) Mr. Chapin.
- 101su. 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. (3 cr.; jr., sr., grad.; prereq., 6 cr. in psych. and 6 cr. in hist.; MTWThFS V; 208OL.) Miss Alexander.

SECOND TERM

- 103su. 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. (3 cr.; jr., sr., grad.; prereq., 6 cr. in psych. and 6 cr. in hist.; MTWThFS II; 210OL.) Miss Alexander.
- 3su. Educational Sociology. A study of education as a means of solving social problems and directing the evolution of institutions. (3 cr.; jr., sr.; prereq., 6 cr. in psych.; MTWThFS V; 205Ed.) Mr. Finney.
- 103su. History of Modern Elementary Education. (For course description, see First Term, Course 103.) (3 cr.; jr., sr., grad.; prereq., 6 cr. in psych. and 6 cr. in hist.; MTWThFS IV; 205Ed.) Mr. Troxel.

HOME ECONOMICS EDUCATION

FIRST TERM

- 42su.² Special Methods of Teaching Home Economics. Curricula, equipment, methods of teaching for home economics. Actual class work illustrating principles of teaching. (5 cr.; jr., sr.; prereq., H.E. 13, 22, Psych. 1-2; Agr. Ed. 11 or Ed. Psych. 55; MTWThF VII, VIII; 213HE.) Miss Coon.

¹ A laboratory fee of \$1.50 is charged for this course.

² Prerequisites waived for teachers of home economics.

- 141su.¹ Problems in Home Economics Education. Problems of administration and supervision of home economics, study of curricula for the day, part-time, and evening schools, consideration of the home project and related work. (2 cr.; sr.; prereq., 42; MTThF IV; 213HE.) Miss Coon.

PHYSICAL EDUCATION FOR MEN

Credit for courses taken in the Summer Session will be given toward a regular teacher's certificate in Physical Education where the courses are included in the Physical Education major.

The gymnasium, tennis courts, baseball diamond, and running track will be available to students at all times except on Sundays.

A summer school baseball team will be organized and will play games with outside teams. All men are eligible to membership on the team.

Courses 1su and 2su in the Department of Physical Education for Women are open to men.

COURSES

First Term

- A. General Exercise. Volley-ball, baseball, handball, playground ball, basketball, tennis, golf, horseshoes, gymnastic games. No registration required. Open to students and faculty. (No cr.; no prereq.; all; MTWThF IX; A.) Mr. Smith.
- B. General Swimming. No instruction. No registration required. (No cr.; no prereq.; all; MTWThF, Sec. 1, V; Sec. 2, IX; Sec. 3, X; A.) Mr. Thorpe.
13. Elementary Swimming. Individual instruction for those who cannot swim. (No cr.; no prereq.; all; MTWThF; A.) Mr. Thorpe.
14. Intermediate Swimming. Individual instruction given. (No cr.; no prereq.; all; MTWThF VII; A.) Mr. Thorpe.
15. Advanced Swimming. For teachers and coaches. Instruction in form and speed swimming, diving, plunging, water sports, life-saving. (1 cr.; no prereq.; soph., jr., sr.; MTWThF VIII; A.) Mr. Thorpe.
17. School Gymnastics. Tactics, free exercise, tumbling and apparatus work, suitable for upper grades and high schools, in the school room and in the gymnasium. (1 cr.; no prereq.; jr., sr.; MTWThF IV; A.) Mr. Taylor.
19. Playground and Gymnasium Games. Lectures on the place of play in education, on organization and supervision of competitive athletics, rules, theory, form and methods of coaching playground ball, baseball, basket-ball, tennis, volley-ball, handball, dodge-ball, soccer, tumbling, track athletics. (1 cr.; no prereq.; soph., jr., sr.; MWF VI; A.) Mr. Iverson, Mr. Smith.
20. Playground Supervision. Open also to women. Practice coaching and supervising with a group of forty junior high school boys. (1 cr.; no prereq. if taken with Course 19; soph., jr., sr.; MTWThF Sec. 1, VII; Sec. 2, VIII; Sec. 3, IX; A.) Mr. Iverson, Mr. Taylor, Mr. Smith.

