

# MAJOR IN MATHEMATICS - ACTUARIAL SCIENCE AND RISK MANAGEMENT CONCENTRATION

## Admission

Students who are interested in the Actuarial Science & Risk Management (ASRM) Program must complete an application for admission to the program. Admission to Towson University does not guarantee admission to the ASRM Program. The Application Form may be obtained from the Mathematics Office or downloaded from this website (<https://www.towson.edu/fcsm/departments/mathematics/undergrad/math/actuarial>).

To be admitted to the concentration, students are required to meet the following two requirements:

1. Students must have a grade point average of at least 3.0 in mathematics.
2. Students must also meet one of the following requirements:
  - a. Completed MATH 273/MATH 283 (Calculus I) and MATH 274/MATH 284 (Calculus II) with a grade of at least B in both.
  - b. Received a score of 4 or 5 in AP Calculus AB or BC.
  - c. Received a passing score on at least one SOA exam.

Degree candidates intending to be in the ASRM program are designated as pre-ASRM until admitted into the concentration. These students will also be assigned an adviser from the ASRM faculty and are encouraged to communicate with their faculty advisor regularly to evaluate their progress in admission.

Students who have not met the admission requirements will not be able to enroll in MATH 438 (Actuarial Models) and MATH 485 (Introduction to Mathematical Finance). Students who take an ASRM course listed above before being admitted to the ASRM concentration will be disenrolled from the course.

Note: Students not satisfying any of the requirements may petition to the Director of ASRM program to be admitted into the program.

## Continuation

To continue in the ASRM concentration, students need to receive at least a grade "B" in MATH 331 (Probability) and maintain a total grade point average of at least 3.0 in the required courses for the ASRM concentration.

Students who fail to meet the criteria for continuation will be placed in the pre-ASRM Concentration. Students will not be allowed to enroll in MATH 438 (Actuarial Models) and MATH 485 (Introduction to Mathematical Finance) until they achieve a total GPA of at least 3.0 in the required courses for the ASRM concentration and/or receive at least a grade "B" in MATH 331 (Probability).

If students enroll in these courses before meeting the criteria for continuation during the preregistration period, they will be disenrolled from the course(s). Once students are in the ASRM program and have successfully enrolled in MATH 438 (Actuarial Models) or MATH 485

(Introduction to Mathematical Finance), they cannot be placed in pre-ASRM.

The Society of Actuaries has recognized Towson University as a *Center of Actuarial Excellence (CAE)*. There are eight criteria for this designation, including curriculum, faculty composition, graduate quality, connection to industry, and research/scholarship.

In addition to the Core Curriculum and common requirements for all Math majors, the Actuarial Science and Risk Management Concentration requires 86 units (83 shown below plus ENGL 317, 3 units), completed with a grade equivalent of 2.00 or higher.

Students must complete the Core Curriculum requirements in addition to the requirements for a concentration.

The following are common requirements for all Mathematics concentrations:

Code	Title	Units
MATH 265	ELEMENTARY LINEAR ALGEBRA	4
MATH 267	INTRODUCTION TO ABSTRACT MATHEMATICS	4
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
MATH 275	CALCULUS III	4
<b>Select one of the following courses:</b> <sup>1</sup>		3-4
MATH 369	INTRODUCTION TO ABSTRACT ALGEBRA	
MATH 463	LINEAR ALGEBRA	
MATH 473	INTRODUCTORY REAL ANALYSIS	
Total Units		23-24

<sup>1</sup> Student in the Applied Mathematics concentration must take MATH 369.

## Actuarial Science and Risk Management Concentration Requirements

Code	Title	Units
<b>Actuarial Science &amp; Risk Management Concentration Required Courses</b>		
ACCT 201 or ACCT 211	PRINCIPLES OF FINANCIAL ACCOUNTING HONORS ACCOUNTING PRINCIPLES I	3
ACCT 202 or ACCT 212	PRINCIPLES OF MANAGERIAL ACCOUNTING HONORS ACCOUNTING PRINCIPLES II	3
COSC 236	INTRODUCTION TO COMPUTER SCIENCE I	4
ECON 201 & ECON 202	MICROECONOMIC PRINCIPLES and MACROECONOMIC PRINCIPLES	6
FIN 331	PRINCIPLES OF FINANCIAL MANAGEMENT	3
FIN 333	INVESTMENTS AND EQUITY SECURITY ANALYSIS	3
MATH 265	ELEMENTARY LINEAR ALGEBRA	4
MATH 267	INTRODUCTION TO ABSTRACT MATHEMATICS	4
MATH 273	CALCULUS I	4
MATH 274	CALCULUS II	4
MATH 275	CALCULUS III	4
MATH 312	THEORY OF INTEREST	4
MATH 331	PROBABILITY	4
MATH 332	MATHEMATICAL STATISTICS	3

