

Actuarial Science, MS

Learning Outcomes

Graduates will:

- be able to bring to bear actuarial, financial, mathematical, and statistical techniques to model and analyze risks, particularly in the context of insurance and pension;
- have the knowledge and analytical ability to pass the initial professional actuarial examinations given by the Society of Actuaries and Casualty Actuarial Society, and develop the skills needed for successful self-study of the advanced professional examinations;
- be skillful in leveraging AI tools and computer software to solve actuarial problems;
- be able to clearly communicate results from an actuarial analysis to all stakeholders, and write effective reports that describe the analysis and summarize important findings; and
- possess a basic understanding of insurance and business operations.

Requirements

The Master of Science in actuarial science requires 36 s.h. of graduate credit. Students must maintain a Graduate College program grade-point average of at least 3.00. The program prepares students for actuarial careers by emphasizing the theory that underlies risk processes and the application of this theory to practical problems of insurance pricing and management. It also helps them learn the material that is tested on professional examinations administered by professional organizations such as the Society of Actuaries and the Casualty Actuarial Society.

Students complete required courses and a final examination. All coursework must be taken on an A-F graded basis.

The MS in actuarial science requires the following coursework.

Required Courses

Course #	Title	Hours
All of these:		
ACTS:3080	Mathematics of Finance I	3
ACTS:4130	Quantitative Methods for Actuaries	3
ACTS:4150	Fundamentals of Short-Term Actuarial Mathematics	3
ACTS:4160	Topics in Actuarial Science	arr.
ACTS:4180	Life Contingencies I	3
ACTS:4280	Life Contingencies II	3
ACTS:6200/ DATA:6200/ STAT:6200	Predictive Analytics	3
STAT:4560	Statistics for Risk Modeling I	3
STAT:4561	Statistics for Risk Modeling II	3
STAT:5100	Statistical Inference I	3
STAT:5101	Statistical Inference II	3
STAT:6300	Probability and Stochastic Processes I	3
3 s.h. from these:		
ACTS:6160	Topics in Actuarial Science	arr.

ACTS:7730 Advanced Topics in Actuarial Science/Financial Mathematics arr.

FIN:3300 Corporate Finance 3
Additional course with advisor approval

With advisor approval, students may replace specific required courses as follows.

ACTS:3080 may be replaced by one of the following elective courses: ECON:3100 Intermediate Microeconomics, ECON:3150 Intermediate Macroeconomics, or FIN:3300 Corporate Finance, which satisfy Validation by Educational Experience requirements of the Society of Actuaries.

ACTS:6200 may be replaced by STAT:4750.

Both STAT:4560 and STAT:4561 may be replaced by both STAT:4540 and STAT:6560.

Final Examination

The final examination is offered in the spring semester of the second year of study. Students who do not succeed on their first attempt may retake the exam once.

Graduate Education

Graduate education prepares students with advanced knowledge and skills in specialized fields. At the University of Iowa, the Graduate College advocates for student-centered graduate education and supports equitable application of rules and policies across graduate programs.

Academics

University of Iowa graduate credentials are regulated by policies and requirements found in the Graduate College Manual of Rules and Regulations. This includes minimum grade-point average (GPA) requirements for academic standing and degree conferral. The Graduate College sets the minimum requirement. Individual graduate programs may establish higher GPA requirements.

Admissions

Graduate student applicants must meet admission requirements for both the Graduate College and the program to which they have applied. University of Iowa graduate admission requirements are published by the Graduate College and on the Graduate Admissions website.

Financial Support

Graduate students might be eligible for financial support. Several contingencies apply, including degree program and award type, satisfactory progress toward degree, satisfactory completion of all duties related to an appointment, and availability of funding. Graduate students should inquire directly with their program for more information about funding availability. The Graduate Student Employment Standards govern the employment relationship between the University of Iowa and all graduate teaching and research assistants in all matters except wages, which are covered by an existing collective bargaining agreement or the conditions of an applicable federal grant.

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

Career Advancement

Most actuaries are employed by insurance companies or employee benefits consulting firms. They have responsibilities related to all phases of product development and maintenance for their companies. Individual employers who need guidance in establishing employee insurance and retirement programs also hire actuarial science graduates. A growing number of actuaries work in asset/liability management, some in investment firms, and others in insurance companies.

Actuaries have always been in high demand and earn good salaries. Most University of Iowa graduates find work as actuaries, but some become financial managers and teachers. They take positions in locations all across the country, often in large metropolitan areas.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

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Course	Title	Hours
Academic Career		
Any Semester		
36 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. ^a		
Graduate College program GPA of at least 3.00 is required. ^b		
Hours		0
First Year		
Fall		
ACTS:3080	Mathematics of Finance I	3
ACTS:4130	Quantitative Methods for Actuaries	3
STAT:5100	Statistical Inference I	3
Hours		9
Spring		
ACTS:4150	Fundamentals of Short-Term Actuarial Mathematics	3
ACTS:4180	Life Contingencies I	3
STAT:5101	Statistical Inference II	3
Hours		9
Second Year		
Fall		
ACTS:4280	Life Contingencies II	3
STAT:4560	Statistics for Risk Modeling I	3

STAT:6300	Probability and Stochastic Processes I	3
Hours		9
Spring		
Exam: Master's Final Exam ^{c, d}		
ACTS:6200	Predictive Analytics	3
STAT:4561	Statistics for Risk Modeling II	3
Elective course ^e		3
Hours		9
Total Hours		36

- a Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.
- b Graduate College program GPA is comprised of all courses that are approved degree requirements. If a student takes more than the minimum required number of semester hours to complete the degree, but all courses taken are eligible to count toward the degree, those courses will be included in the Graduate College program GPA.
- c Students must also satisfactorily complete all degree requirements.
- d The final examination is offered in the spring semester of the second year of study. Students who do not succeed on their first attempt may retake the exam once.
- e See the General Catalog for list of approved courses.