

























# APPLIED MATHEMATICS, B.S.


 - General Education Course

 - Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.


## Major


The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at <https://www.marshall.edu/gened/>.

Code	Title	Credit Hours
<b>Core Curriculum</b>		
<i>Core 1: Critical Thinking</i>		
FYS 100 	First Yr Sem Critical Thinking	3
MTH 229  	Calculus/Analytic Geom I (CT)	5
	Critical Thinking Course	3
<i>Core 2</i>		
ENG 101 	Beginning Composition	3
ENG 201  	Advanced Composition	3
CMM 103  	Fund Speech-Communication	3
MTH 229  	Calculus/Analytic Geom I (CT)	5
	Core II Natural/Physical Science	4
	Core II Humanities	3
	Core II Social Science	3
	Core II Fine Arts	3
<i>Additional University Requirements</i>		
	Writing Intensive	3
	Writing Intensive	3
	Multicultural or International	3
MTH 490 	Internship in Mathematics (Capstone)	2
	or MTH 491  Senior Seminar	
<b>College-Specific</b>		
	COS Physical/Natural Science	4
	COS Physical/Natural Science	3
<b>Major-Specific</b>		
MTH 229  	Calculus/Analytic Geom I (CT)	5
MTH 230  	Calculus/Analytic Geom II	4
CS 110	Computer Science I	3
MTH 231  	Calculus/Analytic Geom III	4
MTH 300  	Intro to Higher Math	4
MTH 331 	Linear Algebra	4
MTH 490 	Internship in Mathematics (C)	2
	or MTH 491  Senior Seminar	
<i>MTH Sequence I &amp; II</i>		
	Select two of the following elective sequences:	12
	Differential Equations:	
	MTH 335	

MTH 415  Partial Differential Equations  
or MTH 416 Advanced Differential Equation

Numerical Methods:

MTH 443  Numerical Analysis


MTH 411  Mathematical Modeling  
or MTH 442 Numerical Linear Algebra


Probability and Statistics:

STA 445 Probability & Statistics I

STA 446 Probability & Statistics II

Mathematics Education Majors may count the following as a sequence toward the Applied Mathematics Major:

MTH 450  Modern Algebra I

MTH 335  Ordinary Diff Equations  
or MTH 427 Advanced Calculus I


Math Elective or Minor or 2nd Major 3


Math Elective or Minor or 2nd Major 3

Math Elective or 2nd Major 3

Math Elective or 2nd Major 3

*Math Electives*


MTH 335  Ordinary Diff Equations

MTH 360  Intro to Complex Variables

MTH 361  Vector Calculus


MTH 405  History of Mathematics

MTH 411  Mathematical Modeling

MTH 415  Partial Differential Equations


MTH 416 Advanced Differential Equation


MTH 427  Advanced Calculus I


MTH 428  Advanced Calculus II


MTH 430  Topology I

MTH 431  Topology II


MTH 440  Graph Th and Combinatorics


MTH 442  Numerical Linear Algebra

MTH 443  Numerical Analysis

MTH 448  Modern Geometries

MTH 449  Projective Geometry

MTH 450  Modern Algebra I

MTH 452  Modern Algebra II

MTH 455 Number Theory

STA 412 Regression Analysis

STA 413 Experimental Designs

STA 420 Nonparametric Statistics

STA 422 Time Series Forecasting

STA 425 Sampling Designs & Estimation

STA 445 Probability & Statistics I

STA 446 Probability & Statistics II

STA 464 Statistical Computing

STA 466 Stochastic Processes

STA 470 Applied Survival Analysis

300/400 Elective 3

300/400 Elective 3

Free Elective 3

Free Elective	3
Free Elective	3
Free Elective	3
Free Elective	3
Free Elective	3
Free Elective	1


## Major Information

- Applied Mathematics majors are not required to satisfy the College of Science requirement of a minor in another discipline. However, Applied Mathematics majors often elect to complete a second (or more) major(s) and/or one (or more) minor(s).
- Math electives may not duplicate those used for the sequence requirements. The number of elective courses required depends on whether a student is pursuing an outside minor or a 2nd major. The following are the three options:
  - No Outside Major or Minor: A student may graduate with a major in Applied Mathematics, without a second major or a minor, by completing an additional 4 elective mathematics courses from the list of electives. The major requires 50 credit hours.
  - Outside Minors: A student graduating with a single major in Applied Mathematics, and at least one minor outside the department, must complete at least 2 additional elective mathematics courses. Effectively, the major requires 44 credit hours.
  - Outside Double Majors: A student graduating with multiple majors, including Applied Mathematics, need not take any additional elective math courses. Effectively, the major requires 38 credit hours. A student pursuing multiple majors, including at least two of the majors in the department, should consult with the undergraduate coordinator or chair of the department for details.
- Since the major is quite flexible, students are expected to consult with the undergraduate coordinator in the department. Before graduation, the undergraduate coordinator must approve the selection of sequences and electives.
- Please check with advisor about course offerings. Not all classes will be offered every semester.
- Forty (40) hours must be earned in courses numbered 300-499.

## Areas of Emphasis

- Mathematical Statistics, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/science/mathematics/mathematics-bs/mathematical-statistics-emphasis/>)










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## Four Year Plan

The Marshall University Department of Mathematics prepare students for careers in the mathematical sciences and related disciplines. Graduates of our mathematics programs have had successful careers in government and industry. Our graduates have also earned advanced degrees in mathematics, statistics, engineering, and economics. Our degree programs may also be used to prepare for secondary mathematics certification and for professions such as law



or medicine. The department has a dynamic and engaged faculty who focus both on excellent teaching and on many areas of mathematical research.

Course	Title	Credit Hours
<b>First Year</b>		
<b>First Semester</b>		
FYS 100 	First Yr Sem Critical Thinking	3
ENG 101 	Beginning Composition	3
MTH 229 	Calculus/Analytic Geom I (CT)	5
Core II Fine Arts		3
UNI 100	Freshman First Class	1
Credit Hours		15
<b>Second Semester</b>		
MTH 230 	Calculus/Analytic Geom II	4
Core I Critical Thinking		3
CMM 103 	Fund Speech-Communication	3
Multicultural or International		3
Core II Social Science		3
Credit Hours		16
<b>Second Year</b>		
<b>First Semester</b>		
CS 110	Computer Science I	3
MTH 231 	Calculus/Analytic Geom III	4
ENG 201 	Advanced Composition	3
Core II Physical/Natural Science		4
Credit Hours		14
<b>Second Semester</b>		
MTH 300 	Intro to Higher Math	4
Core II Humanities		3
Math Elective or Minor or 2nd Major		3
COS Physical/Natural Science		3
300/400 Elective		3
Credit Hours		16
<b>Third Year</b>		
<b>First Semester</b>		
MTH 331 	Linear Algebra	4
MTH Sequence I		3
Math Elective or Minor or 2nd Major		3
Free Elective		3
Free Elective		1
Credit Hours		14
<b>Second Semester</b>		
MTH Sequence I		3
Writing Intensive		3
Math Elective or 2nd Major		3
Free Elective		3
COS Physical/Natural Science		4
Credit Hours		16

**Fourth Year****First Semester**

MTH Sequence II	3
Writing Intensive	3
Math Elective or 2nd Major	3
300/400 Elective	3
Free Elective	3
Credit Hours	15

**Second Semester**

MTH 490  Internship in Mathematics (C) or MTH 491  or Senior Seminar	2
MTH Sequence II	3
Free Elective	3
Free Elective	3
Free Elective	3
Credit Hours	14
Total Credit Hours	120