¹ Prerequisites waived for teachers of home economics.

23. Technique of Gymnastic Teaching. Lectures and quizzes on terminology and methods of teaching. (1 cr.; no prereq.; jr., sr.; MW II; A.) Mr. Taylor.
25. Organization and Administration of Intramural Athletics. Lectures on the best ways of handling intramural units in competition. Discussion of awards, participation, schedule-making, etc. Practice in conducting intramural schedules with summer school students. (1 cr.; no prereq.; all; TTh VII.) Mr. Smith.
26. Orthopedic Gymnastics. Lectures on the theories governing the correction of defects of form, posture, etc. Practice in handling classes and in executing the various movements. (1 cr.; no prereq.; all; TThS I.) Mr. Iverson.
27. Winter Sports. Lectures on rules, styles of play, and technique of hockey. Discussions of the theory of figure and speed skating, skiing, and other winter sports. (1 cr.; no prereq.; all; MWF VI.) Mr. Iverson.
34. Physical Education in the Public Schools. Aims and scope of physical education in the schools. Comparative value of different activities; activities suitable to different ages, sexes, and varying conditions. Problems of organization, administration, and supervision. Open also to women. (2 cr.; no prereq.; jr., sr.; TWThF VII; A.) Mr. Keller.
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; awards. (1 cr.; no prereq.; jr., sr.; TS III; A.) Mr. Finger.
37. Football. Lectures on history, rules, and theory, strategy, and 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 position, play, and the mechanics of football fundamentals. (3 cr.; no prereq.; sr.; MWF II, III; A.) Mr. Spaulding, Mr. Finger.
38. Basket-Ball. Lectures on rules, styles of offense and defense, the conditioning and handling of a team. Practice in fundamentals of footwork, passing, dribbling, goal throwing, etc. (2 cr.; no prereq.; sr.; TThS I, II; A.) Mr. Taylor.
39. Track Athletics. Instruction and practice in the standard track and field events. Lectures on conduct of meets, rules of competition, officiating, track strategy, regulation of practice, and preparing contestants for competition. (2 cr.; no prereq.; sr.; MTWThF IV; A.) Mr. Finger.
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. (2 cr.; no prereq.; sr.; MWF VII, VIII; A.) Mr. Keller.

See also Courses 1su and 2su in Physical Education for Women.

Second Term

- A. General Exercise. See Course A above. (No cr.; all; MTWThF IX; A.) Mr. Taylor.
- B. General Swimming. No instruction. No registration required. (No cr.; no prereq.; all; MTWThF Sec. 1, IX; Sec. 2, X; A.) Mr. Thorpe.
13. Elementary Swimming. See Course 13 above. (No cr.; no prereq.; all; MTWThF VIII; A.) Mr. Thorpe.
14. Intermediate Swimming. See Course 14 above. (No cr.; no prereq.; all; MTWThF VII; A.) Mr. Thorpe.
17. School Gymnastics. See Course 17 above. (1 cr.; no prereq.; jr., sr.; MTWThF VI; A.) Mr. Taylor.
23. Technique of Gymnastic Teaching. See Course 23 above. (1 cr.; no prereq.; jr., sr.; TTh IV; A.) Mr. Taylor.
38. Basket-Ball. Four weeks' course. See Course 38 above. (2 cr.; no prereq.; sr.; MTWF VII, VIII; A.) Mr. Taylor.

PHYSICAL EDUCATION FOR WOMEN

The tennis courts will be available to university women at all times except on Sundays.

For hours when the swimming pool will be open for general use, see Course 31.

A model recreation hour for girls of junior high school age will be in operation VIII MWF in the field adjacent to the Women's Gymnasium. Visitors will be welcome.

Courses 20 and 34 in the Department of Physical Education and Athletics are open to women.

Home Economics, 19su, Nutritional Aspects of Health, will be offered in the Women's Gymnasium by Dr. Jane Leichsenring MTWTh VI.

The program for this course will be included by the Home Economics Division in their part of the bulletin.

