BS in Mathematics: Applied and Computational Mathematics (694432) MAP Sheet

Physical and Mathematical Sciences, Mathematics

For students entering the degree program during the 2023-2024 curricular year.

University Core and Graduation Requirements

University Core Requirements:

Requirements	#Classes	Hours	Classes
Religion Cornerstones			
Teachings and Doctrine of The Book of Mormon	1	2.0	REL A 275
Jesus Christ and the Everlasting Gospel	1	2.0	REL A 250
Foundations of the Restoration	1	2.0	REL C 225
The Eternal Family	1	2.0	REL C 200
The Individual and Society			
American Heritage	1-2	3-6.0	from approved list
Global and Cultural Awareness	1	3.0	from approved list
Skills			
First Year Writing	1	3.0	from approved list
Advanced Written and Oral Communications	1	3.0	from approved list
Quantitative Reasoning	1	4.0	MATH 112* or 113*
Languages of Learning (Math or Language)	1	4.0	MATH 112* or 113*
Arts, Letters, and Sciences			
Civilization 1	1	3.0	from approved list
Civilization 2	1	3.0	from approved list
Arts	1	3.0	from approved list
Letters	1	3.0	from approved list
Biological Science	1	3-4.0	from approved list
Physical Science	1	3.0	from approved list
Social Science	1	3.0	from approved list
Core Enrichment: Electives			
Religion Electives	3-4	6.0	from approved list
Open Electives	Variable	Variable	personal choice

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (4 hours overlap)

Graduation Requirements:

Minimum residence hours required	30.0
Minimum hours needed to graduate	120.0

Suggested Sequence of Courses

FRESHMAN YEAR

1st Semester

First-year Writing	3.0
MATH 112	4.0
MATH 290	3.0
Biological Science	3.0
Religion Cornerstone course	2.0
Total Hours	**15.0**

2nd Semester

American Heritage	3.0
PHY S 100	3.0
MATH 113	4.0
MATH 213	2.0
MATH 215	1.0
Religion Cornerstone course	2.0
Total Hours	**15.0**

SOPHOMORE YEAR

3rd Semester

MATH 314	3.0
C S 111	3.0
Social Science	3.0
Religion Cornerstone course	2.0
A.C.M.E. Concentration requirement	3.0
Total Hours	**14.0**

4th Semester

MATH 334	3.0
A.C.M.E. Concentration requirement	3.0
Civilization 1	3.0
MATH 341	3.0
Religion Cornerstone course	2.0
Total Hours	**14.0**

JUNIOR YEAR

5th Semester

MATH 320	3.0
MATH 321	1.0
MATH 344	3.0
MATH 345	1.0
Advanced Written & Oral Communication	3.0
A.C.M.E. Concentration requirement	3.0
Religion elective	2.0
Total Hours	**16.0**

6th Semester

MATH 322	3.0
MATH 323	1.0
MATH 346	3.0
MATH 347	1.0
Civilization 2	3.0
Religion Elective	2.0
A.C.M.E. Concentration requirement	3.0
Total Hours	**16.0**

An internship or mentored research project is strongly recommended.

SENIOR YEAR

7th Semester

MATH 402	3.0
MATH 403	1.0
MATH 436	3.0
MATH 437	1.0
Letters	3.0
A.C.M.E. Concentration requirement	3.0
Total Hours	**14.0**

8th Semester

MATH 404	3.0
MATH 405	1.0
MATH 438	3.0
MATH 439	1.0
Religion Elective	2.0
Global & Cultural Awareness	3.0
Arts	3.0
Total Hours	**16.0**

Note: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

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

Physical and Mathematical Sciences College Advisement Center
Brigham Young University
N-181 ESC
Provo, UT 84602
Telephone: (801) 422-2674