

Mathematics

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The mathematics major is designed to prepare students for graduate work in mathematics, for teaching mathematics in secondary school, and for a variety of careers in mathematics-related fields in government, business, or industry.

All students are expected to learn methods and techniques of problem-solving and to develop facility in the mathematical mode of thinking. They are expected to become acquainted with the major areas of current interest in mathematics, with the great achievements of the past, and with the fundamental problems of number, space, and infinity.

The minor in Applied Mathematics is designed for students majoring in any discipline that uses mathematical tools to enhance that field of study, especially physics, economics, biology, chemistry or any social science with a quantitative focus. The minor will introduce students to calculus, linear algebra, differential equations and mathematical modeling.

A student with a major or minor in Mathematics may not also minor in Applied Mathematics.

Learning Outcomes

- Explain core concepts in algebra and analysis
- Analyze the reasoning in mathematical proofs
- Construct clear, coherent, and logical proofs, including proofs by contradiction and mathematical induction
- Solve mathematical problems by identifying and applying the mathematical techniques appropriate to each problem
- Demonstrate clear written articulation and effective oral communication of mathematical ideas
- Implement mathematical skills and techniques in real-world problems outside of mathematics

Degree Requirements for the Major

General College Requirements

General College Requirements (see Curriculum section), including the following requirements to satisfy the major

Required Mathematics Courses

- MATH 151: Calculus I
- MATH 152: Calculus II
- MATH 255: Vector Calculus
- MATH 256: Linear Algebra
- MATH 281: Foundations of Mathematics
- MATH 312: Differential Equations
- MATH 321: Abstract Algebra I
- MATH 351: Analysis I

Elective Mathematics Courses

- Either MATH 422: Abstract Algebra II or MATH 452: Analysis II
- One additional seniorlevel mathematics** course

A student completing a 4-credit experience for their capstone requirement will be required to complete an additional senior-level mathematics* course for a total of two senior-level mathematics* courses beyond the required MATH 422 or MATH 452.

Capstone Experience

All students must select one of the following three options as the capstone experience of their education:

- St. Mary's Project in Mathematics (eight credits)*
- Senior Topisc Seminar in Mathematics: MATH490 (four credits)
- Senior Project in Mathematics: MATH 495 (four credits)

The requirement may also be satisfied by completing a St. Mary's Project in another area. If a student wishes to do a project in another area, the approval of the department must be secured in advance.

* Senior-level mathematics courses carry the designation "MATH 4xx". ". COSC 440 (Theory of Computation) or COSC 455 (Graph Theory) can be taken in place of a senior-level mathematics course.

Minimum Grade and GPA Requirements

Students must earn a grade of C- or better in all courses required for the major and maintain an overall GPA of 2.0 or better in these required courses.

Recommendations

Students who are interested in graduate studies in theoretical mathematics should add at least two senior-level courses in theoretical mathematics to their schedules and should take both Abstract Algebra II and Analysis II. It is also recommended that all students majoring in mathematics develop a proficiency in programming during their studies. This may be obtained by taking the course COSC 120. Acquiring skills with a mathematics software package such as Maple or Mathematica is desirable.

Degree Requirements for the Minor

Required Courses

- MATH 151: Calculus I
- MATH 152: Calculus II
- MATH 255: Vector Calculus
- MATH 256: Linear Algebra
- MATH 281: Foundations of Mathematics

Minimum Grade and GPA Requirements

Students must complete the required five courses, earn a grade of C- or better in each course taken to fulfill the minor, and the cumulative grade-point average of courses used to satisfy the minor must be at least 2.0.

Degree Requirements for the Applied Mathematics Minor

Required Courses

- MATH 151: Calculus I
- MATH 152: Calculus II
- MATH 255: Vector Calculus
- MATH 256: Linear Algebra
- MATH 312: Differential Equations

- MATH 444: Mathematical Modeling

Minimum Grade and GPA Requirements

Students must complete the required six courses, earn a grade of C- or better in each course taken to fulfill the minor, and the cumulative grade-point average of courses used to satisfy the minor must be at least 2.0.

Requirements for Teacher Certification

A Master of Arts in Teaching Program is available at St. Mary's College of Maryland after completion of the baccalaureate degree. Students who are interested in becoming teachers should contact the chair of the Department of Educational Studies or an education adviser in their major field of study for suggested coursework in educational studies, and their specific major. These consultations should take place during the first semester of the sophomore year. It is recommended that such students take statistics (MATH 221).

Faculty

Seth Cowell, Sandy Ganzell, Susan Goldstine, Alan Jamieson (Department Chair), Lindsay H. Jamieson, Robert Kelley, Emek Köse, David Kung, Alex Meadows, Simon Read, Ivan Sterling, Ariel Webster