Except for Courses 32, 33, 34, in which shower bath fees are charged, students may procure shower bath tickets from the matron at fifteen cents apiece or at the rate of ten for one dollar.

COURSES

First Term

- 1su. Teachers' Course in School Room Gymnastics and Games. Open also to men. The technique is planned to help both those who are and who are not accustomed to some other method. The practical part of the course will include some of the recent innovations in gymnastics. (2 cr.; no prereq.; MTWFS II-III; 201, 153WGm.) Miss Baker.
- 2su. Teachers' Course in Play. Open also to men. Brief consideration of the nature and function of play, and adaptation to various groups of children; technique, rules and practice of games for Grades I-VI and girls of junior high school age; observation and practice teaching on

- playground. This course carries university credit for Physical Education 43-44-45 if preceded by specified prerequisites. (3 cr.; no prereq.; TWThFS I; MTWThF VII-VIII; 201, 151WGm.) Miss Campbell, Miss Hodgson.
- 3su. 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. This course carries university credit for Physical Education 13 or 66 if preceded by specified prerequisites. (1 cr.; no prereq.; MTWFS IV; 153WGm.) Miss Baker.
- 4su. Teachers' Course in Highly Organized Games. Graduated games leading to basket-ball, indoor baseball, volley-ball, soccer; technique and methods of teaching. (1 cr.; no prereq.; MTWThFS IV; 151WGm.) Miss Campbell.
- 31su. General Swimming. No registration necessary. (No cr.; no prereq.; WF 12:00; TTh VIII; 51 WGm.) Miss Campbell, Mrs. Foote.
- 32su. Elementary Swimming. Class instruction given. Shower bath fee \$1.50. Sections limited to 25. (No cr.; prereq., phys. exam.; Sec. 1, MWF III; Sec. 2, MWF IV; Sec. 3, TThS IV; Sec. 4, MWF IV½; Sec. 5, MWF VII; Sec. 6, MWF VII½; 51WGm.) Miss Campbell, Mrs. Foote.
- 33su. Intermediate Swimming. Class instruction given. Shower bath fee \$1. (No cr.; all; prereq., swim. exam., phys. exam.; TTh VII; 51WGm.) Mrs. Foote.
- 34su. Advanced Swimming. Class instruction given. Shower bath fee \$1. (No cr.; all; prereq., swim. exam., phys. exam.; TTh VII½; 51WGm.) Mrs. Foote.
- 35su. Teachers' Course in Swimming. Not offered in 1925.

Second Term

The swimming pool will be open for general swimming without instruction TTh 12 to 12:30 and MWF VII.

PUBLIC HEALTH

For courses in Preventive Medicine and Public Health, see Medical School, page 72.

PUBLIC SCHOOL MUSIC

13su.¹ Class Instrument-Teaching. Three classes, string, wood winds, and brass and percussion. Students may enter any or all classes. The course will contain drills, methods, and material for use in class instrument-teaching in the public schools. (1 cr. each; TS, strings, II; wood winds, III; brass, IV; 3Mu.) Mr. Pepinsky.

¹ The three subjects may be taken concurrently.

- 75su. Public School Music for the Grades. Grade methods. (3 cr.; MWF I-II; Mu.) Mr. Woods.
- 78su. Public School Music for High Schools. (3 cr.; prereq., 75; MWF III-IV; Mu.) Mr. Woods.

