Mathematics: Statistics/Actuarial Science B.A.

Mathematics: Statistics/Actuarial Science Major

The B.A. Mathematics: Statistics/Actuarial Science major requires a minimum of 120 total hours to graduate. This total includes UNIFI/ General Education requirements and the following specified major requirements, plus electives to complete the minimum of 120 hours.

The major is available in two emphases, the Statistics emphasis and the Actuarial Science emphasis. Each emphasis requires completion of the common core, the seminar/research requirement, the core for the chosen emphasis (Statistics or Actuarial Science), and 6 hours of electives that do not duplicate course work chosen to meet the chosen emphasis (Statistics or Actuarial Science) core requirement.

Required		
Mathematics:		
Common core:		15
MATH 1420	Calculus I *	
MATH 1421	Calculus II	
MATH 2422	Calculus III	
MATH 2500	Linear Algebra for Applications	
Statistics/Actuarial Science core:		9
STAT 1772	Introduction to Statistical Methods	
or STAT 1774	Introductory Statistics for Life Sciences	
MATH/STAT 3752	Introduction to Probability	
STAT 3775/5775	Introduction to Mathematical Statistics	
Computer Programming:		3-4
Select one of the following:		
CS 1160	C/C++ Programming	
CS 1510	Introduction to Computing	
STAT 4772/5772	Statistical Computing I	
Seminar/research:		1-3
MATH 4900	Senior Mathematics Seminar	
or MATH 4990	Undergraduate Research in Mathematics	
Select and complete ONE of the following Emphasis Core:		9
Statistics Emphasis Core:		
Select three from the following:		
STAT 3771/5771	Applied Statistical Methods for Research	
STAT 3776/5776	Regression Analysis	
STAT 4773/5773	Design and Analysis of Experiments	
STAT 4779/5779	Applied Multivariate Statistical Analysis	
STAT 4782/5782	Statistical Computing II	
STAT 4784/5784	Introduction to Machine Learning	
STAT 4786/5786	Statistics for Risk Modeling	
Actuarial Science Emphasis Core:		
Select three from the following:		
ACT SCI/MATH 3780	Mathematics of Finance	
ACT SCI 4735/5735	Actuarial Mathematics	
ACT SCI 4739/5739	Topics in Actuarial Science	
STAT 4784/5784	Introduction to Machine Learning	
STAT 4786/5786	Statistics for Risk Modeling	
ACT SCI 4788/5788	Loss Models	
Electives		**6**
Select two electives from the following list. The same course cannot be used to satisfy both the emphasis core and elective requirement.		
STAT 3771/5771	Applied Statistical Methods for Research	
STAT 3776/5776	Regression Analysis	
STAT 3778/5778	Spatial Data Analysis	
STAT 4772/5772	Statistical Computing I	
STAT 4773/5773	Design and Analysis of Experiments	
STAT 4777/5777	Statistical Quality Assurance Methods	
STAT 4779/5779	Applied Multivariate Statistical Analysis	
STAT 4782/5782	Statistical Computing II	
STAT 4784/5784	Introduction to Machine Learning	
STAT 4786/5786	Statistics for Risk Modeling	
ACT SCI 3731	Actuarial Examination Preparation **	
ACT SCI 4735/5735	Actuarial Mathematics	
ACT SCI 4739/5739	Topics in Actuarial Science	
ACT SCI 4785/5785	Introduction to Financial Engineering	
ACT SCI 4788/5788	Loss Models	
MATH 3440/5440	Numerical Analysis	
MATH 3780/5780	Mathematics of Finance	
Total Hours		**43-46**

* MATH 1420 has prerequisite of satisfactory score on mathematics placement exam or subsequent remediation.

**ACT SCI 3731 may be repeated for credit for preparation for different exams, however only 3 hours will count toward the Statistics/Actuarial Science major.

Four-Year Plan

Mathematics: Statistics/Actuarial Science, B.A.

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester schedule to include UNIFI/General Education program and/or university elective hours required.

