# ACTUARIAL SCIENCE (ACT SCI)

### ACT SCI 300 — ACTUARIAL SCIENCE METHODS I
1 credit.

Develop a knowledge of fundamental mathematical tools for quantitatively assessing risk. Emphasize the applications of these tools to problems encountered in actuarial science.
**Requisites:** (STAT/MATH 309, STAT 311, or STAT/MATH 431), declared in Capstone Certificate in Actuarial Science, or declared in undergraduate Business Exchange program. Not open to graduate students.
**Repeatable for Credit:** Yes, for 2 number of completions
**Last Taught:** Spring 2024

### ACT SCI 301 — ACTUARIAL SCIENCE METHODS II
1 credit.

Develop a knowledge of mathematical tools for quantitatively assessing financial risk. Emphasize the applications to problems encountered in actuarial science.
**Requisites:** (ACT SCI 303 or concurrent enrollment), declared in Capstone Certificate in Actuarial Science, or declared in undergraduate Business Exchange program. Not open to graduate students.
**Repeatable for Credit:** Yes, for 2 number of completions
**Last Taught:** Spring 2024

### ACT SCI 303 — THEORY OF INTEREST
3 credits.

Time value of money; interest compounded discretely and continuously; accumulated and present value of payments; loans and sinking funds; annuity and bond valuation; interest rate term structure; duration, immunization and interest rate swaps.
**Requisites:** MATH 222, 276, or declared in the Business Exchange program
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

### ACT SCI 365 — CONTEMPORARY TOPICS
1-3 credits.

Exploration of subject areas possibly to be introduced into the business curriculum.
**Requisites:** None
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Fall 2023

### ACT SCI 399 — READING AND RESEARCH-ACTUARIAL SCIENCE
1-3 credits.

Directed study in various areas of actuarial science that provides the opportunity to participate in more in-depth study (intermediate level) under the direct guidance of actuarial science faculty.
**Requisites:** Consent of instructor
**Course Designation:** Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** Yes, for 4 number of completions
**Last Taught:** Spring 2024

### ACT SCI 650 — ACTUARIAL MATHEMATICS I
3 credits.

Advanced problems in the mathematical theory of life contingencies; force of mortality, laws of mortality; premiums and reserves for insurance and annuities based on a single life.
**Requisites:** ACT SCI 303 and (STAT/MATH 309, STAT 311, or STAT/MATH 431), or declared in undergraduate Business Exchange program
**Course Designation:** Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

### ACT SCI 651 — ACTUARIAL MATHEMATICS II
3 credits.

Continuation of ACT SCI 650. Joint life probabilities, annuities and insurances; multiple-decrement theory; pension fund mathematics.
**Requisites:** ACT SCI 650
**Course Designation:** Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

### ACT SCI 652 — LOSS MODELS I
3 credits.

Definition and selection of probability distributions appropriate for insurance data that are heavily tailed and skewed.
**Requisites:** (STAT/MATH 310 or STAT 312 or concurrent enrollment) or declared in undergraduate Business Exchange program
**Course Designation:** Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

### ACT SCI 653 — LOSS MODELS II
3 credits.

Estimation of parameters of probability distributions appropriate for insurance data that are heavy tailed and skewed; assessment of credibility of data for ratemaking.
**Requisites:** ACT SCI 652 or declared in undergraduate Business Exchange program
**Course Designation:** Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

### ACT SCI 654 — REGRESSION AND TIME SERIES FOR ACTUARIES
2-3 credits.

Linear regression and correlation; generalized linear regression models; introduction to time series; time series model building and forecasting with focus on data of interest to actuaries.
**Requisites:** Junior standing and (GEN BUS 306, 704, STAT/MATH 310, or STAT 312), or declared in the Business Exchange program
**Course Designation:** Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

**ACT SCI 655 — HEALTH ANALYTICS**
2-3 credits.

Provides an introduction to the broad area of health, integrating how researchers from multiple perspectives have investigated various aspects of health, along with the hands-on practice of learning and using statistical tools to analyze these topics.
**Requisites:** Junior standing and (GEN BUS 306, 704, STAT/MATH  310, or STAT 312), or declared in the Business Exchange program
**Repeatable for Credit:** No
**Last Taught:** Fall 2023

**ACT SCI 657 — RISK ANALYTICS**
2-3 credits.

Develops a toolbox for modeling, communicating, and managing risk and uncertainty in predictive models. Topics include time-series forecasting, probabilistic forecasting techniques, scenario analysis, and integrations of modern machine learning methods with distribution-based predictive models, among others. Particularly addresses situations where data is sparse, including climate, cyber, and catastrophic risk.
**Requisites:** ACT SCI 654, 655, or GEN BUS 656
**Repeatable for Credit:** No
**Last Taught:** Spring 2024

**ACT SCI 765 — CONTEMPORARY TOPICS**
1-3 credits.

Exploration of subject areas possibly to be introduced into the business curriculum.
**Requisites:** Graduate/professional standing or declared in graduate Business Exchange program
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Spring 2020