

# B.A. IN MATHEMATICS

*College of the Sciences and Mathematics*

## Curriculum

Code	Title	Credits
<b>GENERAL EDUCATION REQUIREMENTS</b> ( <a href="http://catalog.wcupa.edu/undergraduate/general-education-requirements/">http://catalog.wcupa.edu/undergraduate/general-education-requirements/</a> )		
<b>Academic Foundations</b>		
First Year Experience requirement		4
English Composition requirement		6-7
Mathematics requirement		3-4
Interdisciplinary requirement		3
Diverse Communities requirement		3
Ethics requirement		3
<b>Distributed Disciplinary Foundations</b>		
Science requirement		6-8
Behavioral & Social Science requirement		6
Humanities requirement		6
Arts requirement		3
<b>ADDITIONAL BACCALAUREATE REQUIREMENTS</b> ( <a href="http://catalog.wcupa.edu/undergraduate/general-education-requirements/">http://catalog.wcupa.edu/undergraduate/general-education-requirements/</a> )		
<b>University Requirements</b>		
Writing Emphasis requirement		9
Speaking Emphasis requirement		9
<b>Degree Requirements</b>		
Language/Culture requirement		0-15
Demonstrating language proficiency through the intermediate level (202).		
Capstone requirement		1-15
<b>MAJOR REQUIREMENTS</b>		
<b>Required Courses</b>		
MAT 161	Calculus I <sup>1</sup>	4
MAT 162	Calculus II	4
MAT 200	The Nature of Mathematics	3
MAT 261	Calculus III	4
MAT 311	Linear Algebra	3
MAT 411	Algebra I	3
MAT 421	Mathematical Statistics I	3
MAT 441	Real Analysis I	3
<b>Mathematics Electives</b>		
Five (5) upper-division (300 level or higher) mathematics courses, at least one in each of the three areas below.		15
<b>Algebra Elective</b>		
MAT 321	Combinatorics and Graph Theory	
MAT 412	Algebra II	
MAT 414	Theory of Numbers	
MAT 415	Introduction to Cryptography	
<b>Analysis Elective</b>		
MAT 343	Differential Equations	
MAT 432	Topology	
MAT 442	Real Analysis II	
MAT 443	Applied Analysis I	
MAT 444	Applied Analysis II	
MAT 445	Complex Variables	
<b>Applied Mathematics Elective</b>		

MAT 325	Numerical Analysis I	
MAT 343	Differential Equations	
MAT 371	Mathematics of Finance	
MAT 413	Computer Algebra	
MAT 415	Introduction to Cryptography	
MAT 422	Mathematical Statistics II	
MAT 423	Applied Probability	
MAT 425	Numerical Analysis II	
MAT 427	Introduction to Optimization Techniques	
MAT 433	Mathematical Modeling	
MAT 478	Fundamentals of Actuarial Science	
MAT 479	Financial Calculus	
STA 319	Applied Statistics	
In lieu of a minor, students may select 3 additional upper-division mathematics courses with approval of the advisor and department chair.		
<b>Related/Cognate Requirements</b>		
CSC 141	Computer Science I <sup>1</sup>	3
PHY 170	Physics I <sup>1</sup>	4
<b>Capstone Requirement</b>		
MAT 480	Capstone in Mathematics <sup>2</sup>	3
<b>Total Minimum Credits Required</b>		<b>120</b>

<sup>1</sup> Satisfies general education requirement.

<sup>2</sup> This course fulfills the Capstone requirement and is also a Writing Emphasis and Speaking Emphasis course.

## Accelerated B.A. in Mathematics to M.A. in Mathematics Program

Students may substitute up to 5 graduate courses for B.A. course requirements, subject to the following guidelines:

Code	Title	Credits
<b>Algebra Elective</b>		
May be replaced by one of the following:		
MAT 513	Linear Algebra	
MAT 514	Theory of Numbers	
MAT 515	Algebra I	
MAT 516	Algebra II	
<b>Analysis Elective</b>		
May be replaced by one of the following:		
MAT 535	Topology	
MAT 543	Topics in Differential Equations	
MAT 545	Real Analysis I	
MAT 546	Real Analysis II	
<b>Applied Mathematics Elective</b>		
May be replaced by one of the following:		
STA 505	Mathematical Statistics I <sup>1</sup>	
MAT 548	Industrial Mathematics - Continuous Models	
MAT 549	Industrial Mathematics - Discrete Models	
MAT 552	Operations Research	
MAT 553	Stochastic Modeling	
MAT 554	Scientific Computing	
MAT 555	Industrial Practicum - Continuous Models	
<b>Mathematics Electives</b>		