MATH 337	APPLIED REGRESSION AND TIME SERIES PREDICTIVE MODELING	4
MATH 369	INTRODUCTION TO ABSTRACT ALGEBRA	4
MATH 438	LONG-TERM ACTUARIAL MODELS I	3
MATH 439	COMPUTATIONAL PROBABILITY MODELS	3
MATH 448	LONG-TERM ACTUARIAL MODELS II	3
MATH 485	MATHEMATICAL FINANCE	3
MATH 486	RISK MANAGEMENT AND FINANCIAL ENGINEERING	3
MATH 442	SHORT-TERM ACTUARIAL MODELS	4
MATH 498	SENIOR SEMINAR: ACTUARIAL SCIENCE AND RISK MANAGEMENT	3
<b>Total Units</b>		<b>83</b>

Note: ENGL 317 must be taken to fulfill the Core Curriculum requirement of English Composition.

## Suggested Four-Year Plan

Based on course availability and student needs and preferences, the selected sequences will probably vary from those presented below. Students should consult with their adviser to make the most appropriate elective choices.

### Freshman

Term 1	Units Term 2	Units
COSC 236	4 ACCT 201 <sup>1</sup>	3
MATH 273 (Core 3)	4 COMM 131 (Core 5)	3
Core 1 (or Core 2)	3 MATH 265	4
Core 4	3 MATH 274	4
Core 10	3 Core 1 (or Core 2)	3
		<b>17</b>

### Sophomore

Term 1	Units Term 2	Units
ACCT 202 <sup>1</sup>	3 ECON 201 (Core 6) <sup>2</sup>	3
MATH 275	4 MATH 267	4
MATH 312 (Exam FM)	4 MATH 331 (Exam P)	4
Core 7	4 Core 8	4
(Students are advised to prepare for and take the SOA/CAS Exam FM at the end of the Fall Term)	(Students are advised to prepare for and take the SOA/CAS Exam P at the end of the Spring Term)	
		<b>15</b>

### Junior

Term 1	Units Term 2	Units
ECON 202 <sup>2</sup>	3 ENGL 317 (Core 9)	3
MATH 369, 463, or 473	4 FIN 331 <sup>1</sup>	3
MATH 332 <sup>3</sup>	3 MATH 439	3
MATH 438 <sup>4</sup>	3 MATH 448 <sup>4</sup>	3
MATH 390 <sup>5</sup>	3 Core 12	3
(Students are advised to prepare for and take the SOA Exam LTAM at the end of the Spring Term)		
		<b>16</b>

### Senior

Term 1	Units Term 2	Units
MATH 337 <sup>7</sup>	4 MATH 486 <sup>6</sup>	3
MATH 442 <sup>8</sup>	4 MATH 498	3
MATH 485 <sup>6</sup>	3 Core 13	
Core 11	3 Core 14	3
(Students are advised to prepare for and take the SOA/CAS Exam IFM at the end of either the Fall or Spring Term)	(Students are advised to prepare for and take the SOA/CAS Exam STAM at the end of the Spring Term)	
Elective		3
		<b>14</b>

### Total Units 121

- 1 VEE for Accounting and Finance
- 2 VEE for Economic
- 3 VEE for Mathematical Statistics
- 4 Exam LTAM
- 5 Seminar
- 6 Exam IFM
- 7 Exam SRM & Exam PA
- 8 Exam STAM

1. Demonstrate knowledge of the properties of numbers and sets.
2. Demonstrate skills and knowledge of appropriate technology used in solving mathematical problems.
3. Demonstrate skills and knowledge of the basic concepts of calculus.
4. Demonstrate skills and knowledge of linear and abstract algebra.
5. Demonstrate skills and knowledge of basic probability and/or statistics.