

BS Mathematics: Applied and Computational Mathematics (694432) MAP SHEET

Physical and Mathematical Sciences, Mathematics

For students entering the degree program during the 2024-2025 curricular year

University Core and Graduation Requirements				Suggested Sequence of Courses			
University Core Requirements:				FRESHMAN YEAR		JUNIOR YEAR	
Requirements	# Classes	Hours	Classes	<u>1st Semester</u>		<u>5th Semester</u>	
Religion Cornerstones				First Year Writing	3.00	MATH 320	3.00
Teachings and Doctrines of the Book of Mormon	1	2.00	REL A 275	MATH 112	4.00	MATH 321	1.00
Jesus Christ and the Everlasting Gospel	1	2.00	REL A 250	UNIV 101	2.00	MATH 344	3.00
Foundations of the Restoration	1	2.00	REL C 225	Religion Cornerstone Class	2.00	MATH 345	1.00
The Eternal Family	1	2.00	REL C 200	GE Arts, Letters, Sciences	3.00	ACME Concentration Requirement	3.00
BYU Foundations for Student Success				Total Hours:	14.00	Religion Cornerstone Class	2.00
Foundations for Student Success	1	2.00	UNIV 101	<u>2nd Semester</u>		GE Arts, Letters, Sciences	3.00
The Individual and Society				CS 111	3.00	Total Hours:	16.00
American Heritage	1 to 2	3.00-6.00	from approved list	MATH 113	4.00	<u>6th Semester</u>	
Global and Cultural Awareness	1	3.00	from approved list	MATH 290	3.00	MATH 322	3.00
Skills				Religion Cornerstone Class	2.00	MATH 323	1.00
First Year Writing	1	3.00	from approved list	American Heritage	3.00	MATH 346	3.00
Advanced Written and Oral Communications	1	3.00	from approved list	Total Hours:	15.00	MATH 347	1.00
Quantitative Reasoning	1	4.00	MATH 112*	SOPHMORE YEAR			
Languages of Learning (Math of Language)	1	4.00	MATH 112*	<u>3rd Semester</u>		GE Arts, Letters, Sciences	3.00
Arts, Letters and Sciences (Complete 6 of 7)				MATH 213	2.00	GE Religion	2.00
Civilization 1	1	3.00	from approved list	MATH 215	1.00	ACME Concentration Requirement	3.00
Civilization 2	1	3.00	from approved list	MATH 314	3.00	Total Hours:	16.00
Arts	1	3.00	from approved list	GE Arts, Letters, Sciences	3.00	SENIOR YEAR	
Letters	1	3.00	from approved list	GE Arts, Letters, Sciences	3.00	<u>7th Semester</u>	
Biological Science	1	3.00-4.00	from approved list	ACME Concentration Requirement	3.00	MATH 402	3.00
Physical Science	2	3.00	from approved list	Total Hours:	15.00	MATH 403	1.00
Social Science	1	3.00	from approved list	<u>4th Semester</u>		MATH 436	3.00
Core Enrichment: Electives				MATH 334	3.00	MATH 437	1.00
Religion Electives	3 to 4	6.00	from approved list	ACME Concentration Requirement	3.00	GE Arts, Letters, Sciences	3.00
Open Electives	Variable	Variable	personal choice	Adv Written and Oral Communication	3.00	GE Religion	2.00
Graduation Requirements:				MATH 341	3.00	ACME Concentration Requirement	3.00
Minimum residence hours required		30.00		Math 392 (recommended elect)	2.00	Total Hours:	16.00
Minimum hours needed to graduate		120.00		Religion Cornerstone Class	2.00	<u>8th Semester</u>	
*These classes fill both university core and program requirements				Total Hours:	16.00	MATH 404	3.00
						MATH 405	1.00
						MATH 438	3.00
						MATH 439	1.00
						Global & Cultural Awareness	3.00
						GE Religion	2.00
						ACME Concentration Requirement	3.00
						Total Hours:	16.00

Requirement 1 — Complete 7 Courses

Complete the following pre-core requirements before junior year:

C S 111 - Intro to Computer Science 3.0
 MATH 112 - Calculus 1 4.0
 MATH 113 - Calculus 2 4.0
 MATH 290 - Fundamentals of Mathematics 3.0
 MATH 314 - Calculus of Several Variables 3.0
 MATH 334 - Ordinary Differential Equation 3.0
 MATH 341 - Theory of Analysis 1 3.0