THEORY AND PRACTICE OF TEACHING

FIRST TERM

- 7su. Children's Literature. Acquaintance with graduation and adaptation of literature to children's interests in the school room and at home; bases of selection, materials for expressive and extensive reading; examination and evaluation of materials. (3 cr.; jr., sr.; no prereq.; MTWThFS I; 202Ed.) Miss Kilgore.
- 14su. 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. (2 cr.; jr., sr.; prereq., Ed. 15; TWThF VI; 113Ed.) Mr. Haertter.
- 15su. Technique of High School Instruction. Types of classroom exercises; preparation of teaching plans; hygiene of instruction; methods of treating individual differences; classroom management; professional ethics of teaching; supervised study; marking system; observation of high school work. (2½ cr.; prereq., Ed. 55; MTWFS III; 204Ed.) Mr. Marshall.
- 16su. Practice Teaching. Teaching under supervision in the Minneapolis city schools, in regular secondary school subjects. (5 cr.; sr., grad.; prereq., Ed. 15 and Special Methods Course; ar.) Miss Smith.
- 17su. Practice Teaching. A practice course in teaching subnormal children. Students will have opportunity to observe work with the special classes, and to teach under direction of the instructor. Conducted in co-operation with the public schools of Minneapolis and St. Paul. (2½ cr.; jr., sr.; MTWFS II, III, IV; ar.) Miss Bryne.
- 21asu. Teachers' Course in English Composition. (2 cr.; jr., sr.; prereq., Ed. 15; TWThF VII; 206Ed.) Miss Inglis.
- 21bsu. Teachers' Course in English Literature. (2 cr.; jr., sr.; prereq., Ed. 15; TWThF VIII; 206Ed.) Miss Inglis.
- 22su. Teachers' Course in French. Methods of teaching French in high schools, courses of study, textbooks, etc. Lectures, observations, and reports. Open to juniors and seniors qualifying for a certificate to teach French as a major or minor subject. Credit in education only. (3 cr.; jr., sr.; prereq., 13-14-15 and 1 conv. comp. course, 1 literary course, and Ed. 15; MWF VI-VII.) Miss Violet.
- 37su. 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. (3 cr.; jr., sr.; prereq., in each of the following: pol. sci., econ., sociol., either American History or Modern European History and Ed. 15; MWF VI-VII; 112Ed.) Mr. Tohill.

- 38su. *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. (3 cr.; jr., sr.; prereq., consult instr.; MWF VI-VII; 8Ed.) Mr. Smith.
- 42su. *Fundamental Educational Theories Related to Instruction in the Elementary School.* A study of current educational concepts as related to problems in the elementary school. Not open to those who have had Ed. 160. (2½ cr.; jr., sr.; MTWFS III; 205Ed.) Miss Kilgore.
- 43su. *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. (3 cr.; jr., sr.; MTWThFS II; 202Ed.) Miss Kilgore.
- 51su. *The Teaching of English in the Junior High School.* Practical methods for classroom presentation of literature and composition in the junior high school. Projects in composition and literature. Group method for large classes. Place of grammar, punctuation, spelling. Survey of the literature on the subject. (2 cr.; TWThF VI; 202Ed.) Miss Smith.
- 54su. *Teaching Secondary School Mathematics.* For students preparing to become teachers of secondary school mathematics. Lectures, readings, discussions, methods of presenting courses of study in general mathematics, algebra, and geometry. (4 cr.; jr., sr.; prereq. Ed. 15; Math. 50; MTWF VII, VIII; 113Ed.) Mr. Haertter.
- 56su. *Teachers' Course in History.* Deals chiefly with the practical problems of teaching history and government in the secondary schools. (3 cr.; jr., sr.; prereq., Ed. 15, 18 cr. in hist. including one intensive course; MTWThFS IV; 111OL.) Mr. Krey, Mr. Tohill.
- 137su. *The Education of Exceptional Children.* The adaptation of the curriculum and methods of teaching to the needs of special groups of children, the blind, the crippled, the superior, etc. (3 cr.; MTWThFS I; 202Ed.) Mr. Horn.
- 181su. *Technique of Elementary School Instruction.* Advanced course for teachers with experience in fundamental methods of teaching elementary school subjects. (3 cr.; jr., sr.; prereq., Ed. 55; MTWThFS V; 112Ed.) Mr. Spencer.
- 193su. *Foundations of Secondary School Methods.* A study of the investigations which form the bases of the technique of high school instruction, and the application of their results to high school subject-matter and to high school classroom procedure. (2 cr.; sr., grad.; prereq., Ed. 15; TWThF V; 111Ed.) Mr. Hudelson.
- 222su. *Research Problems in Technique of Instruction in Secondary Subjects.* (1 cr.; grad.; prereq., Ed. 15 and 113; ar.) Mr. Hudelson.
- 225su. *Seminar in Elementary School Problems.* (2 cr.; MTWF II; 112Ed.) Mr. Brueckner.

