

B.S. IN MATHEMATICS - APPLIED AND COMPUTATIONAL MATHEMATICS CONCENTRATION

Curriculum

Code	Title	Credits
GENERAL EDUCATION REQUIREMENTS (https://catalog.wcupa.edu/undergraduate/general-education-requirements/)		
Academic Foundations		
	First Year Experience requirement	4
	English Composition requirement	6-7
	Mathematics requirement	3-4
	Interdisciplinary requirement	3
	Diverse Communities requirement	3
	Ethics requirement	3
Distributed Disciplinary Foundations		
	Science requirement	6-8
CSC 141	Computer Science I	
BIO 110	General Biology I	
or CHE 103	General Chemistry I	
or ESS 101	Introduction to Geology	
or PHY 170	Physics I	
	Behavioral & Social Science requirement	6
	Humanities requirement	6
	Arts requirement	3
ADDITIONAL BACCALAUREATE REQUIREMENTS (https://catalog.wcupa.edu/undergraduate/general-education-requirements/)		
University Requirements		
	Writing Emphasis requirement	9
ENG 368	Business and Organizational Writing	
or ENG 371	Technical Writing	
or ENG 375	Client-Based Writing	
MAT 455	Industrial Mathematics Practicum	
	Speaking Emphasis requirement	9
MAT 455	Industrial Mathematics Practicum	
Degree Requirements		
	Capstone requirement	1-15
MAJOR REQUIREMENTS		
Major Courses		
MAT 125	Introduction to Statistics and Probability	
MAT 161	Calculus I	4
MAT 162	Calculus II	4
MAT 200	The Nature of Mathematics	3
MAT 261	Calculus III	4
MAT 311	Linear Algebra ¹	3
STA 200	Introduction to Statistics II	3
STA 319	Applied Statistics	3
MAT 325	Numerical Analysis I	3
MAT 343	Differential Equations	3
MAT 413	Computer Algebra	3
MAT 425	Numerical Analysis II	3
MAT 433	Mathematical Modeling	3

or MAT 427	Introduction to Optimization Techniques	
MAT 443	Applied Analysis I	3
MAT 445	Complex Variables	3
or MAT 441	Real Analysis I	
Related/Cognate Requirements		
Select one of the following:		3
ENG 368	Business and Organizational Writing	
ENG 371	Technical Writing	
ENG 375	Client-Based Writing	
CSC 141	Computer Science I ¹	3
PHY 170	Physics I ¹	3-4
or BIO 110	General Biology I	
or CHE 103	General Chemistry I	
or ESS 101	Introduction to Geology	
Select 12-13 credits of science cognates (PHY, BIO, CHE, CSC, or ESS) under the guidance of an advisor. At least two cognates must be at the 200-level or above.		12-13
Free Electives or Internship		
Select elective credits or internship credits to reach 120 total credits for the degree.		
MAT 491	Internship in Applied Mathematics ²	2-4
Capstone Requirement		
MAT 455	Industrial Mathematics Practicum ³	3
Total Minimum Credits Required		120

¹ Indicates course satisfies a general education requirement.

² MAT 491 is an elective and not a requirement. It may be taken for variable credit and repeated for credit.

³ This course fulfills the Capstone requirement.

Accelerated B.S. Mathematics - Applied and Computational Mathematics to M.S. in Applied and Computational Mathematics Program

To be considered for the accelerated program, students must have attained (completed) 75 credits with a minimum of 24 mathematics credits. Students must have a minimum cumulative GPA of 3.00 including a minimum GPA of 3.00 for mathematics courses. Once admitted to the graduate program, graduate policies apply, including minimum GPA (3.00). See the Graduate Catalog for further details.

Students in the accelerated program can take up to 15 credits of graduate coursework to satisfy the B.S. program requirements. The course list below provides the approved graduate substitutions for undergraduate courses. The remaining graduate courses can be taken in place of free electives in the B.S. program.

Code	Title	Credits
Major Requirements ¹		
MAT 545	Real Analysis I ²	3
or MAT 575	Complex Analysis I	
MAT 548	Industrial Mathematics - Continuous Models ³	3
Free Electives or Internship		
The remaining 9 credits of graduate courses may be taken in place of Free Electives.		9

¹ MAT 500 and one of the Industrial Mathematics Practicum courses (MAT 555 or MAT 556) are waived for students in the accelerated program.

² Choose one (but not both) of these substitutions since the B.S. program requires only one analysis class (real or complex). These courses are substitutions for MAT 441 and MAT 445.

³ MAT 548 is a graduate substitution for MAT 433.

All math 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 Audit via RamPortal regularly. For more information, visit the Degree Audit FAQ webpage (<https://www.wcupa.edu/academicEnterpriseSystems/student-system-modernization/degree-audit-faqs.aspx>).