Course	Title	Hour
Freshman		
Fall		
ECON 1041	Principles of Macroeconomics	3
ENGLISH 1005	College Writing and Research	3
MATH 1420	Calculus I	4
MGMT 2080	Introduction to Information Systems	3
STAT 1772	Introduction to Statistical Methods	3
	Hours	**16**
Spring		
COMM 1000	Oral Communication	3
ECON 1051	Principles of Microeconomics	3
MATH 3780/5780	Mathematics of Finance	3
MATH 1421	Calculus II	4
UNIFI/General Education or University Electives		3
	Hours	**16**
Sophomore		
Fall		
ACCT 2120	Principles of Financial Accounting	3
ECON 1011	Statistics for Business Analytics (or STAT 3771 Applied Statistical Methods for Research)	3
MATH 2500	Linear Algebra for Applications	3
MATH 3752/5752	Introduction to Probability	3
UNIFI/General Education or University Electives		3
	Hours	**15**
Spring		
MATH 2422	Calculus III	4
STAT 3775/5775	Introduction to Mathematical Statistics	3
UNIFI/General Education or University Electives		3
Visual BASIC recommended		3
	Hours	**13**
Junior		
Fall		
ACT SCI 4735/5735	Actuarial Mathematics	3
FIN 3130	Corporate Finance	3
STAT 3776/5776	Regression Analysis	3
UNIFI/General Education or University Electives		6
	Hours	**15**
Spring		
ACT SCI 4739/5739	Topics in Actuarial Science	3
ACT SCI 4785/5785	Introduction to Financial Engineering	3
FIN 3160	Principles of Investments	3
MKTG 2110	Principles of Marketing	3
UNIFI/General Education or University Electives		4
	Hours	**16**
Senior		
Fall		
ACT SCI 4788/5788	Loss Models	3
FIN 3050	Risk Management and Insurance	3
MGMT 3100	Legal and Social Environment of Business	3
UNIFI/General Education or University Electives		7
	Hours	**16**
Spring		
MATH 4900	Senior Mathematics Seminar	1
MGMT 3153	Organizational Management	3
UNIFI/General Education or University Electives		9
	Hours	**13**
	Total Hours	**120**

* Note: A student who has a grade point average of less that 2.25 in all departmental courses used for this major may not apply a departmental course in which a grade of less than C- is earned.

Learning Outcomes

Mathematics: Statistics/Actuarial Science, B.A.

Goal 1. Problem Solving Specification:

- Understanding: Students will understand or state problems and definitions correctly;
- Modification: Students will modify problems when necessary to make them tractable;
- Reaching a solution: Students will articulate assumptions and reason logically to conclusions;
- Communication and Interpretation: Students will communicate steps and interpret results intelligently when necessary.

Goal 2. Content Specification:

- Knowledge Foundation: Students will demonstrate an understanding of the core knowledge of mathematics.
- Advanced Content: Students will demonstrate comprehension of upper-level content of mathematics, statistics and actuarial science.
- Communication and Interpretation: Students will communicate using correct content terms and interpret concepts when necessary.

Goal 3. Technology/Software:

- Software Proficiency: Students will demonstrate basic proficiency with mathematical and statistical software.
- Analytical Skills: Students will be able to make informed choices about when the use of technology or data analysis is viable and useful.
- Communication and Interpretation: Students will communicate using the right language and interpret results intelligently.

Goal 4. Professional Development:

- Actuarial Science Development: Students with actuarial science emphasis will develop skills and acquire the content knowledge needed to pass actuarial exams offered by the professional

organizations including Society of Actuaries and Casualty Actuarial Society.

Policies

Notes:

1. A student majoring or minoring in mathematics, who has a grade point average of less than 2.25 in all departmental courses used for that major or minor may not apply a departmental course in which a grade of less than C- is earned to her/his major or minor.
2. A student with a major within the Department of Mathematics may declare a second major and/or a certificate within the Department. Interested students should work closely with an advisor.
3. The declaration of both a major and a minor with the Department of Mathematics is limited to the following. Interested students should work closely with an advisor.
    - A student with any Mathematics major may declare the interdisciplinary Data Science Minor.
    - A student with the Mathematics Major or the Mathematics-Teaching Major may declare the Statistics emphasis of the Statistics and Actuarial Science Minor.

Related Programs

- Mathematics - Teaching B.A.
- Mathematics M.A.