Undergraduate Degree Programs – MATH-SA (Statistics/Actuarial Science Track of Mathematics Program)

The Department of Mathematical Sciences offers a major leading to the degrees of Bachelor of Arts or Bachelor of Science in Mathematics. In the first years, all majors take the same core courses. Once these introductory courses are completed, in the past the student chose one of two tracks: Statistics/Actuarial Sciences or Mathematics.

This document contains information about the Statistics/Actuarial Science track of the Mathematics major for existing students in this track. **If you are a new student, this document is not for you** – please check the math department website for information on the new separate Statistics major.

Overall, completion of the major requires:

- Overall GPA of 2.0 or better;
- GPA of 2.0 or better in all math courses;
- At least 42 MATH/STAT credits for BA, or 48 MATH/STAT credits for BS;
- Grade of C- or better in all courses used to fulfill the 42 or 48 credit requirement;
- Completion of coursework satisfying the requirements for the chosen degree and track (below).

Credits from 1000 and 2000-level courses outside of the core course requirements cannot be counted toward the 42/48 credits necessary for the major.

For the Bachelor of Science, a 6-credit sequence in another scientific discipline is also required.

Note: in the course lists below, all pre-requisites must be completed with a grade of C- or better.

Core Course Requirements

All courses in this list are required for all math majors (BA or BS, math track or stats/actuary track):

Course Number	Course Title	Pre-requisites	Typically Offered	Credit Hours
MATH 1060 or 1061	Calculus I	Placement test or	Fall, Spring, Summer	4

		MATH 1022, 1024, or 1026		
MATH 1062	Calculus II	MATH 1061	Fall, Spring, Summer	4
MATH 2063	Multivariable Calculus	MATH 1062	Fall, Spring, Summer	4
MATH 2073 or 2074	Differential Equations or Dynamical Systems	MATH 1062	Fall, Spring, Summer	3
MATH 2076	Linear Algebra	MATH 1062	Fall, Spring, Summer	3
STAT 2037	Probability and Statistics I	MATH 1062	Fall, Spring, Summer	3
MATH 3001	Intro to Abstract Math	MATH 2076	Fall, Spring	3
MATH 5001 or 5002	Math Capstone	Permission of Department	Fall, Spring	3

Table 1: Core Course Requirements

About the capstone requirement: All majors must complete a capstone that extends their mathematical knowledge beyond their coursework and/or synthesizes knowledge from multiple major courses. Students should plan to complete their capstone in their final semester of the program. There are two capstone options, Capstone Project (MATH 5001) and Capstone Seminar (MATH 5002).

- Capstone Project is for students who have a specific project in mind and a faculty member who has agreed to oversee their project. The student and professor work out the details of the capstone between themselves and the faculty mentor determines a grade.
- Capstone Seminar is an alternative for students who don't have a specific project or mentor in mind. The Seminar meets through the semester as a typical course does, and students work together through the process of completing their capstones.

To register for either capstone, contact the Undergraduate Program Director for permission (contact info at the end of this document).

Statistics/Actuarial Science Track (BA or BS)

These courses are required for all students in the Stats/Actuarial Science track:

Course Number	Course Title	Pre-requisites	Typically Offered	Credit Hours
STAT 3038	Probability and Statistics II	STAT 2037	Fall, Spring	3
STAT 4121	Mathematical Statistics I	MATH 2063, MATH 2076, and STAT 2037	Fall	3
STAT 4131	Regression Analysis and Statistical Learning	MATH 2063, MATH 2076, and STAT 2037	Fall	3
STAT 5132	Design and Analysis of Experiments	STAT 4131 or STAT 5131	Spring	3

Table 2: Stats/Actuary Additional Requirements

Students interested in actuarial science are strongly encouraged to take these courses as well:

Course Number	Course Title	Pre-requisites	Typically Offered	Credit Hours
MATH 2010	Actuarial Science Seminar	none	Fall	2

MATH 4010	Actuary Exam Preparation Seminar	none	Fall, Spring	1

Table 3: Actuarial Science Seminars

Elective courses: choose at least one for BA, at least two for BS. Courses with an asterisk (*) are encouraged for students interested in actuarial science:

Course Number	Course Title	Pre-requisites	Typically Offered	Credit Hours
STAT 3041	Data Science and Statistics	STAT 2037		3
MATH 4008*	Intro to Probability	MATH 2063 and STAT 2037	Fall, Spring	3
MATH 4009*	Financial Math for Actuarial Sciences	STAT 2037	Fall, Spring	3
STAT 4021	Special Topics	Permission of Instructor	Rarely	
STAT 5122*	Mathematical Statistics II	STAT 4121 or STAT 5121	Spring	3
STAT 5141*	Time Series	STAT 3038 or STAT 5132	Fall	3
STAT 5142	Survival Analysis and Logistic Regression	STAT 5131	Spring	3
STAT 5143	Applied Bayesian Analysis	STAT 5121	Spring	3
STAT 5144	Nonparametric Statistics	STAT 5121	Fall	3
STAT 5145	Statistical Computing with SAS and S-plus	STAT 3038	Irregularly	3
STAT 5151	Statistical Consulting	Permission of instructor	Fall, Spring	3
STAT 5171	Statistics and Machine Learning	STAT 5121 and STAT 5131	Spring	3

Table 4: Stats/Actuary Electives

For BS, students can take a third elective from above list or any math elective from the Mathematics track options. You will find these options in Catalyst.

Advice to Majors

- Students in any program or track should complete MATH 1062 as early as possible. It is required for almost all other courses in the major. For Statistics/Actuarial Science students, it is recommended to take STAT 2037 as early as possible.
- Students are encouraged to learn a programming language.
- Students pursuing a career in actuarial sciences should take the P and F/M actuarial exams during their time in this program.
- There are several scholarship funds open only to math majors. There is a call for applications every year, usually early spring semester. Please apply!

Contact

For more information, contact our Undergraduate Program Director:

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