Actuarial Science, BS

Learning Outcomes

Students 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 using and developing 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 Bachelor of Science with a major in actuarial science requires a minimum of 120 s.h., including 52 s.h. of work for the major. Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences GE CLAS Core.

The program prepares students for careers as actuaries. It also helps them learn material that is included in professional examinations administered by professional organizations such as the Society of Actuaries and the Casualty Actuarial Society.

Students take a variety of actuarial science courses. They prepare for business aspects of the actuarial profession by studying accounting, law, finance, insurance, and economics. They also complete courses that enhance important communication skills, such as writing and speaking, as part of their GE CLAS Core requirements.

Courses Required for the Major

The BS with a major in actuarial science requires the following coursework. Permission to substitute coursework taken at another institution for required courses at the University of Iowa is decided case by case; students should contact the department.

Course #	Title	Hours
Computer Science		
This course:		
CS:1210	Computer Science I: Fundamentals	4
Mathematics		
All of these:		
MATH:1850	Calculus I	4
MATH:1860	Calculus II	4
MATH:2700	Introduction to Linear Algebra	4
MATH:2850	Calculus III	4
MATH:3770	Foundations of Analysis	4
Statistics and Actuarial Science		
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:4180	Life Contingencies I	3
ACTS:4280	Life Contingencies II	3
STAT:3100/ IGPI:3100	Introduction to Mathematical Statistics I	4
STAT:3101/ IGPI:3101	Introduction to Mathematical Statistics II	3
STAT:4100/ IGPI:4100	Statistical Inference I	3
STAT:4101/ IGPI:4101	Statistical Inference II	3

In exceptional cases, the advisor may grant permission to waive STAT:3100 Introduction to Mathematical Statistics I and/or STAT:3101 Introduction to Mathematical Statistics II.

Students may choose to complete STAT:4560 Statistics for Risk Modeling I and STAT:4561 Statistics for Risk Modeling II (both courses) instead of ACTS:4280 Life Contingencies II, except honors students, who must complete all three courses.

Honors

Honors in the Major

Students majoring in actuarial science have the opportunity to graduate with honors in the major. They must maintain a UI cumulative grade-point average (GPA) of at least 3.33 and a GPA of at least 3.40 in all departmental courses. They also must complete the following five courses in addition to all courses required for the major.

Course #	Title	Hours
ACTS:6200	Predictive Analytics	3
FIN:3300	Corporate Finance	3
MATH:3600	Introduction to Ordinary Differential Equations	3
STAT:4560	Statistics for Risk Modeling I	3
STAT:4561	Statistics for Risk Modeling II	3

University of Iowa Honors Program

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the university's honors program.

Membership in the UI Honors Program is not required to earn honors in the actuarial science major.

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 or 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

Four-Year Graduation Plan

The following checkpoints list the minimum requirements students must complete by certain semesters in order to stay on the university's Four-Year Graduation Plan. Courses in the major are those required to complete the major; they may be offered by departments other than the major department.

Much of the coursework is sequential, so students must begin requirements for the major as soon as possible. Individual study plans must be made carefully. Students who first enroll for a spring semester must consult their advisor to confirm a four-year plan.

Before the third semester begins: MATH:1860 Calculus II and MATH:2700 Introduction to Linear Algebra.

Before the fifth semester begins: MATH:2850 Calculus III, MATH:3770 Foundations of Analysis, STAT:3100 Introduction to Mathematical Statistics I, STAT:3101 Introduction to Mathematical Statistics II, and ACTS:3080 Mathematics of Finance I.

Before the seventh semester begins: STAT:4101 Statistical Inference II, ACTS:4130 Quantitative Methods for Actuaries, ACTS:4150 Fundamentals of Short-Term Actuarial Mathematics, ACTS:4180 Life Contingencies I, and at least 90 s.h. earned toward the degree.

Before the eighth semester begins: ACTS:4280 Life Contingencies II.

During the eighth semester: enrollment in all remaining coursework in the major, all remaining GE CLAS Core courses, and a sufficient number of semester hours to graduate.

