Actuarial Science

**ACTS 6301** Principles of Actuarial Models: Long Term Actuarial Mathematics I (3 semester credit hours) The purpose of this class is to develop the students' knowledge of the theoretical basis of life contingent actuarial models and the application of those models to life insurance and other financial risks. Life contingencies, survival models, life insurances, life annuities, and their corresponding premiums will be studied. Reserves for life insurance and life annuities will be introduced. This class covers parts of SOA Exam LTAM. Prerequisites: *(STAT 5351 and ACTS 6308)* or instructor consent required. (3-0) T

**ACTS 6302** Investment and Financial Markets (3 semester credit hours) This course aims to develop students' knowledge of the theoretical basis of Corporate Finance and Financial Models, and their applications to insurance and other financial risks. The material exhibited includes introductory derivatives - forward contracts and futures, no-arbitrage pricing of financial derivatives, general properties of options, binomial asset pricing model, Black-Scholes option pricing model, analysis of option Greeks, mean-variance portfolio theory, asset pricing models, market efficiency and behavioral finance, and investment risk and project analysis. This class covers parts of CAS exam 3F and SOA exam IFM. Prerequisite: *(STAT 5351)* or instructor consent required. (3-0) T

**ACTS 6303** Principles of Actuarial Models: Long Term Actuarial Mathematics II (3 semester credit hours) The purpose of this class is to further develop the students' knowledge of the theoretical basis of life contingent actuarial models and the application of those models to insurance and other financial risks. Reserves for life insurances and life annuities, multiple-life models, multiple-decrement models, multi-state models, long-term insurance coverages, pension plans and retirement benefits, Markov chains, profit tests, and estimation of mortality rates will be studied. This class covers parts of SOA Exam LTAM. Prerequisite: *(ACTS 6301)* or instructor consent required. (3-0) T

**ACTS 6304** Principles of Actuarial Models: Short Term Actuarial Mathematics I (3 semester credit hours) The purpose of this class is to develop the students' knowledge of the severity, frequency and aggregate risk models and the application of those models to property and casualty insurance and other financial risks. Coverage modifications, risk measures and construction and selection of parametric models using the maximum likelihood estimator (MLE) technique will be discussed. This class covers parts of the SOA Exam STAM. Prerequisite: *(STAT 5352)* or instructor consent required. (3-0) T

**ACTS 6305** Principles of Actuarial Models: Short Term Actuarial Mathematics II (3 semester credit hours) The purpose of this class is to further develop the students' knowledge of construction and selection of parametric models using the Maximum Likelihood Estimator (MLE) method, using the Bayesian estimation technique as well as model selection using hypothesis testing and score-based approaches. In addition, Loss estimation using credibility theory, insurance and reinsurance coverages, as well as rate making and loss reserving of property and casualty insurance will be discussed. This class covers parts of the SOA Exam STAM. Prerequisites: *(STAT 5352 and ACTS 6304)* or instructor consent required. (3-0) T

**ACTS 6306** Advanced Actuarial Applications (3 semester credit hours) This class covers Credibility Theory parts of the SOA Exam STAM (Short Term Actuarial Mathematics) and CAS Exam 5 (Basic Techniques for Ratemaking and Estimating Claim Liabilities) with emphasis on Bayesian and Bhilman credibility. Instructor consent required. (3-0) R
**ACTS 6308** Actuarial Financial Mathematics (3 semester credit hours) The purpose of this course is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, asset liability management, investment income, capital budgeting, and valuing contingent cash flows. The topics discussed include loans, bonds, and annuities, as well as determinants of interest rates and interest rates swaps. This class covers parts of the CAS Exam 2 and the SOA Exam FM. Instructor consent required. (3-0) Y