

ACTUARIAL SCIENCE (ASC)

ASC 150 First Year Seminar (3 credits)

This first year seminar course provides an introduction to the mathematical and financial techniques actuaries use to forecast the future and quantify risk. Topics may be selected from basic probability, introduction to financial mathematics, time series analysis and statistical correlation, credibility theory, pricing insurance products and risk load, portfolio theory and asset allocation management. Students are also required to make a presentation on a topic related to actuarial science. The course is taught in a computer classroom and students make extensive use of software such as Microsoft Excel in the development of mathematical models.

Attributes: First-Year Seminar, Undergraduate

ASC 170 Topics in Actuarial Science (3 credits)

Topics will vary according to the semester in which the class is offered.

Attributes: Undergraduate

ASC 201 Financial Methods in Act Sci (3 credits)

This course provides an introduction to financial theory and practice as it relates to the management and valuation of publicly-traded companies, and the role of interest rates in capital markets and the economy. Topics include: the corporation and financial markets, financial statement analysis, financial decision making, the time value of money, interest rates, bond valuation and debt financing, fundamentals of investment decisions and capital budgeting, stock valuation, raising equity capital, capital markets and the pricing of risk, optimal portfolios, the Capital Asset Pricing Model, and the cost of capital. ASC 201 is designed to (i) fulfill the Validation by Educational Experience (VEE) requirements of the Society of Actuaries (SOA) and the Casualty Actuarial Society (CAS) pertaining to Corporate Finance, and (ii) introduce actuarial science majors to the basic concepts necessary to succeed in ASC 401 (Financial Mathematics) and the SOA Exam FM / CAS Exam 2 sponsored by the actuarial societies. Where appropriate, examples and problems from prior FM/2 exams will be assigned and completed.

Prerequisites: ECN 101 and ACC 101 and MAT 161

Attributes: Undergraduate

ASC 270 Topics in Actuarial Science (3 credits)

Topics will vary according to the semester in which the class is offered.

Attributes: Undergraduate

ASC 300 Intro to Actuarial Probability (3 credits)

This course is the first part of a two-semester sequence that will prepare the student to take Exam P of the Society of Actuaries. This course includes counting principles, permutations, combinations, basic probability concepts, sample spaces and events, conditional probabilities, Bayes's Theorem, mutually-exclusive and independent events, discrete and continuous univariate random variable distributions (including binomial, negative binomial, geometric, hypergeometric, Poisson, uniform, exponential, gamma, normal, lognormal, and beta) and their applications.

Prerequisites: MAT 162

Attributes: Undergraduate

ASC 301 Actuarial Probability (3 credits)

This course provides an introduction to the basic probabilistic principles of insurance and Risk Management. Selected topics are covered to enable the application of probability theory to solve problems found in insurance and risk management applications. A problem solving approach will be adopted to provide preparation to pass the first actuarial exam co-sponsored by the Casualty Actuarial Society (Part 1) and the Society of Actuaries (Part P).

Prerequisites: MAT 321 or ASC 300

Attributes: Undergraduate

ASC 370 Topics in Actuarial Science (3 credits)

These courses are designed to give in-depth coverage of Actuarial Science topics that are not covered in great detail in other courses.

Attributes: Undergraduate

ASC 401 Financial Math - Actuarial Sci (3 credits)

This course provides an in depth study of the theory of interest. Topics that will be covered include: calculation of the effective rates of interest and discount, evaluation of accumulated and present values of fixed and variable annuities, solution of interest problems involving unknown time periods and rates, determination of yield rates, amortization of loans and sinking funds, calculation of the price of a bond, and valuation of securities. This course will prepare students for the actuarial science examination in financial mathematics which is co-sponsored by the Casualty Actuarial Society (Part 2) and the Society of Actuaries (Part FM).

Prerequisites: MAT 162

Attributes: Undergraduate

ASC 402 Investment Mathematics (3 credits)

This course introduces the basics of investment and financial pricing based on rigorous mathematical reasoning. It consists of two parts. In the first part, students will learn how to construct a portfolio based on the mean-variance principle, the capital asset pricing model, multi-factor model and behavioral finance. The second part is on financial derivatives: a put-call parity, the binomial model for pricing European and American contingent claims, Black-Scholes framework, delta-hedging, and exotic options. This course will prepare students for the actuarial science exam in Investment and Financial Markets (IFM) of the Society of Actuaries or Exam 3F of the Casualty Actuarial Society. If time permits, the class will discuss the fundamental difference between Actuarial Pricing and Financial Pricing and how to combine them to price hybrid products such as Variable Annuities.

Prerequisites: MAT 322 and ASC 401

Attributes: Undergraduate

ASC 410 Modern Actuarial Statistics (3 credits)

This course covers selected topics from Exam MAS-I of the Casualty Actuarial Society. This course covers Poisson processes (including expected values, variances, probabilities and applications), discrete Markov Chains, Life Contingency problems, Monte Carlo Simulation, random number generation, maximum likelihood estimation, testing statistical hypotheses, insurance claim applications of various statistical distributions.

Prerequisites: ASC 301

Attributes: Undergraduate

ASC 420 Fundamentals of Actuarial Math (3 credits)

This course covers selected topics from Exam FAM of the Society of Actuaries. This course covers key features of insurance and reinsurance coverage, characteristics and applications of commonly used severity, frequency, and aggregate models, estimating parameters for severity and frequency distributions using MLE, credibility concepts and their applications, pricing and reserving for short-term insurance coverages, long-term insurance coverages and retirement financial security programs, parametric and non-parametric mortality and survival models, present value random variables associated with long-term insurance coverages, premium and policy value calculation for long-term insurance coverages.

Prerequisites: ASC 301

Attributes: Undergraduate

ASC 470 Topics in Actuarial Science (3 credits)

Topics will vary according to the semester in which the class is offered.

ASC 471 Independent Study (3 credits)

Students will study a topic in actuarial science with a faculty mentor.

Attributes: Undergraduate

ASC 472 Independent Study (3 credits)

Students will study a topic in actuarial science with a faculty mentor.

Attributes: Undergraduate

ASC 493 Honors Capstone: Actuarial Sci (3 credits)

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