BS in Mathematics: Applied and Computational Mathematics (694432) MAP Sheet
Physical and Mathematical Sciences, Mathematics
For students entering the degree program during the 2022-2023 curricular year.

University Core and Graduation Requirements
University Core Requirements:
Requirements#ClassesHoursClasses
Religion Cornerstones
Teachings and Doctrine of The Book of Mormon12.REL A 275
Jesus Christ and the Everlasting Gospel12.REL A 250
Foundations of the Restoration12.REL C 225
The Eternal Family12.REL C 200
The Individual and Society
American Heritage1-23.0from approved list
Global and Cultural Awareness13.0from approved list
Skills
First Year Writing13.0from approved list
Advanced Written and Oral Communications13.0from approved list
Quantitative Reasoning14.MATH 112* or 113*
Languages of Learning (Math or Language)14.MATH 112* or 113*
Arts, Letters, and Sciences
Civilization 113.0from approved list
Civilization 213.0from approved list
Arts13.0from approved list
Letters13.0from approved list
Biological Science13-4.0from approved list
Physical Science13.0from approved list
Social Science13.0from approved list
Core Enrichment: Electives
Religion Electives3-4.0from approved list
Open ElectivesVariableVariableVariableVariable choice
*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (4 hours overlap)
Graduation Requirements:
Minimum residence hours required30.0
Minimum hours needed to graduate120.0
Suggested Sequence of Courses
Freshman Year
1st Semester
First-year Writing3.0
MATH 1124.0
MATH 2903.0
Biological Science3.0
Religion Cornerstone course2.0
Total Hours15.0
2nd Semester
American Heritage3.0
PHY S 1003.0
MATH 1134.0
MATH 2132.0
<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 215</td>
<td>1.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>MATH 3143</td>
<td>3.0</td>
</tr>
<tr>
<td>CS 111.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Social Science</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 3343</td>
<td>3.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>Civilization 1</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 3413</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 3143</td>
<td>3.0</td>
</tr>
<tr>
<td>CS 111.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Social Science</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 320</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 321</td>
<td>1.0</td>
</tr>
<tr>
<td>MATH 3413</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 3451</td>
<td>3.0</td>
</tr>
<tr>
<td>Advanced Written &amp; Oral Communication</td>
<td>3.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion elective</td>
<td>2.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 322</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 323</td>
<td>1.0</td>
</tr>
<tr>
<td>MATH 3463</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 3471</td>
<td>1.0</td>
</tr>
<tr>
<td>Civilization 2</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Elective</td>
<td>2.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 402</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 403</td>
<td>1.0</td>
</tr>
<tr>
<td>MATH 4363</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 4371</td>
<td>1.0</td>
</tr>
<tr>
<td>Letters</td>
<td>3.0</td>
</tr>
<tr>
<td>A.C.M.E. Concentration requirement</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 4043</td>
<td>3.0</td>
</tr>
</tbody>
</table>
MATH 405.0
MATH 438.0
MATH 439.0
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.

BS in Mathematics: Applied and Computational Mathematics (694432) 2022-2023 Program Requirements (70 - 75 Credit Hours)

requirement 1 Complete 7 courses
Complete the following pre-core requirements before junior year:
C S 111 - Introduction 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 Equations 3.0
MATH 341 - Theory of Analysis 1 3.0

requirement 2 Complete 1 option
option 2.1 Complete 1 course
MATH 313 - (Not currently offered)
option 2.2 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 and Optimization 1 3.0
MATH 321 - Algorithm Design and Optimization 1 Laboratory 1.0
MATH 344 - Mathematical Analysis 1 3.0
MATH 345 - Mathematical Analysis 1 Laboratory 1.0

requirement 4 Complete 4 courses
Complete the following core requirements during winter semester, junior year:
MATH 322 - Algorithm Design and Optimization 2 3.0
MATH 323 - Algorithm Design and Optimization 2 Laboratory 1.0
MATH 346 - Mathematical Analysis 2 3.0
MATH 347 - Mathematical Analysis 2 Laboratory 1.0

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

requirement 5 Complete 4 courses
Complete the following core requirements during fall semester, senior year:
MATH 402 - Modeling with Uncertainty and Data 1 3.0
MATH 403 - Modeling with Uncertainty and Data 1 Laboratory 1.0
MATH 436 - Modeling with Dynamics and Control 1 3.0
MATH 437 - Modeling with Dynamics and Control 1 Laboratory 1.0

requirement 6 Complete 4 courses
Complete the following core requirements during winter semester, senior year:
MATH 404 - Modeling with Uncertainty and Data 2 3.0
MATH 405 - Modeling with Uncertainty and Data 2 Laboratory 1.0
MATH 438 - Modeling with Dynamics and Control 2 3.0
MATH 439 - Modeling with Dynamics and Control 2 Laboratory 1.0

requirement 7
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 https://acme.byu.edu/concentrations-in-acme.

requirement 8
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

BS in Mathematics: Applied and Computational Mathematics (694432) 2022-2023

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