

MATHEMATICS UNDERGRADUATE MAJOR (BS, HBS)

This major offers the following option(s):

- Applied and Computational Mathematics (<http://catalog.oregonstate.edu/college-departments/science/mathematics/mathematics-bs-hbs/applied-computational-mathematics-option/>)
- Mathematical Biology (<http://catalog.oregonstate.edu/college-departments/science/mathematics/mathematics-bs-hbs/mathematical-biology-option/>)
- Secondary Teaching Emphasis (<http://catalog.oregonstate.edu/college-departments/science/mathematics/mathematics-bs-hbs/secondary-teaching-emphasis-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.

Code	Title	Credits
Lower-Division Requirements		
MTH 251	*DIFFERENTIAL CALCULUS	4
MTH 252	INTEGRAL CALCULUS	4
MTH 253	INFINITE SERIES AND SEQUENCES	4
MTH 254	VECTOR CALCULUS I	4
MTH 255	VECTOR CALCULUS II	4
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
PH 211	*GENERAL PHYSICS WITH CALCULUS	4

Upper-Division Requirements:

Part A. Required Mathematics Core Classes

MTH 311 & MTH 312	ADVANCED CALCULUS I and ADVANCED CALCULUS II	8
MTH 341	LINEAR ALGEBRA I	3
MTH 342	LINEAR ALGEBRA II	4
MTH 343	INTRODUCTION TO MODERN ALGEBRA	4
MTH 355	DISCRETE MATHEMATICS	3
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	
<i>Part B: Computational Requirement</i>		
Select one of the following (can be used to satisfy one requirement in either Part C or Part D):		3
MTH 321	INTRODUCTORY APPLICATIONS OF MATHEMATICAL SOFTWARE	
MTH 351	INTRODUCTION TO NUMERICAL ANALYSIS	
MTH 440	COMPUTATIONAL NUMBER THEORY	
MTH 441	APPLIED AND COMPUTATIONAL ALGEBRA	
MTH 451	NUMERICAL LINEAR ALGEBRA	
MTH 452	NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS	
<i>Part C: Area Course Work</i>		
Select 15 credits from the following six areas: ¹		15
<i>Algebra and Number Theory</i>		
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))	
<i>Analysis</i>		
MTH 411	REAL ANALYSIS	
MTH 419	MULTIVARIABLE ADVANCED CALCULUS	
MTH 483	COMPLEX VARIABLES (cannot be used in a pair to satisfy (a))	
<i>Applied Mathematics</i>		
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 ³	
MTH 481	APPLIED ORDINARY DIFFERENTIAL EQUATIONS ³	
MTH 482	APPLIED PARTIAL DIFFERENTIAL EQUATIONS	
<i>Geometry and Topology</i>		
MTH 430	METRIC SPACES AND TOPOLOGY	
MTH 434	INTRODUCTION TO DIFFERENTIAL GEOMETRY	
MTH 435	DIFFERENTIAL GEOMETRY	
MTH 437	GENERAL RELATIVITY	
<i>Numerical Analysis</i>		
MTH 451	NUMERICAL LINEAR ALGEBRA	
MTH 452	NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS	
MTH 453	NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS	
<i>Probability</i>		
MTH 463	PROBABILITY I	
MTH 464	PROBABILITY II	
MTH 465	PROBABILITY III	
MTH 467	ACTUARIAL MATHEMATICS	
Part D: Electives		
Select two additional upper division electives of a mathematical nature ²		6
Total credits required for graduation		180

2 Mathematics Undergraduate Major (BS, HBS)

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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.

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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.

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MTH 480 and MTH 481 cannot both be used to satisfy program requirements

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Baccalaureate Core Course (BCC)

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Writing Intensive Course (WIC)

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