SECOND TERM

15su. *Technique of High School Instruction.* Types of classroom exercises; preparation of teaching plans; hygiene of instruction; methods of treating individual differences; classroom management; professional ethics of teaching; supervised study; marking systems; observation of high school work. (3 cr.; prereq., 55; MTWThFS II; 204Ed.) Mr. Marshall.

TRADE AND INDUSTRIAL EDUCATION

FIRST TERM

- Ind.20su. *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. (2 cr.; no prereq.; MTWF III; Ed. 112.) Mr. Tohill.
- Ind.25su. *Literature of Vocational Education.* Acquaintance and methods of use. Survey of useful books, periodicals, reports, and bibliographies. Students made familiar with reference facilities. Individual term assignments prepared under guidance, to teach sources, organization, and the writing of papers. (2 cr.; no prereq.; TWThF II; 208OL.) Mr. Smith.
- Ind.30su. *Graphic Presentation.* Study of typical methods of graphic representation of data. The use of educational and social materials for drill in the interpretation and statement of facts and conditions. Particular application in school situations and in the reports of studies. (2 cr.; no prereq.; TWThF IV; 206OL.) Mr. Smith.
- Ind.41su. *Job Analysis.* Relation to occupational analysis. Jobs reduced to operations. These examined for skills, physical demands, information, time study, fatigue and safety factors, and teaching order. Individual work, under guidance, within any field familiar to a student. Class criticism. (2 cr.; prereq., Ind.40; TWThF I; 208OL.) Mr. Bass.
- Ind.60su. *Social Agencies in Education.* An evaluation of various social agencies that make educational contributions; their status, aims, achievements, and deficiencies; their relationships and possible fields of cooperation. The special significance of social agencies to vocational education under public support and control. (2 cr.; no prereq.; MTWThF IV; 210OL.) Mr. Prosser.
- Ind.61su. *Social Significance of Industrial Education.* A study of the basic facts of economics and sociology which support efforts in the organization and administration of industrial education. Review of the movements which contributed to its introduction and development. Its social value and results. (2 cr.; prereq., Ind. 60; MTWF III; 210OL.) Mr. Prosser.

- Ind80su. General Industrial Training. Organization and supervision of the industrial courses for grades and high schools 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. Report of a recent survey of 65 selected schools. (2 cr.; no prereq.; TWThF I; 206OL.) Mr. Smith.
- Ind.171su. 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. (2 cr.; jr., sr., grad.; TWThF II; 206OL.) Mr. Craigo.
- Ind.10su.¹ Teachers' Course in Elementary Wood Work. This course is primarily a methods course. A very important part of the course is demonstration work by the students. The course also involves uses and care of tools, tool processes, and uses and care of wood-working machinery. (2 cr.; no prereq.; MTWF II, III; 24Ed.) Mr. Stockwell.
- Ind.11su.¹ Teachers' Course in Primary Grade Wood Work. This course is designed for primary grade teachers, teachers of subnormal children, teachers of art. The course consists of lectures and shop work. The shop work is divided into three parts: flat piece work, assembled and movable parts, and toy furniture. (1 or 2 cr.; no prereq.; MTW IV and 1 hr. ar.; 24Ed.) Mr. Stockwell.
- Ind.14su. Methods in Mechanical Drawing. A very important part of this course is the demonstration work by students. The course consists of conventions, perspective, isometric, orthographic, working drawings, tracing, and blue printing. Blue print reading will also be taken up. (2 cr.; jr., sr.; MTWTh I and 1 hr. ar.; 115Ed.) Mr. Stockwell.

NOTE.—Shop and drawing content courses have been arranged to be given in engineering departments from 8:00 to 4:00 on Mondays and from 8:00 to 1:00 other days of the week. See this bulletin (Mechanical Engineering) for courses in cabinet-making, machine wood work, wood-turning, wood-finishing, pattern-making, machine shop practice, forging, and autogenous welding. See other pages for courses in drawing.

