

course graduates who petition to enter the upper division here are required first to make up all deficiencies in the lower division of the degree course and then complete 90 units of work to satisfy the upper division requirements.

Students who wish to transfer during the first two years to the academic lower division must petition the personnel committee for permission to make the change. Ordinarily, such students are given a trial, or adjustment, program for two or more quarters to establish their ability to carry the academic work.

THE TEACHERS COLLEGE

REQUIREMENTS FOR THE A. B. DEGREE

In all departments of the college, candidates for the Bachelor of Arts degree must complete at least 186 quarter units for graduation. At least 45 units, including 9 units of the last year's work, must be completed in residence. Not more than 75 of the 186 quarter units required for the degree may be taken in any one department.

It should be noted that all degree courses include the following requirements (no part of these requirements can be satisfied by entrance credit earned in high school):

Natural Science* ----- 18 units

Including

Both physical and biological fields.

A year laboratory course.

Hygiene (unless year course is physiology).

English ----- 9 units

Including (except in pre-secondary programs).

Composition, 2 quarters.

Public Speaking or Oral Interpretation.

Physical Education (Activity, 2 years) ----- 3 units

Social Science ----- 18 units

Including

A year course.

U. S. Constitution.

Education----- Not less than 18 units

Majors and minors as explained below.

In addition there are special requirements for each degree course. These requirements may be found in the departmental announcements.

MAJORS AND MINORS

In all cases, the candidate for the A. B. degree must fulfill the requirements for one major (at least 36 quarter units, with at least 18 units in the upper division, i.e., junior and senior courses). The candidate must also complete two minors of at least 18 units each, in addition to any required units in the same field. (An exception to this is made when the candidate is getting the special secondary credential only, in which case a major is required in the special field and at least 22½ units are required in professional courses in education.) In the event that an elementary

*Note exception in Music program.

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104A-B. Field Work. Six units of library practice are required for a library credential. Weekly conference. Prerequisite: Lib. 101A, 102A. Application for assignment must be made during the preceding quarter.

Three units; autumn, winter, spring
BACKUS

105. History of Books and Libraries.
Three units; autumn
BACKUS

106A. Book Selection. Study of book selection aids, publishers, editions, series.
One unit; autumn
SMITH

106B. Book Selection. Study of reading habits of adults; order routine.
One unit; winter
SMITH

106C. Book Selection. For school libraries.
One unit; spring
SMITH

107. Library Organization and Administration. Library law, routine, publicity, reports, planning, etc. Prerequisites: Lib. 101A, 102A.
Three units; spring
BACKUS

109. School Libraries. Organization, routine, activities, etc.
Four units; winter
SMITH

MATHEMATICS

Professor Minssen (head); Associate Professors Heath, Robinson; Assistant Professors Bering, Gratz.

The work required for a major or a minor in this department presupposes at least six semesters of high school mathematics, including trigonometry. Deficiencies in preparation may be made up by proper selection from courses 1, 6, and 7.

Courses Required for a Minor in Mathematics

Mathematics 30, 35, 36—Analytic Geometry and Calculus----- 15 units
Upper division courses in mathematics (selected from courses numbered over 100)----- 9 units

Total ----- 24 units

Courses Required for a Major in Mathematics

The work above required for a minor----- 24 units
Additional upper division courses in mathematics----- 12 units

Total ----- 36 units

Program for Pre-Secondary Major in Mathematics

This degree course is planned for students who are going on to a university to work for the master's degree or the secondary credential.

The universities require the graduate student in mathematics to be able to read German and French. This course provides for one language, assuming that the other has been taken in high school. Otherwise part of the electives listed below should be devoted to the second language. Two years of college German and one year of college French are recommended as a minimum upon which to build a reading ability for mathematical literature.

German (or French) may be made the minor by taking courses 50A, 50B, 50C, nine units; thus freeing the nine units listed to the minor to be used as electives. However, physics is the most desirable minor, and can be readily arranged.

