Mathematics - Actuarial Science Emphasis, B.S.

Mathematics degrees allow for a wide variety of employment options. The following careers are very mathematics centered, though in many cases additional training beyond a mathematics degree (or at least beyond a B.S. Mathematics degree) is needed to qualify for employment in these fields: actuarial work, education, research analysis, cryptology, systems analysis, robotics engineering, design modeling (creating cost efficient models), geomatics engineering, photogrammatism, stock trading, biomathematics, accounting or auditing, population ecology, aspects of forensic analysis and some types of computer programming design. There are also jobs for mathematics graduates in the federal government, mainly in the department of defense. The degree required depends on the type of job in the areas mentioned, and the salary level.

Matriculation Requirements

1. Completion of MATH 1210 Calculus I QL and MATH 1220 Calculus II (or equivalent) with an overall GPA of 2.5 or better
2. Student must meet with the Math Department advisor and declare an intent to major in Mathematics

Program Requirements

Code	Title	Credit Hours
Total Credit Hours		**120**
Mathematics Requirements		**90 Credits**
Complete the requirements		90
Emphasis Requirements		**30 Credits**
ECON 2010	Principles of Economics I SS	3
ECON 2020	Principles of Economics II SS	3
Complete one of the following:		3
ACC 2110 & ACC 2120	Principles of Accounting I and Principles of Accounting II (6)	
ACC 3000	Financial Managerial and Cost Accounting Concepts (3)	
FIN 3100	Principles of Finance	3
MATH 3750	Financial Mathematics	3
MATH 4750	Fundamentals of Actuarial Mathematics	3
STAT 4000	Applied Regression and Time Series WE	3
STAT 4710	Mathematical Statistics-Probability and Statistics	3
STAT 4720	Mathematical Statistics-Statistical Inference	3
Emphasis Elective Requirements:		
Complete 3 credits chosen from the following:		3
MATH 3210	Complex Variables (3)	
MATH 3320	Graph Theory and its Applications (3)	
MATH 3400	Partial Differential Equations (3)	
MATH 3640	Introduction to Optimization (3)	
MATH 4100	Differential Geometry of Curves and Surfaces (3)	
MATH 4220	Advanced Calculus II (3)	
MATH 4250	Introduction to Dynamical Systems (3)	
MATH 4310	Introduction to Modern Algebra I (3)	
MATH 4320	Introduction to Modern Algebra II (3) [1]	
MATH 4330	Theory of Linear Algebra (3)	
MATH 4340	Introduction to Number Theory (3)	
MATH 4510	Foundations of Topology (3)	
MATH 4610	Introduction to Numerical Analysis I (3)	
MATH 4620	Introduction to Numerical Analysis II (3) [1]	
MATH 481R	Internship in Mathematics (1-4)	
MATH 489R	Undergraduate Research in Mathematics (1-3)	
MATH 490R	Topics in Mathematics (2-3)	

1

Requires completion of a prerequisite course, which fulfills elective requirements.

Core Requirements

Code	Title	Credit Hours
Total Credit Hours		**90**
General Education Requirements		**38 Credits**
ENGL 1010	Introduction to Academic Writing CC	3
or ENGH 1005	Literacies and Composition Across Contexts CC	
ENGL 2010	Intermediate Academic Writing CC	3
MATH 1210	Calculus I QL	4
or MATH 121H	Calculus I QL	
Complete one of the following:		3
HIST 2700 & HIST 2710	US History to 1877 AS and US History since 1877 AS (6)	
HIST 1700	American Civilization AS (3)	
HIST 1740	US Economic History AS (3)	
POLS 1000	American Heritage AS (3)	
POLS 1100	American National Government AS (3)	
Complete the following:		
PHIL 2050	Ethics and Values IH	3
HLTH 1100	Personal Health and Wellness TE	2
or EXSC 1097	Fitness for Life TE	
Distribution Courses:		
Biology		3
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
Complete one of the following:		3
PHYS 2220 & PHYS 2225	Physics for Scientists and Engineers II PP and Physics for Scientists and Engineers II Lab (5) (Both 2220 and 2225 required for Mathematics and Applied Mathematics Emphasis)	
One other biology or Physical Science Distribution (Required for Applied Mathematics Emphasis)		
Humanities		3
Fine Arts		3
Social/Behavioral Science		3
Discipline Core Requirements		**31 Credits**
CS 1400	Fundamentals of Programming	3
STAT 2050	Introduction to Statistical Methods	4
STAT 2060	Introduction to Statistical Computing	1
MATH 1220	Calculus II	4
or MATH 122H	Calculus II	
MATH 2210	Calculus III	4
or MATH 221H	Calculus III	
MATH 2270	Linear Algebra	3
MATH 2280	Ordinary Differential Equations	3
MATH 3250	Introduction to Advanced Calculus WE	3
MATH 3300	Foundations of Abstract Algebra	3
MATH 4210	Advanced Calculus I [1]	3
Elective Requirements		**21 Credits**