- Ind.15su. Special Shop and Drawing Courses at Dunwoody Institute, chosen under advice and given letter designation (1a, 1b, etc.) at time of enrolment. List of shop, drawing, and related units available. (2-5 cr.; no prereq.; ar.) Mr. Prosser, Mr. Smith.

SECOND TERM

- 11su.¹ Teachers' Course in Primary Grade Wood Work. (For course description, see First Term, Course 11. (1 or 2 cr.; no prereq.; MTW IV and 1 hr. ar.; 24Ed.)

¹ A laboratory fee of \$1.50 is charged for this course.

- 12su.¹ Methods, Elementary Electric Wiring. This course consists of bell-wiring, inside electric wiring, electric appliance repair, electric appliance manufacture and principles. Method of presenting this work to a class is a very important part of the course. (2 cr.; jr., sr.; no prereq.; MTWF II, III; Ed.24.)
- 13su. Organization and Teaching of Manual Training. A study of the history of manual training, aims and values, selection and installation of equipment, supplies, courses of study for grade and high school manual training and methods of presenting manual training to grade and high school pupils. (2 cr.; prereq., 12 or equiv.; MTWTh I; 115Ed.)

NOTE.—Required courses of the four-year curriculum which fall outside the Department of Trade and Industrial Education are announced in this bulletin as offered during the second term.

SPECIAL EDUCATION

LIBRARY TRAINING

- 7su. School Library Organization and Administration. Instruction in making and using simple library records, keeping books in order and repair, with practice in preparing books for the shelves, mending, etc. One hour class work, three hours' practice work. (3 cr.; jr., sr.; MTWThFS I; 117Ed.) Miss Penrose.
- 9su. Book Selection for the High School Library. Aims to give practical acquaintance with a variety of literature for adolescents. Two hours' class work, three hours' practice work in library. (3 cr.; jr., sr.; MTWThFS II; 117Ed.) Miss Penrose.

SPEECH DISORDERS AND BEHAVIOR PROBLEMS OF CHILDREN

This course is designed for teachers, principals, and all those interested in the training of children, as well as those who aim to specialize in the teaching of corrective speech.

- 133su. Disorders of Speech. Discussion of the emotional life of the child and its relation to the development of speech; the nervous disorders of speech with special reference to stuttering, treatment of stuttering, and cognate behavior difficulties. (2½ cr.; MTWThF IV; 113Ed.) Dr. Blanton.
- 141su. Phonetic Disorders of Speech. The discussion of the English sounds and how they are made; discussion of the cause and treatment of lisping and the oral inactivities; discussion of delayed speech and its treatment. (2½ cr.; MTWFS III; 113Ed.) Dr. Blanton, Miss Green.
- 142su.¹ Advanced Course in the Correction of Speech Disorders. A lecture demonstration course in which various types of speech disorders will be presented. The cause and treatment of these cases will be discussed by the instructor and the class. (1½ cr.; prereq., Ed. 133 and 141 or equiv.; MTWThF I; John Marshall High School.)

¹ A laboratory fee of \$1.50 is charged for this course.

- 146su.¹ Speech Clinic—Practice and the Diagnosis of the Various Disorders of Speech. A study of the methods of treatment of speech disorders by means of physical re-education, training in rhythmic co-ordinations, posture work, corrective gymnastics, corrective phonetics, and emotional re-education. (1½ cr.; MTWThF VI-VII; John Marshall High School.) Dr. Blanton, Miss Brownell, Miss Green, Mrs. Whalen.
- 147su.¹ Advanced Speech Clinic. This clinic is for teachers who have had the beginning course in former years. They will have **special work**. (1½ cr.; MTWThF VI-VII; John Marshall High School.) Dr. Blanton, Miss Brownell, Miss Green, Mrs. Whalen.

COURSES OFFERED FOR TEACHERS OF SUBNORMAL CHILDREN

Department of History and Philosophy of Education

3su. Educational Sociology.

Department of Trade and Industrial Education

Ind.10su. Teachers' Course in Elementary Wood Work.

Ind.11su. Teachers' Course in Primary Grade Wood Work.

