Mathematics, BA

Requirements

The Bachelor of Arts with a major in mathematics requires a minimum of 120 s.h., including at least 38–48 s.h. (11–12 courses) of work for the major. Total credit for the major depends on a student's choice of Program A, B, or C. Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences GE CLAS Core.

All students complete the post-calculus mathematics requirement, the upper-level mathematics requirement, and the requirements for Program A, B, or C.

For policies concerning transfer credit, correspondence credit, credit by examination, cumulative grade-point average, general rules relating to regression and duplication, and so forth, see For Undergraduate Students on the College of Liberal Arts and Sciences website.

For information about duplication, regression, and use of the second-grade-only option for mathematics courses, contact the Department of Mathematics or visit the Department of Mathematics website. The website also provides details about schedule planning and career options for mathematics students. For more information on admission, financial support, employment opportunities, the faculty, facilities, and other topics, visit the Department of Mathematics or the University of Iowa website.

The BA with a major in mathematics (Program A, B, or C) requires the following coursework.

Requirements	Hours
Program Requirements (semester hours vary in Program A, B, or C selection)	38-48

Post-Calculus Mathematics Requirement

Students majoring in mathematics must earn at least 15 s.h. in post-calculus mathematics courses (prefix MATH) offered by the Department of Mathematics or cross-referenced with a mathematics course at the University of Iowa; students may not count transfer courses or credit by exam toward this requirement.

Post-calculus courses in the Department of Mathematics are numbered 2000 or above, excluding these:

Course #	Title	Hours
MATH:3700	Introduction to Matrix Theory	3
MATH:3750	Classical Analysis	4
MATH:3995	Topics in Mathematics	3
MATH:3996	Individual Study and Honors in Mathematics	arr.
MATH:3997	Readings in Mathematics	arr.
MATH:4010	Basic Analysis	3
MATH:4020	Basic Abstract Algebra	3

Upper-Level Mathematics Requirement

Majors must take at least one upper-level mathematics course for the BA degree. Upper-level mathematics courses include MATH:3900 Introduction to Mathematics Research and courses numbered 4000 or above, excluding these:

Course #	Title	Hours
MATH:4010	Basic Analysis	3
MATH:4020	Basic Abstract Algebra	3
MATH:4120	History of Mathematics	3

No courses from other departments can be counted as upper-level mathematics courses unless they are cross-referenced with an upper-level mathematics course (prefix MATH).

Program A

Program A is primarily for students who plan to work in business or government or to pursue graduate study in mathematics.

Program A: Core Courses

Students must complete a two-semester sequence of MATH:1850 Calculus I and MATH:1860 Calculus II. Advanced placement credit, CLEP credit, and credit granted through the Mathematics Incentive Program are accepted for all or part of the calculus requirement.

Students complete the following core courses.

Course #	Title	Hours
MATH:1850 & MATH:1860	Calculus I-II	8
MATH:2700	Introduction to Linear Algebra	4
MATH:2850	Calculus III	4
MATH:3600	Introduction to Ordinary Differential Equations	3
MATH:3720	Introduction to Abstract Algebra I	4
MATH:3770	Fundamental Properties of Spaces and Functions I	4

More advanced courses may be substituted for the core courses with Department of Mathematics approval.

Program A: Electives

Students complete four electives (12–16 s.h.), including at least two courses with a MATH prefix. Of these two courses, at least one course must be an upper-level mathematics course.

Mathematics

Students may choose from mathematics courses numbered MATH:2150 Foundations of Geometry, MATH:3800 Introduction to Numerical Methods, or courses above MATH:3800, excluding MATH:4010 Basic Analysis and MATH:4020 Basic Abstract Algebra.

Computer Science

Students may choose computer science courses numbered CS:1210 through CS:4740, excluding CS:3210 Programming Languages and Tools, CS:3910 Informatics Project, CS:3980 Topics in Computer Science I, and CS:3990 Honors in Computer Science or Informatics.

Statistics and Actuarial Science

Students may choose statistics courses numbered STAT:2020 Probability and Statistics for the Engineering and Physical Sciences, STAT:3100 through STAT:4740, STAT:5100 through STAT:5120, excluding STAT:3510 Biostatistics, STAT:4143 Introduction to Statistical Methods, and STAT:4200 Statistical Methods and Computing.

Among the courses listed above, only one of the following three courses can be counted toward the elective requirement: STAT:2020, STAT:3100, or STAT:3120. None of these courses can be counted as credit earned toward graduation if taken after STAT:4100 Mathematical Statistics I owing to regression policies.

