

Urban Studies

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Actuarial Science (ACSC)

Youn (MATH), director, Herman (MATH)

The Bachelor of Science in Actuarial Science is an interdisciplinary degree program offered through the Department of Mathematics. (See also the Department of Mathematics in this catalog.)

Actuarial science education equips students with strong mathematical problem-solving skills that can be applied to business careers. The major requirements consist of courses in mathematics, actuarial science, computer science, business, economics and a course in communication. Coupled with a firm foundation in the liberal arts, this major provides a sound grounding in analytical problem-solving and communication skills.

This program prepares students for a variety of careers with insurance companies, consulting firms, financial institutions, industrial corporations or government agencies. It also provides a good preparation for non-actuarial careers in banking, finance or insurance. In addition, the statistical background developed by an actuarial student is valuable in a variety of other fields.

Students graduating with a major in Actuarial Science will become proficient in basic mathematics through multi-variate calculus and probability together with basic notions of insurance and risk management. They will demonstrate the ability to think clearly and critically in solving problems related to the analysis and management of risk. They will be able to effectively communicate technical and non-technical information to their peers and to non-specialists in their work environment.

To be certified as a Fellow or an Associate by either the Society of Actuaries or the Casualty Actuarial Society, one must pass a series of rigorous examinations. The earlier examinations are focused on mathematics and statistics and can be taken while a student. The later examinations cover aspects of business, economics, and the regulatory climate.

A careful selection of courses from a variety of departments helps a student to prepare for many excellent professional opportunities in this field. Students should see the director of the Actuarial Program for advice in selecting courses for a particular purpose.

Within the Department of Mathematics, the Center for Applied Mathematics provides opportunities for actuarial science students to work on significant mathematical problems of current interest to business, industry, and government.

Major in Actuarial Science (B.S.)

- ACCT 205 Introduction to Accounting
 - ACSC 264 Theory of Interest
 - ACSC 351 Foundations of Actuarial Mathematics
 - ACSC 352 Actuarial Contingencies
 - BUS 201 Ethics and Practice: Foundations of Business
 - ECON 252 Principles of Microeconomics
 - FINC 321 Financial Management
 - MATH 113 Calculus I
 - MATH 114 Calculus II
 - MATH 200 Multi-Variable Calculus
 - MATH 210 Linear Algebra and Differential Equations
 - MATH 313 Probability
 - MATH 314 Mathematical Statistics
 - QMCS 230 Software Design Using the JAVA Language
- A course in risk management and insurance approved by the program director

Plus one of:

- MATH 333 Applied Statistical Methods: Regression, Time Series, Forecasting
- MATH 385 Mathematical Methods of Numerical Analysis

Interdisciplinary Programs

Plus one of:

COMM 103	Public Speaking
COMM 104	Communication in the Workplace
ENGL	200 or above
JOUR 215	Journalistic Writing in the Workplace
JOUR 311	Persuasion in Writing

Suggested Electives:

BLAW 365	Business Law
ECON 251	Principles of Macroeconomics
ECON 351	Macroeconomic Theory
ECON 352	Microeconomic Theory
ECON 355	Game Theory
FINC 324	Advanced Financial Management
FINC	400-level Investment Courses
MBIS 701	Insurance Seminar
MKTG 300	Principles of Marketing
QMCS 280	Object-Oriented Design and Programming
QMCS 450	Database Design

264 Theory of Interest (MATH 264)

A survey of topics in the mathematical analysis of financial transactions which involve payments made over time. Specific areas of concentration will include the time value of money; the analysis of annuities; amortization and sinking funds; and the pricing and rates of return on investments. Both continuous time and discrete time problems will be considered.

Prerequisite: MATH 114.

351 Foundations of Actuarial Mathematics

The course covers the theory and applications of contingency mathematics in the area of life and health insurance, annuities and pensions from both the probabilistic and deterministic approaches. Topics will include: survival distributions, actuarial notation, life insurance and life annuities, net premiums and reserves.

Prerequisite: 264 and MATH 313.

352 Actuarial Contingencies

Extension of the analysis of 351 to multiple life functions and multiple decrement theory. Topics will include: multiple life functions and multiple decrement models, valuation of pensions, insurance models including expenses, nonforfeiture benefits and dividends.

Prerequisite: 351

Biochemistry

DeJong (BIOL), Hartshorn (CHEM), chairs; Advisory committee: Chaplin (BIOL), Glorvigen (CHEM), Olson (CHEM), Verhoeven (BIOL)

Biochemistry is an interdisciplinary major that draws upon faculty and courses in the departments of Biology and Chemistry. The major is administered by a committee of representatives from both departments and is designed to meet the needs of students interested in gaining an understanding of the chemistry of life processes. Students who fulfill the requirements will receive a Bachelor of Science (B.S.) degree in Biochemistry. The program is appropriate for students pursuing graduate studies in biochemistry, medicine, or related fields. The major is also suitable for students interested in positions in biotechnology after graduation.

Entering students interested in this major should inform Academic Counseling. Students are advised to begin their introductory biology and chemistry coursework in their freshman year. The biochemistry committee will coordinate advising, though any faculty member of either department may serve as an adviser. Students should talk with an adviser as soon as possible following their freshman year in order to select the elective courses that will be most appropriate to their interests. A research course in either biology or chemistry can be counted as one of the electives and is highly encouraged if the student will be seeking admission to a graduate program in biochemistry or molecular biology.

Students choosing this major may not take a second major or a minor in either Biology or Chemistry.

Major in Biochemistry (B.S.)

BIOL 201	Diversity and Adaptation
BIOL 202	Genetics and Population Biology
BIOL 204	Cellular and Molecular Biology
CHEM 111	General Chemistry I