Department of Theory and Practice of Teaching

17su. Practice Teaching (with subnormal children).

Department of Art Education

36Asu. Cardboard and Paper Construction.

37su. Elementary Basketry.

38su. Allied Crafts.

39su. Advanced Reed Work.

40su. Advanced Weaving.

41su. Elementary Pottery.

Department of Educational Psychology

134su. Mental Tests

143su. Individual Mental Examination.

149su. Psycho-Educational Clinic.

192su. Psychology of Behavior Problems in Children.

¹ A laboratory fee of \$1.50 per credit hour will be charged.

THE SCHOOL OF BUSINESS

GENERAL INFORMATION

ADMISSION TO THE SCHOOL OF BUSINESS

For admission to the School of Business a student must have satisfied the requirements of one of the two-year pre-business courses, either in the College of Science, Literature, and the Arts, the College of Agriculture, Forestry, and Home Economics, or the College of Engineering. However, students entering from other colleges and universities of recognized standing may be admitted if deficient in not more than two of the following: accounting, psychology, statistics, provided (1) that this deficiency is removed during the first year in the School of Business, and (2) that a minimum of 90 credits and 90 honor points is granted by the university examiner for the work done elsewhere.

SPECIAL STUDENTS

A limited number of high school graduates who have reached the age of twenty-four and can furnish evidence to the effect that they have had at least three years of successful business experience in an executive capacity may be admitted as special students. They will be required to maintain a C average and must not elect more than 12 hours of work per quarter. If later they decide to become candidates for a degree they must complete the requirements of the pre-business course.

STUDENTS IN OTHER SCHOOLS OR COLLEGES OF THE UNIVERSITY

Regularly enrolled students in other schools or colleges of the University may be admitted to such courses in the School of Business as are authorized by the faculties of the School of Business and the school or college concerned. Such students are urged to select their business subjects in accordance with a definite plan, and as far as possible to complete a systematic course of business study. *Only those courses in the School of Business are open to students of other schools or colleges of the University which are announced in the bulletin of that school or college.*

DESCRIPTION OF COURSES¹

FIRST TERM

6su. Principles of Economics (elementary course). Principles that underlie the present industrial order with reference to production and consumption. Application of these principles to corporations and trusts, with a brief study of money and banking. (3 cr.; no prereq.; soph, jr., sr.; Sec. 1, MTWThFS II; 209B; Sec. 2, MTWThFS IV; 209B.) Mr. Taylor.

¹ See also courses in Agricultural Economics, page 56.

- 14su. Elements of Statistics. Elementary principles of classification, analysis, and presentation of statistical materials, with primary emphasis on economic data. Lectures, readings, and laboratory work. (5 cr.; prereq., 6, 7; soph., jr., sr.; MTWThFS II; 109B; lab., MTWFS III and 1 hr. ar.; 303B.) Mr. Graves, Mrs. Youngs.
- 25su. Principles of Accounting (First half). Purpose and principles of account classification; capital and revenue; accruals; valuation; depreciation; preparation and interpretation of balance sheets; income accounts, and other statements; introduction of partnership and corporation accounts. A laboratory course with supplementary lectures. (4 cr.; prereq., 6, 7, or concurrently; soph., jr., sr.; MTWThFS IV; lab., Sec. 1, MTW V; Sec. 2, ThFS V; 301B.) Mr. Heilman, Mrs. Youngs.
- 58su. Economics of Insurance. A general course dealing with the principles underlying life, property, and other important forms of insurance. (3 cr.; jr., sr.; prereq., 6, 7; MTWThFS IV; 102B.) Mr. Graves.
- 85su. Principles of Marketing. A general course dealing with the mechanism and operation of markets: classification, organization, market agencies as factors in production. The price-making process; control of supply, assumption of risk, incidence of marketing costs. Wastes of competition. (3 cr.; prereq., 6-7; jr., sr.; MTWFS III and 1 hr. ar.; 202B.) Mr. Vaile.
- 103su. Value and Distribution. An advanced course in economic theory, prices and costs; the value theory. For the Summer Session this course is the equivalent of Course 101. (3 cr.; prereq., 6, 7; jr., sr., grad.; MTWThFS I; 102B.) Mr. Garver, Mr. Waite.
- 130su. Cost Accounting. General survey of principles and methods of cost accounting with some practice in cost routines, applications of cost accounting to problems of management. (3 cr.; prereq., 25, 26; jr., sr., grad.; MTWThFS V; 303B.) Mr. Heilman.
- 143su. The Financial System. Relation to industrial system. Monetary principles with special reference to United States. American banking and bank organization, principles of commercial banking, non-commercial banking, relation of government to banking, comparative study of leading foreign systems. (3 cr.; prereq., 6, 7; jr., sr., grad.; MTWThFS II; 102B.) Mr. Myers.
- 149su. Business Cycles. American business conditions since 1890 with regard to the great cycles of alternate prosperity and depression, and financial panics. Critical examination of all the available business barometers designed to forecast similar conditions. (3 cr.; prereq., 143, 144; jr., sr., grad.; MTWThFS II; 202B.) Mr. Hansen.
- 155su. Corporation Finance. The organizing, financing, and managing of corporations. A study of corporate securities for purposes of promotion and reorganization and of facilities for marketing them. (3 cr.; prereq., 143, 144; jr., sr., grad.; MTWThFS III and 1 hr. ar.; 102B.) Mr. Myers.

