

ACTUARIAL MATHEMATICS (B.A.)

The courses offered by the Department of Mathematics serve several purposes; they supply the mathematical preparation necessary for students specializing in the physical, life or social sciences, in business administration, in engineering, and in education; they provide a route by which students may achieve a level of competence to do research in any of several special mathematical areas; they allow students to prepare themselves for work as mathematicians and statisticians in industry and government; and they give an opportunity to all inquisitive students to learn something about modern mathematical ideas.

Admission Requirements

Admission requirements for this program are satisfied by the general requirements for undergraduate admission (<http://bulletins.wayne.edu/undergraduate/general-information/admission/>) to the University. Undergraduates declaring a mathematics major are strongly encouraged to meet with a departmental advisor before doing so. After a student's acceptance as a major, a student should consult a Departmental advisor at least once a semester to verify progress.

Program Requirements

Students must complete 120 credits in coursework including satisfaction of the University General Education Requirements (<http://bulletins.wayne.edu/undergraduate/general-information/general-education/>) and the College of Liberal Arts and Sciences Group Requirements (<http://bulletins.wayne.edu/undergraduate/college-liberal-arts-sciences/bachelors-degree-requirements/>), as well as the departmental major requirements cited below. All coursework must be completed in accordance with the regulations of the University (<http://bulletins.wayne.edu/undergraduate/general-information/academic-regulations/>) and the College (<http://bulletins.wayne.edu/undergraduate/college-liberal-arts-sciences/academic-regulations/>) governing undergraduate scholarship and degrees.

It is each student's responsibility to learn the requirements, policies, and procedures governing the program the student is following and to act accordingly. Students should consult the Department of Mathematics' undergraduate academic advisor on a regular basis. Although the advisor will provide assistance, the responsibility for fulfilling degree requirements remains with the student.

Residency Requirement

A minimum of 15 credits of major requirements at or above MAT or STA 5030 must be taken at Wayne State University. This includes courses that are considered equivalent to the Mathematics Department's MAT or STA courses and that are approved by the Mathematics Department to meet a major requirement.

Minimum Grade Requirements

The following grade requirements must be satisfied in the major.

- C- or better in all required coursework.
- C or better average for all coursework.

Notes

1. STA courses previously designated by MAT (for example STA 2210 was previously labelled MAT 2210) are the same courses and meet the same requirements.

2. Although this policy is found in the College of Liberal Arts and Sciences (CLAS) requirements, it is worth noting that if a student is majoring in a CLAS major, they must obtain at least one minor that has 3 unique courses from the major. This means that at least 3 courses used to complete requirements in the minor must not be used to complete requirements in the major.

3. The required courses listed are the minimum that students should complete. Students are encouraged to take more courses in order to strengthen their background and enhance their prospects for employment and/or graduate school.

Course Requirements

Code	Title	Credits
Cognate Courses:		
Select one of the following Computer Science options:		3-4
CSC 1100	Problem Solving and Programming	
CSC 2000	Introduction to C++ Programming Language ²	
CSC 2110	Computer Science I	
ECO 2010	Principles of Microeconomics ³	4
ECO 2020	Principles of Macroeconomics ⁴	4
FIN 3290	Business Finance ⁵	3
Cognate Courses - Credit Subtotal:		14-15
Mathematics and Statistics Courses:		
MAT 2010	Calculus I	4
MAT 2020	Calculus II	4
MAT 2030	Calculus III	4
MAT 2250	Elementary Linear Algebra	3
Select one of the following two options (MAT 2350 is preferred if available, and is 3 credits rather than 4)		3-4
MAT 2350	Elementary Differential Equations	
MAT 2150	Differential Equations and Matrix Algebra	
STA 5030	Statistical Computing and Data Analysis	3
MAT 5700	Introduction to Probability Theory	4
MAT 5740 & MAT 5993	The Theory of Interest and Writing Intensive Course in Mathematics ¹	3
STA 5800	Introduction to Mathematical Statistics	4
Select two of the following options:		6-7
MAT 5540	Topological Data Analysis	
MAT 5710	Introduction to Stochastic Processes	
MAT 5750	Mathematics of Finance	
MAT 5770	Mathematical Models in Operations Research	
STA 5820	Introduction to Data Science	
STA 5830	Applied Time Series	
STA 6840	Applied Regression Analysis	
MAT 5890	Special Topics in Mathematics (The topic must be approved by the Department of Mathematics)	
ECO 5270	Games of Strategy	
Math and Statistics Courses - Credit Subtotal:		38-40
Major Courses - Credit Total:		52-55

¹ MAT 5993 is linked to MAT 5740. These two courses must be taken simultaneously.

² CSC 2000 is the only option that does not have a computer science course prerequisite.

³ With ECO 2020, this course meets a VEE, if a B- or better is achieved in each course.

⁴ With ECO 2010, this course meets a VEE, if a B- or better is achieved in each course.

⁵ With ACC 3010 (recommended, but not required course) this course meets a VEE, if a B- or better is achieved in each course.

Actuarial Mathematics Career Information

Various Careers

Actuaries measure and manage risk. Students who complete the Actuarial Mathematics program are prepared for a variety of careers, and not just in the actuarial field. Students can expect to work in fields such as insurance, banking, investments, government, energy, e-commerce, marketing, employee benefits, product development, enterprise risk management, predictive analytics, consulting and more.

Actuarial Validation by Educational Experience (VEE) and Recommended Coursework

VEEs are subjects that can be learned through coursework, as well as other methods, that cover content that is no longer on the actuarial exams, but is essential for success as an actuary. In order to achieve higher levels in the actuary field, VEEs are required by the Society of Actuaries and the Casualty Actuarial Society. Wayne State offers many courses that meet VEE requirements, and most of those courses are part of the Actuarial Mathematics major. For instance, ECO 2010 and ECO 2020 meet the Economics VEE, while FIN 3290 and ACC 3010 meet the Accounting and Finance VEE. ACC 3010 (Accounting) is not required for the major, but highly recommended. In addition, statistics courses in the major can meet VEE requirements and the Mathematics Department is working to increase the number that do. Students who receive a minimum of a B- in these courses can receive credit for the associated VEE. See the Society of Actuaries (<https://www.soa.org/>) or the Casualty Actuarial Society (<https://www.casact.org/>) for more about VEEs and be sure to speak with your actuarial major advisor for more information.

Actuarial Exams

In addition to VEEs, there is a series of actuarial exams that allow actuaries to move up in the field and gain credentials. Students who aspire to become actuaries should pass at least the first two actuarial exams and complete the Accounting & Finance and Economics VEEs before getting their first job as an actuary. Although some graduates will find jobs in the actuarial field without these credentials, it is highly recommended that these requirements be met while completing the B.A. in Actuarial Mathematics in order to be best prepared for employment after graduation. It is also recommended that at least one exam is passed before getting an internship in the actuarial field. Exams can be found through the Society of Actuaries or the Casualty Actuarial Society. Although they each have their own set of exams, they are very similar, and prospective actuaries can choose either organization to complete their exams.