

# 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 2023

## 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 2023

## 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 2023

## 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:** Spring 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:** Fall 2022

## 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 2023

## 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 2023

## 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 2023

## 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 2023

## 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:** Fall 2022

### **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:** Spring 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 2023

### **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