- 161su. Labor Problems. A discussion of employment; hours; wages; extent and strongholds of unionism; open and closed shops; collective bargaining; industrial unrest; government regulation of labor disputes. (3 cr.; prereq., 6-7; jr., sr., grad.; MTWThFS I; 202B.) Mr. Hansen.
- 176su. Commercial Policies. Theory of international commerce; free trade, reciprocity, subsidies, preferential treatment, the open door, international finance, commercial treaties, foreign policies, and other governmental and organized efforts to affect trade. American problems emphasized. (3 cr.; prereq., 6, 7; jr., sr., grad.; MTWThFS IV; 202B.) Mr. Vaile.

SECOND TERM

- 7su. Principles of Economics. A continuation of Course 3su. (3 cr.; prereq., 6; soph., jr., sr.; MTWFS III and 1 hr. ar.; 202B.) Mr. Stead.
- 72su. Economics of Transportation. The theory and practice of rate-making. Government regulation, the conflict between state and federal authorities, and suggested improvements in control of transportation agencies. (3 cr.; prereq., 6, 7; jr., sr.; MTWThFS IV; 102B.) Mr. Cummings.
- 104su. Value and Distribution. A continuation of Course 103su. Rent, wages, and profits. For the Summer Session this course is the equivalent of Course 102. (3 cr.; prereq., 103; jr., sr., grad.; MTWThFS I; 202B.) Mr. Garver, Mr. Waite.
- 144su. The Financial System. A continuation of Course 143su. (3 cr.; prereq., 143; jr., sr., grad.; MTWThFS I; 202B.) Mr. Stehman.
- 146su. Investments. Bonds, mortgages, endowments, annuities, stocks, and other forms of property in which funds may be invested or risked, with particular emphasis on the needs of the conservative investor. The criteria of a good investment are carefully considered and tested by applying them to specific issues of governments, corporations, and individuals, including railroad, industrial, timber, and mining securities, and real estate loans. (3 cr.; prereq., 155; jr., sr., grad.; MTWThFS II; 102B.) Mr. Stehman.
- 147su. The Trust Problem. A discussion of the conditions in modern industrial society which have brought about the development of industrial combinations. Motives for combination. Their sources of power and elements of weakness. Social advantages and evils of trusts. Attempts at state and federal regulation. Elements of an intelligent future policy toward industrial combination. (3 cr.; prereq., 91, 155; jr., sr., grad.; MTWFS III and 1 hr. ar.; 102B.) Mr. Stehman, Mr. Cummings.
- 167su. Personnel Administration. Managerial policy for various types of organization, of labor. Special attention to job analysis, employment incentives, and regularization of employment. (3 cr.; prereq., 161; jr., sr., grad.; MTWThFS II; 202B.) Mr. Hansen, Mr. Stead.

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