First Year

Freshman Orientation -----	1	Units
Physical Education and Hygiene-----	2	
Mathematics 30, 35, 36—Analytic Geometry and Calculus-----	15	
Mathematics 3—Slide Rule-----	1	
English 1A, 1B, 1C—Composition-----	9	
Social Science -----	9	
Natural Science (Recommended: Physics 10A, 10B, 10C)-----	9	

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MATHEMATICS

Professor Minssen (head); Associate Professor Heath; Assistant Professor Gratz; Instructors, Heaslet, Petersen.

The work required for a major or a minor in this department presupposes at least six semesters of high school mathematics, including trigonometry. Deficiencies in preparation may be made up by proper selection from courses 1, 6 and 7.

Courses Required for a Minor in Mathematics

Math. 30, 35, 36—Analytic Geometry and Calculus-----	15
Upper division courses in mathematics (selected from courses numbered over 100)-----	9
Total -----	24
Courses Required for a Major in Mathematics	
The work above required for a minor-----	24
Additional upper division courses in mathematics-----	12
Total -----	36

Program for the A.B. Degree in Mathematics

This degree course is planned primarily for students who expect to work for the master's degree or the general secondary credential. The universities require the graduate student in mathematics to be able to read German and French. This course provides for one language, assuming that the other has been taken in high school, or it may be made an elective here. Two years of college German and one year of college French, or the equivalent, are recommended as a minimum upon which to build a reading ability for mathematical literature. German, or French, may be made the minor by taking courses 50A, 50B, 50C, nine units; thus freeing nine units listed to the minor to be used as electives. However, physics is the most desirable minor, and can be readily arranged.

<i>First Year</i>		<i>Autumn</i>	<i>Winter</i>	<i>Spring</i>
Freshman Orientation -----		1	1	1
Physical Education -----		1	1	1
H.H. 11—Hygiene -----				1
Math. 30—Analytic Geometry -----	5			
Math. 35—Differential Calculus -----			5	
Math. 36—Integral Calculus -----				5
Eng. 3—Slide Rule -----			1	
Eng. 1A, 1B, 1C—Composition -----		3	3	3
Social Science -----		3	3	3
Natural Science (Recommended: Phys. 10A, 10B, 10C) -----		3	3	3

Second Year

Physical Education -----	1	1	1
Math. 130—Solid Analytic Geometry-----	3		
Math. 135—Advanced Calculus, I -----		3	
Math. 136—Differential Equations -----		5	
German (or French) -----			5
Natural Science (Recommended: Phys. 51A, 51B, 51C) -----	3	3	3
Social Science (Recommended: Pol. Sc. 1A, 1B, 1C) -----	3	3	3
Electives -----	2	2	2

Third Year

Math. 137—Advanced Calculus, II -----	3		
Math. 140—Functions of a Complex Variable-----		3	
Math. 142—Vector Analysis -----		3	3
German (or French) -----			3
Psychology 55—General -----	5		
Psy. 101—Educational Measurements -----		5	
Minor -----	3	3	3
Electives -----	2	2	7

Fourth Year

Senior Orientation -----	1	1	1
Mathematics (upper division courses) -----	3	3	3
Education or Psychology -----	4		
Minor -----	3	3	3
Electives -----	5	6	6

DESCRIPTION OF COURSES

- 1. Trigonometry. Elementary course with applications. Prerequisite: three semesters high school algebra or Math. 6 or Math. 7. MINNSEN, PETERSEN
- 2. Slide Rule. Methods of calculation. PETERSEN
- 3. One unit; winter
- 4. A Survey Course in Mathematics. A descriptive course giving the fundamental notions of elementary college mathematics. MINNSEN
- 5. Intermediate Algebra. An intensive course for students with not more than three semesters of high school algebra. PETERSEN
- 6. Three units; winter
- 7. Surveying. Prerequisites: Math. 1, Linear Drawing and Lettering. Six hours of field and drafting and one hour of lecture per week. PETERSEN
- 8. Three units; autumn, spring
- 9. Surveying. Continuation of 10A. PETERSEN
- 10. Three units; winter, spring

*If part of this language has been taken in high school, count one year in high school equivalent to one quarter in college.