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		
Students who major in Actuarial Science BS program will have to perform well to make progress towards the degree. Many courses have minimum grade requirements in prerequisite courses. [a]		
GE CLAS Core: Sustainability [b]		
Hours		**0**

Course	Title	Hours
First Year		
Fall		
CS:1210	Computer Science I: Fundamentals [c]	4
MATH:1850	Calculus I [d]	4
ENGL:1200 or RHET:1030	The Interpretation of Literature or Rhetoric: Writing and Communication	3 - 4
ACTS:1001	Introductory Seminar on Actuarial Science [e]	1
CSI:1600	Success at Iowa	1
Attend the Actuarial Science, Insurance and Risk Management Job Fair during the fall semester to apply for summer internships.		
Hours		**13-14**
Spring		
MATH:1860	Calculus II	4
MATH:2700	Introduction to Linear Algebra	4
ACTS:1001	Introductory Seminar on Actuarial Science [e]	1
RHET:1030 or ENGL:1200	Rhetoric: Writing and Communication or The Interpretation of Literature	3 - 4
GE CLAS Core: Understanding Cultural Perspectives [f]		3
Hours		**15-16**
Second Year		
Fall		
ACTS:3110	Actuarial Exam P Preparation [e]	1
MATH:2850	Calculus III	4
STAT:3100	Introduction to Mathematical Statistics I [g]	4
GE CLAS Core: Natural Sciences without Lab [f]		3
GE CLAS Core: World Languages First Level Proficiency or elective course [h]		4 - 5
Attend the Actuarial Science, Insurance and Risk Management Job Fair during the fall semester to apply for summer internships.		
Hours		**16-17**
Spring		
ACTS:3080	Mathematics of Finance I	3
ACTS:3210	Actuarial Exam FM Preparation [e]	1
MATH:3770	Foundations of Analysis	4
STAT:3101	Introduction to Mathematical Statistics II [i]	3
GE CLAS Core: World Languages Second Level Proficiency or elective course [h]		4 - 5
Hours		**15-16**
Third Year		
Fall		
ACTS:4130	Quantitative Methods for Actuaries [g]	3
STAT:4100	Statistical Inference I [g]	3
GE CLAS Core: Natural Sciences with Lab [f]		4
GE CLAS Core: World Languages Third Level Proficiency or elective course [h]		4 - 5
Elective course [j]		3

	Attend the Actuarial Science, Insurance and Risk Management Job Fair during the fall semester to apply for summer internships.	
	Hours	**17-18**
Spring		
ACTS:4150	Fundamentals of Short-Term Actuarial Mathematics [i]	3
ACTS:4180	Life Contingencies I [i]	3
STAT:4101	Statistical Inference II [i]	3
GE CLAS Core: Literary, Visual, and Performing Arts [f]		3
GE CLAS Core: World Languages Fourth Level Proficiency or elective course [h]		4 - 5
	Hours	**16-17**
Fourth Year		
Fall		
ACTS:4280	Life Contingencies II [g, k]	3
STAT:4560	Statistics for Risk Modeling I [j, l]	3
GE CLAS Core: International and Global Issues [f]		3
GE CLAS Core: Social Sciences [f]		3
Elective course [j]		3
	Attend the Actuarial Science, Insurance and Risk Management Job Fair during the fall semester.	
	Hours	**15**
Spring		
ACTS:6200	Predictive Analytics [j, l]	3
STAT:4561	Statistics for Risk Modeling II [j, l]	3
GE CLAS Core: Values and Society [f]		3
GE CLAS Core: Historical Perspectives [f]		3
Elective course [j]		3
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) [m]		
	Hours	**15**
	Total Hours	**122-128**

a The Academic Advising Center advises Actuarial Science students on prerequisite course planning. Students are advised for success, based on academic strength, not necessarily for a four-year plan. Prerequisites may take more than one and a half years to complete.

b Sustainability must be completed by choosing a course that has been approved for Sustainability AND for one of these General Education areas: Natural Sciences; Quantitative or Formal Reasoning; Social Sciences; Historical Perspectives; International and Global Issues; Literary, Visual, and Performing Arts; or Values and Society.

c Enrollment in this course requires completion of a placement exam.

d Enrollment in math courses requires completion of a placement exam.

e This course is not required for the major but it is strongly encouraged to be taken as an elective.

f GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.

g Typically this course is offered in fall semesters only. Check MyUI for course availability since offerings are subject to change.

h Students who have completed four levels of a single language or two levels of two different languages in high school or college have satisfied the GE CLAS Core World Languages requirement. Students who have completed three levels of a single language may complete a fourth-level course in the same language or may choose an approved World Language and Cultural Exploration course. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course. Contact your academic advisor or CLAS Undergraduate Programs Office with questions concerning the World Languages requirement.

i Typically this course is offered in spring semesters only. Check MyUI for course availability since offerings are subject to change.

j Students may use elective courses to earn credit towards the total s.h. required for graduation or to complete a double major, minors, or certificates.

k Students may choose to complete STAT:4560 and STAT:4561 (both courses) instead of ACTS:4280, except honors students, who must complete all three courses.

l This course is a recommended elective, not a requirement. Students may choose another elective. Prerequisites may apply.

m Please see Academic Calendar, on Office of the Registrar website, for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor or Degree Services.