ACTUARIAL SCIENCE (ACTS)

ACTS 95 Actuarial Practicum
Notes: Open only to Actuarial Science majors.
Description: Course tracks completion of internship or professional development requirement for undergraduate Actuarial Science majors and graduate students in the Actuarial Science masters program.
Credit Hours: 0
Max credits per semester:
Max credits per degree:
Grading Option: Pass No Pass

ACTS 250 Actuarial Technical Skills
Prerequisites: BSAD 50
Description: Data organization, manipulation, and analysis using current software tools and programming languages to solve business problems of an actuarial nature.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR
Prerequisite for: FINA 361; FINA 361A; SCMA 331; SCMA 335; SCMA 350

ACTS 395 Professional Internship
Crosslisted with: BSAD 395, ACCT 395, ECON 395, FINA 395, MNGT 395, SCMA 395
Prerequisites: An undergraduate major in the College of Business with at least sophomore standing and departmental consent and acceptance into an approved internship. Departmental credit for course cross-listings may have additional requirements for consent.
Notes: May be repeated.
Description: Provides an opportunity to study theories, principles, practices, techniques, and strategies utilized in the business field through an internship related to the major field of study and an integral or important part of their program of study. Reflect on classroom knowledge and develop practical experience in professional business situations through an approved internship.
Credit Hours: 0-3
Min credits per semester:
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Graded with Option
Experiential Learning: Internship/Co-op

ACTS 396 Independent Study
Prerequisites: Permission.
Description: Faculty supervised independent study.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Graded with Option

ACTS 410 Credibility Theory and Loss Distributions
Crosslisted with: ACTS 810
Prerequisites: STAT 463 with a grade of "C" or better.
Description: Introduction to a variety of loss distributions used for prediction of losses in short-term insurance, different approaches to model selection, and Bayesian and empirical Bayesian credibility theory.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ACTS 430 Actuarial Applications of Applied Statistics
Crosslisted with: ACTS 830
Prerequisites: STAT 463 with a grade of "C" or better
Notes: Data sets processed and analyzed using statistical software.
Description: Introduction to forecasting in actuarial science. Simple and multiple regression, instrumental variables, time series methods, and applications of methods in forecasting actuarial variables. Interest rates, inflation rates, and claim frequencies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

ACTS 431 Actuarial Applications of Time Series and Machine Learning
Crosslisted with: ACTS 831
Prerequisites: STAT 463 with a grade of "C" or better.
Description: Introduction to statistical learning with actuarial applications using time series models and machine learning techniques. The topics covered include time series models, principal component analysis (PCA), decision tree, and clustering.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ACTS 440 Interest Theory
Crosslisted with: ACTS 840
Prerequisites: MATH 208 or 208H, or parallel
Notes: Grade only
Description: Fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows. Practical applications of these concepts in loans, bonds, capital budgeting, and portfolio management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Prerequisite for: AECN 416; ECON 365, FINA 365; FINA 338; FINA 363; FINA 367; FINA 375; FINA 382; FINA 405; FINA 450; FINA 461; FINA 464; MNGT 475; MNGT 475H, RAIK 476H

ACTS 445 Introduction to Actuarial Models
Prerequisites: MATH 208 or 208H with a grade of "Pass" or "C" or better.
Description: Basic probability theory, random variables for actuarial models, bask distributional quantiles, characteristics of actuarial models, commonly used discrete and continuous distributions for actuarial models, and survival models.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ACTS 450 Stochastic Processes for Actuaries
Crosslisted with: ACTS 850
Prerequisites: STAT 463 with a grade of "C" or better
Description: Introduction to stochastic processes and their applications in actuarial science. Discrete-time and continuous-time processes; Markov chains; the Poisson process; compound Poisson processes; non-homogeneous Poisson processes; arithmetic and geometric Brownian motions. Applications of these processes in computation of resident fees for continuing care retirement communities. Pricing of financial instruments.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded

ACTS 460 Short-Term Actuarial Mathematics
Crosslisted with: ACTS 860
Prerequisites: ACTS 445 and STAT 462, each with a grade of "C" or better.
Description: Introduction to short-term insurance coverage, risk measure, coverage modifications, aggregate loss models, introduction to credibility, short-term insurance loss reserving, and short-term insurance ratemaking.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING
Prerequisite for: ACTS 473, ACTS 873

ACTS 470 Long-Term Actuarial Mathematics
Crosslisted with: ACTS 870
Prerequisites: ACTS 445 and STAT 462, each with a grade of "C" or better
Notes: First course of a two-course sequence that includes ACTS 471.
Description: Theory and applications of contingency mathematics in the areas of life and health insurance, annuities, and pensions. Probabilistic models.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING
Prerequisite for: ACTS 471, ACTS 871; ACTS 472, ACTS 872

ACTS 471 Advanced Long-Term Actuarial Mathematics I
Crosslisted with: ACTS 871
Prerequisites: ACTS 470 and STAT 462, each with a grade of "C" or better; graduate students must complete ACTS 870 with a grade of "B" or better.
Notes: Second course of a two-course sequence that includes ACTS 470.
Description: Further applications of actuarial probabilistic methods to determine net premiums, gross premiums, and reserves in the areas of life and health insurance, and annuities. Other topics include insurance and annuities involving multiple lives, multiple decrements, multi-state models, and pensions.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

ACTS 472 Advanced Long-Term Actuarial Mathematics II
Crosslisted with: ACTS 872
Prerequisites: ACTS 470 and STAT 462, each with a grade of "C" or better; graduate students must complete ACTS 870 with a grade of "B" or better.
Description: Further applications of actuarial probabilistic methods to determine in the areas of interpreting and performing calculations involving profit testing on both traditional life insurance and more modern life insurance such as universal life and equity-linked insurance, as well as pricing and reserving embedded options.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

ACTS 473 Introduction to Advanced Short-Term Risk Models
Crosslisted with: ACTS 873
Prerequisites: ACTS 460 and STAT 462, each with a grade of "C" or better; graduate students must completed ACTS 860 with a grade of "B" or better.
Description: The theory and applications of short-term actuarial models are explored. Topics include Interpreting and performing calculations involving: (i) some commonly used claim frequency and claim severity distributions as they are applied in so-called aggregate risk models; (ii) coverage modifications; (iii) actuarial ratemaking; and (iv) various loss-reserving techniques for property/casualty insurance policies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

ACTS 475 Actuarial Applications in Practice
Crosslisted with: ACTS 875
Prerequisites: ACTS 470/870; FINA 338
Description: Principles and practices of pricing and/or funding and valuation for life, health, property and liability insurance, and annuities and pension plans. Commercially available actuarial modeling software.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR
ACE: ACE 10 Integrated Product