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- 30. Analytic Geometry. Prerequisite: Math. 1.
Five units; autumn, winter, spring
HEATH, MINNSEN
- 35. Differential Calculus. Prerequisite: Math. 30.
Five units; winter, spring
MINNSEN, PETERSEN
- 36. Integral Calculus. Prerequisite: Math. 35.
Five units; autumn, spring
MINNSEN, HEASLET
- 58. College Algebra. Prerequisite: Math. 30.
Five units; autumn
HEASLET
- 60. Mathematics of Investment. Prerequisite: Math. 1.
Five units; spring
HEATH
- 70. Descriptive Geometry. The principles and methods used in determining the space relations of points, lines and planes and their combinations. Prerequisites: Linear Drawing and Lettering. Six hours of drafting and two hours of lecture per week.
Four units; winter
PETERSEN
- 80. Surveying. Continuation of Math. 10. Nine hours per week in the field and drafting room.
Three units; spring
PETERSEN
- 104. History of Mathematics.
Three units; spring
HEASLET
- 110. Topographic and Mine Surveying. Advanced individual problems.
Three units; offered by special arrangement
- 115. Projective Geometry. A course in nonmetrical modern geometry with applications to the conics. Prerequisite: Math. 30.
Five units; winter (Given in alternate years)
HEATH
- 120. Theory of Statistics. Averages, moments, the normal law, two-variable correlation, point binomial, sampling; multiple and partial correlation. Prerequisite: Math. 36.
Five units; winter (Given in alternate years)
HEATH
- 125. Analytic Mechanics. Prerequisite: Math. 36.
Three units; winter
PETERSEN
- 130. Solid Analytic Geometry. Prerequisite: Math. 36.
Three units; autumn
HEASLET
- 135. Advanced Calculus, I. Functions, power series, partial differentiation and multiple integrals with geometric applications. Prerequisite: Math. 36.
Three units; winter
HEASLET

AERONAUTICS

- 136. Differential Equations. Prerequisite: Math. 135.
Three units; spring
HEASLET
- 137. Advanced Calculus, II. Prerequisite: Math. 136.
Three units; autumn (Given in alternate years)
HEASLET
- 140. Functions of a Complex Variable. Prerequisite: Math. 136.
Three units; autumn (Given in alternate years)
HEASLET
- 142. Vector Analysis. Prerequisite: Math. 136.
Three units; spring (Given in alternate years)
- 144. Infinite Series. Prerequisite: Math. 36.
Three units; spring (Given in alternate years)
HEASLET
- 145. Theory of Numbers.
Three units; spring
HEASLET
- 155. The Teaching of Mathematics.
Two or three units; by arrangement
MINNSEN
- 1. Principles of Aeronautics. Essential principles of flight of all types of aircraft; aerodynamics; static stability, controllability, and performance calculations.
Three units; autumn
PETERSEN
- 2. Principles of Aeronautics. Continuation of Aero. 1, but Aero. 1 is not a prerequisite.
Three units; winter
PETERSEN
- 3. Principles of Aeronautics. Continuation of Aero. 2, but Aero. 1 and 2 are not prerequisites.
Three units; spring
PETERSEN
- 30. Aeronautics Laboratory. Maintenance, repair and overhaul of aircraft engines as applying to modern commercial aircraft power plants; and the rigging of airplanes.
Note: The laboratory time in this course may be used as credit toward the aircraft master mechanic's license, U. S. Dept. of Commerce.
Two units; autumn
PETERSEN
- 31. Aeronautics Laboratory. Continuation of Aero. 30, but Aero. 30 is not a prerequisite.
Two units; winter
PETERSEN
- 32. Aeronautics Laboratory. Continuation of Aero. 31, but Aero. 31 is not a prerequisite.
Two units; spring
PETERSEN