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.

B.S. in Mathematics - Applied and Computational Mathematics Concentration

Course	Title	Credits
Year One		
Fall		
MAT 125	Introduction to Statistics and Probability	3
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
Credits		17
Spring		
MAT 162	Calculus II	4
MAT 200	The Nature of Mathematics	3
PHY 170	Physics I	4
or	or General Biology I	
BIO 110	or General Chemistry I	
or	or Introduction to Geology	
CHE 103		
or		
ESS 101		
Behavioral/Social Science Gen Ed		3
Humanities Gen Ed		3
Credits		17
Year Two		
Fall		
MAT 261	Calculus III	4
MAT 311	Linear Algebra	3
WRT 2XX	200-Level WRT Course	3
Cognate 1 ¹		3
Humanities Gen Ed		3
Credits		16
Spring		
MAT 343	Differential Equations	3
MAT 325	Numerical Analysis I	3
STA 200	Introduction to Statistics II	3
Cognate 2 ¹		3
Behavioral/Social Science Gen Ed		3
Credits		15
Year Three		
Fall		
MAT 413	Computer Algebra	3
MAT 425	Numerical Analysis II	3

MAT 433	Mathematical Modeling	3
Cognate 3 ¹		3
Arts Gen Ed		3
Credits		15
Spring		
MAT 443	Applied Analysis I	3
STA 319	Applied Statistics	3
ENG 368	Business and Organizational Writing (W)	3
or	or Technical Writing	
ENG 371	or Strategies for Writing in the	
or	Workplace	
ENG 375		
JW Course		3
Free Elective ³		3
Credits		15
Year Four		
Fall		
MAT 441	Real Analysis I	3
or	or Complex Variables	
MAT 445		
Cognate 4 ¹		3
IW Course		3
Free Elective ³		3
Credits		12
Spring		
MAT 455	Industrial Mathematics Practicum	3
MAT 491	Internship in Applied Mathematics ²	4
Free Elective ³		3
Free Elective ³		3
Credits		13
Total Credits		120

¹ Select four Science Cognates (PHY, BIO, CHE, CSC, ESS) under guidance of advisor. At least two cognates must be at the 200-level or above. Discuss with your advisor any prerequisites, for example, CSC 220 requires MAT 151.

² May be taken for variable credit and repeated for credit.

³ Must be approved by advisor. A minor may be obtained by electing appropriate additional classes in a single scientific discipline. Discuss this option with your advisor.

Accelerated B.S. in Mathematics - Applied and Computational Mathematics to M.S. in Applied and Computational Mathematics

Course	Title	Credits
Year One		
Fall		
MAT 161	Calculus I	4
MAT 125	Introduction to Statistics and Probability	3
CSC 141	Computer Science I	3
Humanities Gen Ed		3
Behavioral/Social Science Gen Ed		3
Credits		16
Spring		
MAT 162	Calculus II	4
MAT 200	The Nature of Mathematics	3
WRT 120	Effective Writing I	3

SPK 230	Business and Professional Speech Communication	3
Science Gen Ed		3
Credits		16
Year Two		
Fall		
MAT 261	Calculus III	4
MAT 311	Linear Algebra	3
WRT 200	Critical Writing and Research	3
Cognate 1		3
JW Course		3
Credits		16
Spring		
MAT 343	Differential Equations	3
MAT 325	Numerical Analysis I	3
Cognate 2		3
Behavioral/Social Science Gen Ed		3
Free Elective		3
Credits		15
Year Three		
Fall		
MAT 413	Computer Algebra	3
MAT 425	Numerical Analysis II	3
Cognate 3		3
Humanities Gen Ed		3
Science Gen Ed		3
Credits		15
Spring		
STA 319	Applied Statistics	3
MAT 443	Applied Analysis I	3
ENG 368	Business and Organizational Writing	3
IW Course		3
Gen Ed Elective		3
Credits		15
Year Four		
Fall		
MAT 548	Industrial Mathematics - Continuous Models	3
MAT 554	Scientific Computing	3
STA 505	Mathematical Statistics I	3
Cognate 4		3
Gen Ed Elective		3
Credits		15
Spring		
MAT 491	Internship in Applied Mathematics	3
MAT 575	Complex Analysis I (elective)	3
MAT 549	Industrial Mathematics - Discrete Models	3
MAT 455	Industrial Mathematics Practicum	3
Arts Gen Ed		3
Credits		15
Year Five		
Fall		
MAT 552	Operations Research	3
STA 511	Intro Stat Computing & Data Management	3
500-level MAT or STA Elective		3
Credits		9

Spring		
MAT 553	Stochastic Modeling	3
MAT 555	Industrial Practicum - Continuous Models	3
Credits		6
Total Credits		138