Complete 12 credits of upper division electives [2]		12
Complete 9 credits of upper or lower division electives [2]		9

[1]

Students planning to do graduate work in mathematics should take both of the year-long sequences MATH 4210 Advanced Calculus I, MATH 4220 Advanced Calculus II, and MATH 4310 Introduction to Modern Algebra I, MATH 4320 Introduction to Modern Algebra II, and acquire a reading knowledge of at least one foreign language chosen from French, German, or Russian.

[2]

Elective courses may NOT include MATH 3100, MATH 3200, MATH 3010, MATH 3030, MATH 4030, or MATH 4040.

Graduation Requirements

1. Completion of a minimum of 120 semester credits with at least 40 credit hours in upper-division courses.
2. Overall grade point average of 2.0 (C) or above, a minimum GPA of 2.4 in all MATH and STAT courses listed above, with no grade lower than a "C" in all listed PHYS, STAT, and MATH courses (substitutions may be granted for some elective courses).
3. Residency hours-- minimum of 30 credit hours through course attendance at UVU, with at least 10 hours earned in the last 45 hours.
4. Completion of general education and specified departmental requirements.
5. Complete an exit survey administered by the Mathematics Department Advisor.
6. Successful completion of at least one Global/Intercultural course.

Graduation Plan

This graduation plan is a sample plan and is intended to be a guide. Your specific plan may differ based on your Math and English placement and/or transfer credits applied. You are encouraged to meet with an advisor and set up an individualized graduation plan in Wolverine Track (http://www.uvu.edu/wolverinetrack/).

First Year		
Semester 1		**Credit Hours**
MATH 1210 or MATH 121H	Calculus I QL or Calculus I QL	4
Fine Arts GE		3
STAT 2050	Introduction to Statistical Methods	4
ENGL 1010 or ENGH 1005	Introduction to Academic Writing CC or Literacies and Composition Across Contexts CC	3
	Credit Hours	**14**
Semester 2		
MATH 1220 or MATH 122H	Calculus II or Calculus II	4
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
ECON 2010	Principles of Economics I SS	3
STAT 2060	Introduction to Statistical Computing	1
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE or Fitness for Life TE	2
	Credit Hours	**15**
Second Year		
Semester 3		
MATH 2210 or MATH 221H	Calculus III or Calculus III	4
MATH 2270	Linear Algebra	3
ECON 2020	Principles of Economics II SS	3
ENGL 2010	Intermediate Academic Writing CC	3
Social/Behavioral GE		3
	Credit Hours	**16**
Semester 4		
MATH 2280	Ordinary Differential Equations	3
STAT 4000	Applied Regression and Time Series WE	3
MATH 3250	Introduction to Advanced Calculus WE	3
ACC 3000	Financial Managerial and Cost Accounting Concepts	3
History GE		3
	Credit Hours	**15**

Third Year

Semester 5

MATH 3750	Financial Mathematics	3
CS 1400	Fundamentals of Programming	3
FIN 3100	Principles of Finance	3
PHIL 205G	Ethics and Values IH GI	3
Elective		3
	Credit Hours	**15**

Semester 6

MATH 3300	Foundations of Abstract Algebra	3
Biology GE		3
Additional Science GE		3
STAT 4710	Mathematical Statistics-Probability and Statistics	3
Upper Division Elective		3
	Credit Hours	**15**

Fourth Year

Semester 7

MATH 4750	Fundamentals of Actuarial Mathematics	3
MATH 4210	Advanced Calculus I	3
Elective		3
Humanities GE		3
Upper Division Elective		3
	Credit Hours	**15**

Semester 8

STAT 4720	Mathematical Statistics-Statistical Inference	3
MATH Elective		3
Upper Division Elective		3
Upper Division Elective		3
Elective		3
	Credit Hours	**15**
	Total Credit Hours	**120**

Program Learning Outcomes

1. Knowledge of calculus, real and complex analysis, differential equations, linear and abstract algebra, basic probability, and a broad knowledge base of other elective topics including topology, geometry, number theory, numerical analysis and statistics.
2. An awareness of how to apply and model real situations with mathematics, and the ability to formulate and understand logical arguments.
3. The ability to communicate mathematics effectively, both verbally and in writing, expressing clear logical proofs of mathematical hypotheses and constructing well defined counterexamples to false statements.