Students may choose actuarial science courses numbered ACTS:3080 Mathematics of Finance I and ACTS:4130 through ACTS:4380.

Consult the Department of Mathematics website for a complete list of electives in computer science, and statistics and actuarial science.

Program B

Program B is intended for students seeking secondary school teaching licensure. Students who wish to earn teaching licensure in addition to earning a Bachelor of Arts with a major in mathematics also must complete the Teacher Education Program (TEP); see "Teacher Licensure" below.

Program B: Core Courses

Students must complete a two-semester sequence of MATH:1850 Calculus I and MATH:1860 Calculus II. Advanced placement credit, CLEP credit, and credit earned through the Mathematics Incentive Program are accepted for part or all of the calculus requirement. Students complete the following core courses.

Course #	Title	Hours
MATH:1850 & MATH:1860	Calculus I-II	8
MATH:2150	Foundations of Geometry	3
MATH:2700	Introduction to Linear Algebra	4
MATH:2850	Calculus III	4
MATH:3720	Introduction to Abstract Algebra I	4
MATH:3770	Fundamental Properties of Spaces and Functions I	4
MATH:4050	Introduction to Discrete Mathematics	3
or MATH:4060	Discrete Mathematical Models	
CS:1210	Computer Science I: Fundamentals	4
STAT:3120	Probability and Statistics	4

More advanced courses may be substituted for the core courses with Department of Mathematics approval.

Program B: Electives

Students in Program B must take at least one additional Department of Mathematics post-calculus course (3–4 s.h.). The post-calculus courses must be chosen avoiding duplication and regression with the core mathematics courses, particularly when engineering mathematics courses are considered. With the department's approval, capable students are encouraged to substitute more advanced courses in the same subject area for any of the electives. The Department of Mathematics website offers advice on course selection.

Teacher Licensure

Students interested in teaching in elementary and/or secondary schools should seek admission to the Teacher Education Program (TEP) in the College of Education.

To qualify for licensure in secondary teaching, students in the TEP complete a degree in education as well as a related College of Liberal Arts and Sciences degree. See Apply on the College of Education website for details on requirements and deadlines for applying to the College of Education and about TEP choices of majors leading to licensure.

Students who wish to earn teacher licensure should choose Program B; see "Program B" above.

Program C

The Department of Mathematics encourages students of other majors to take more mathematics courses and attempt a BA or BS secondary major, or a secondary degree if their first major is outside CLAS, in mathematics. Program C offers a curricular path to achieve this goal.

Program C enables students to specialize in a mathematics-related subtrack, such as the mathematics of biochemistry, biomathematics, biostatistics, chemistry, computer science, data science, economics, engineering (all departments), finance, physics, risk management and insurance, and statistics and actuarial science. In consultation with the faculty advisor, students build on the Program C core to prepare a subtrack plan of study tailor-made to their interests and academic or career goals. The proposed plan of study must be approved by the Department of Mathematics.

Students must file their subtrack plan of study before they begin their senior year; they use the Program C Plan of Study form, available at the Department of Mathematics website. The website has templates for choosing electives in several areas; students may use these or propose other plans.

Program C: Core Courses

Students must complete a two-semester sequence of MATH:1850 Calculus I and MATH:1860 Calculus II. Advanced placement credit, CLEP credit, and credit earned through the Mathematics Incentive Program are accepted for part or all of the calculus requirement. Students complete the following core mathematics courses.

Course #	Title	Hours
MATH:1850 & MATH:1860	Calculus I-II	8
MATH:2700	Introduction to Linear Algebra	4
MATH:2850	Calculus III	4
One additional "proofs" course such as MATH:3720 or MATH:3770		4

More advanced courses may be substituted for the core courses with Department of Mathematics approval.

Program C: Electives

Students choose six or seven electives beyond the core math courses, depending on their subtrack. All electives must be offered for 3–4 s.h. of credit. At least three of the electives must be mathematics courses (prefix MATH), including MATH:3600 Introduction to Ordinary

Differential Equations or higher, but excluding MATH:3700 Introduction to Matrix Theory, MATH:3750 Classical Analysis, MATH:3995 through MATH:3997, MATH:4010 Basic Analysis, MATH:4020 Basic Abstract Algebra, and MATH:4120 History of Mathematics. Independent study, reading, topics, seminar, and project courses are not allowed unless approved by the Department of Mathematics in advance. Of these three math courses, at least one course must be an upper-level mathematics course. See "Post-Calculus Mathematics Requirement" and "Upper-Level Mathematics Requirement" above.