MATHEMATICS
UNDERGRADUATE MAJOR
(BS, HBS)

This major offers the following option(s):

- Mathematical Biology (http://catalog.oregonstate.edu/college-departments/science/mathematics/mathematics-bs-hbs/mathematical-biology-option/)
- Statistics (http://catalog.oregonstate.edu/college-departments/science/mathematics/mathematics-bs-hbs/statistics-option/)

The BS degree in Mathematics requires a common core of courses at the lower-division level and junior-level followed by senior-level depth and breadth requirements. The upper-division requirements in the major total 45–50 credits. Thus, a mathematics major has ample opportunity to take further mathematics courses focused toward specific interests and career goals. Programs supporting interdisciplinary interests are strongly encouraged.

Major Code: 560

- Demonstrate mathematical reasoning skills by reading, writing, and explaining formal definitions, theorems, and proofs.
- Analyze mathematical problems by applying the theory and techniques from a variety of mathematical perspectives.
- Use computational technology to support problem solving and mathematical understanding.
- Use mathematical concepts and techniques to recognize, formulate and analyze questions from another discipline.
- Communicate mathematics effectively.

The following requirements are specific to the BS degree in Mathematics. Students must also satisfy OSU degree and baccalaureate core requirements.

A grade of at least C– and a GPA of 2.25 are required in all mathematics courses used to fulfill degree requirements. No course used to fulfill requirements for the mathematics major or any of its options may be taken S/U.

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<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS</td>
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<td>MTH 252</td>
<td>INTEGRAL CALCULUS</td>
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<td>MTH 256</td>
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<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS</td>
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<td>Upper-Division Requirements:</td>
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Part A: Required Mathematics Core Classes

Part B: Computational Requirement

Select one of the following writing intensive courses (WIC): 3

- MTH 323  *MATHEMATICAL MODELING
- MTH 333  *FUNDAMENTAL CONCEPTS OF TOPOLOGY
- MTH 338  *NON-EUCLIDEAN GEOMETRY

Part C: Area Course Work

Select 15 credits from the following six areas: 1

Algebra and Number Theory

- MTH 440  COMPUTATIONAL NUMBER THEORY
- MTH 441  APPLIED AND COMPUTATIONAL ALGEBRA
- MTH 442  APPLIED AND COMPUTATIONAL ALGEBRA
- MTH 443  ABSTRACT LINEAR ALGEBRA (cannot be used in a pair to satisfy (a))

Analysis

- MTH 411  REAL ANALYSIS
- MTH 419  MULTIVARIABLE ADVANCED CALCULUS
- MTH 483  COMPLEX VARIABLES (cannot be used in a pair to satisfy (a))

Applied Mathematics

- MTH 420  MODELS AND METHODS OF APPLIED MATHEMATICS
- MTH 427  INTRODUCTION TO MATHEMATICAL BIOLOGY
- MTH 428  STOCHASTIC ELEMENTS IN MATHEMATICAL BIOLOGY
- MTH 480  SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS
- MTH 481  APPLIED ORDINARY DIFFERENTIAL EQUATIONS
- MTH 482  APPLIED PARTIAL DIFFERENTIAL EQUATIONS

Geometry and Topology

- MTH 430  METRIC SPACES AND TOPOLOGY
- MTH 434  INTRODUCTION TO DIFFERENTIAL GEOMETRY
- MTH 435  DIFFERENTIAL GEOMETRY
- MTH 437  GENERAL RELATIVITY

Numerical Analysis

- MTH 451  NUMERICAL LINEAR ALGEBRA
- MTH 452  NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS
- MTH 453  NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS

Probability

- MTH 463  PROBABILITY I
- MTH 464  PROBABILITY II
- MTH 465  PROBABILITY III
- MTH 467  ACTUARIAL MATHEMATICS

Part D: Election

Select two additional upper division electives of a mathematical nature 2

Total credits required for graduation 180
Mathematics courses at the 400 level are offered in the 6 areas listed. Five 400-level classes satisfying (a) and (b) are required.  
(a) **Depth requirement**: A pair of classes from one of the 6 areas is required. Some exceptions are noted.  
(b) **Breadth requirement**: One course each from 3 of the 5 remaining areas.  
This includes non-blanket numbered (not X99- or X0X-numbered) upper-division MTH courses, upper-division ST courses, or other courses of a mathematical nature approved by the departmental head advisor. MTH 390 is not allowed.  
MTH 480 and MTH 481 cannot both be used to satisfy program requirements.

* Baccalaureate Core Course (BCC)  
^ Writing Intensive Course (WIC)  

**Major Code**: 560