May be replaced by any course from the three areas above or any of the following:

MAT 521	Discrete Mathematics & Graph Theory
MAT 532	Geometry I
MAT 533	Geometry II
MAT 595	Topics in Mathematics

#### Student Electives

May be replaced by any course from the four areas above or any other 500-level MAT, MTE, STA, or CSC course.

<sup>1</sup> Or higher level STA course

## Requirement of a Minor

Students in the B.A. degree program are required to complete either a minor or, with the approval of the student's advisor and the Department of Mathematics chairperson, an additional nine credit hours of upper-division mathematics. The discipline chosen for the minor will reflect a student's post-baccalaureate goals. The department recommends completing a minor in the natural sciences (astronomy (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/earth-space-sciences/astronomy-minor/>), biology (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/biology/biology-minor/>), chemistry (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/chemistry/chemistry-minor/>), earth science (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/earth-space-sciences/earth-science-minor/>), geology (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/earth-space-sciences/geology-minor/>), and physics (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/physics-engineering/physics-minor/>)), computer science (<http://catalog.wcupa.edu/undergraduate/sciences-mathematics/computer-science/computer-science-minor/>), economics (<http://catalog.wcupa.edu/undergraduate/business-public-management/economics-finance/economics-minor/>), or finance (<http://catalog.wcupa.edu/undergraduate/business-public-management/economics-finance/finance-minor/>), but other minors may be selected with the approval of the student's advisor and the mathematics chairperson.

All mathematics major courses must be passed with a C- or better.

## Sample Course Plan

To track their individual degree progress, students are advised to access their Degree Progress Report (DPR) via myWCU regularly. For more information, visit [wcupa.edu/DegreeProgressReport](http://wcupa.edu/DegreeProgressReport) (<http://wcupa.edu/degreeprogressreport/>).

The following is a sample suggested course sequence for this program; course offerings and availability are not guaranteed. Students should consult their academic advisor with any questions.

Course	Title	Credits
<b>Year One</b>		
<b>Fall</b>		
MAT 161	Calculus I	4
CSC 141	Computer Science I	3
WRT 120	Effective Writing I	3
or	or Effective Writing with Supplemental	
WRT 123	Writing Workshop	
FYE 100X	First Year Experience	4
Language 101		3
<b>Credits</b>		<b>17</b>
<b>Spring</b>		
MAT 162	Calculus II	4
MAT 200	The Nature of Mathematics	3

PHY 170	Physics I	4
Language 102		3
Behavioral/Social Science Gen Ed		3
<b>Credits</b>		<b>17</b>

#### Year Two

##### Fall

MAT 261	Calculus III	4
MAT 311	Linear Algebra	3
WRT 2XX	200-Level WRT Course	3
Language 201		3
JW Course		3

##### Credits

**16**

##### Spring

Applied Mathematics Elective	3
Minor Elective	3
Arts Gen Ed	3
Language 202	3
Free Elective	3

##### Credits

**15**

#### Year Three

##### Fall

MAT 411	Algebra I	3
MAT 421	Mathematical Statistics I	3
Minor Elective		3
Humanities Gen Ed		3
IS Course		3

##### Credits

**15**

##### Spring

MAT 441	Real Analysis I	3
MAT 480	Capstone in Mathematics	3
Algebra Elective		3
Minor Elective		3
Humanities Gen Ed		3

##### Credits

**15**

#### Year Four

##### Fall

Analysis Elective	3
Mathematics Elective <sup>1</sup>	3
Minor Elective	3
Ethics Gen Ed	3
Free Elective	1

##### Credits

**13**

##### Spring

Mathematics Elective <sup>1</sup>	3
Minor Elective	3
Minor Elective	3
Behavioral/Social Science Gen Ed	3

##### Credits

**12**

##### Total Credits

**120**

<sup>1</sup> Any courses in mathematics with course numbers above 311, with the exception of those courses with a primary focus on teacher education or those courses restricted to students majoring in elementary education.