Requirement 2 — Complete 1 Requirement**Requirement 2.1 — Complete 2 Courses**

MATH 213 - Elementary Linear Algebra 2.0
 MATH 215 - Computational Linear Algebra 1.0

Requirement 3 — Complete 4 Courses

Complete the following core requirements during fall semester, junior year:

MATH 320 - Algorithm Design & Opt 1 3.0
 MATH 321 - Algorithm Design & Opt 1 Lab 1.0
 MATH 344 - Mathematical Analysis 1 3.0
 MATH 345 - Mathematical Analysis 1 Lab 1.0

Requirement 4 — Complete 4 Courses

Complete the following core requirements during winter semester, junior year:

MATH 322 - Algorithm Design & Opt 2 3.0
 MATH 323 - Algorithm Design & Opt 2 Lab 1.0
 MATH 346 - Mathematical Analysis 2 3.0
 MATH 347 - Mathematical Analysis 2 Lab 1.0

Requirement 5 — Complete 4 Courses

Complete the following core requirements during fall semester, senior year:

MATH 402 - Model Uncertainty & Data 1 3.0
 MATH 403 - Model Uncertainty & Data 1 Lab 1.0
 MATH 436 - Model Dynamics & Control 1 3.0
 MATH 437 - Model Dynamics & Control 1 Lab 1.0

Completion of an internship in the summer term between the junior and senior years is strongly recommended.

Requirement 6 — Complete 4 Courses

Complete the following core requirements during winter semester, senior year:

MATH 404 - Model Uncertainty & Data 2 3.0
 MATH 405 - Model Uncertainty & Data 2 Lab 1.0
 MATH 438 - Model Dynamics & Control 2 3.0
 MATH 439 - Model Dynamics & Control 2 Lab 1.0

Requirement 7 — Obtain confirmation from your advisement center that you have completed the following:

Students are required to complete a concentration in an area to which the mathematical and computational tools that they are learning can be applied. The list of the Approved Concentrations is found at www.acme.byu.edu/?page_id=85.

Requirement 8 — Obtain confirmation from your advisement center that you have completed the following:

Students are required to take either the GRE Mathematics Subject Test or the Mathematics Major Field Test the last semester before they graduate. The results of these tests do not appear on the transcript or affect the GPA. For more information contact the math department.

THE DISCIPLINE:

Mathematics is a means of dealing with order, pattern, and number as seen in the world around us. The abilities to compute, to think logically, and to take a reasoned approach to solving problems are highly valued in society and are characteristics of any educated person. Mathematics is not just a

body of knowledge, but a process of analysis, reasoning, comparison, deduction, generalization, and problem solving.

A mathematician's stock in trade is the ability to solve problems and explain the solutions to others. Having once determined what the right questions are, solving problems involves analyzing both concrete and abstract situations, relating them to mathematical ideas and using mathematical techniques to work toward solutions. Explaining the solution involves pointing out what has been solved and why the solution is valid.

The Applied and Computational Mathematics Emphasis gives students a solid education in mathematics and, in addition, prepares them to apply mathematical theory to problems that arise in other contexts. They will gain experience in problem formulation, data analysis, computation, and interpreting their results in the context in which the problems arose. The concentration requirement provides them with contextual knowledge which will enable them to identify interesting problems and to implement their results.

CAREER OPPORTUNITIES:

Majors in mathematics (BS) prepare for a wide variety of careers. Some enter graduate school or professional schools and prepare for careers in such fields as college teaching, consulting, research and development, law, medicine, and business administration. Others take positions in government agencies, industrial laboratories, information management firms, or business organizations. All of them spend much time communicating with colleagues about the problems they are solving as they continue to learn more mathematics and share mathematical ideas with others.

INTERNSHIP COORDINATOR:

Rynell Lewis
 283 TMCB
 801-422-5925
rlewis@mathematics.byu.edu

MAP DISCLAIMER

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

DEPARTMENT INFORMATION**FACULTY ADVISOR:**

Darrin Doud
 322 TMCB
 Brigham Young University, Provo, UT 84602
 Telephone: (801) 422-1204

ADVISEMENT CENTER INFORMATION**Computational, Mathematical, & Physical Sciences College
 Advisement Center**

Brigham Young University
 N-181 ESC
 Provo, UT 84602
 Telephone: (801) 422-2674