Actuarial Science

**ACTS 4301** Long Term Actuarial Mathematics I (3 semester credit hours) The purpose of this class is to develop the student's knowledge of the theoretical basis of life contingent actuarial models and the application of those models to insurance and other financial risks. Life contingencies, survival models, life insurances, annuities, and premiums will be studied. This class covers parts of SOA Exam LTAM. Prerequisites: **STAT 4351** with a grade C- or higher and **ACTS 4308** with a grade C- or higher. (3-0) T

**ACTS 4302** Investment and Financial Markets I (3 semester credit hours) This 3 semester credit hour course develops the student's knowledge of the theoretical basis of certain actuarial models and the application of those models to insurance and other financial risks. The topics discussed include mean-variance portfolio theory, asset pricing models, market efficiency and behavioral finance, investment risk and project analysis, capital structure, forwards and futures, and introduction to options. This class covers parts of CAS exam 3F and SOA exam IFM. Prerequisites: **STAT 4351** with a grade C- or higher and **ACTS 4308** with a grade C- or higher. (3-0) T

**ACTS 4303** Long Term Actuarial Mathematics II (3 semester credit hours) The purpose of this class is to further develop the student's knowledge of the theoretical basis of life contingent actuarial models and the application of those models to insurance and other financial risks. Reserves for insurances and annuities, multi-state models, long-term insurance coverages, pension plans and retirement benefits will be studied. This class covers parts of SOA Exam LTAM. Prerequisites: **ACTS 4301** with a grade C- or higher and instructor consent required. (3-0) Y

**ACTS 4304** Short Term Actuarial Mathematics I (3 semester credit hours) The purpose of this class is to develop the student's knowledge of the severity, frequency, and aggregate risk models and the application of those models to insurance and other financial risks. Coverage modifications, risk measures and construction, and selection of parametric models using the maximum likelihood estimator technique will be discussed. This class covers parts of the SOA Exam STAM. Prerequisite: **STAT 4352** with the grade C- or higher. (3-0) T

**ACTS 4305** Short Term Actuarial Mathematics II (3 semester credit hours) The purpose of this class is to further develop the student's knowledge of construction and selection of parametric models using Bayesian estimation technique as well as model selection using hypothesis testing and score-based approaches. Loss estimation using credibility theory, insurance and reinsurance coverages, and pricing and reserving will be discussed. This class covers parts of the CAS Exam 5 and the SOA Exam STAM. May be repeated for credit (6 semester credit hours maximum). Prerequisites: **ACTS 4304** with a grade C- or higher and instructor consent required. (3-0) Y

**ACTS 4306** Actuarial Probability as Problem Solving (3 semester credit hours) Topics in actuarial probability via solving problems. This class covers topics of Exam 1/P. Prerequisite: **STAT 4351** or instructor consent required. (3-0) R

**ACTS 4307** Statistics for Risk Modeling (3 semester credit hours) The purpose of this class is to provide an understanding of the basics of several important analytic methods such as linear models, time series models, principal components and cluster analysis, and decision trees. This class covers parts of the SOA Exam SRM and leads the student to the deeper preparation for the SOA Exam PA - Predictive Analytics. May
be repeated for credit (6 semester credit hours maximum). Prerequisites: STAT 3355 and STAT 4352. (3-0) Y

**ACTS 4308** Actuarial Financial Mathematics (3 semester credit hours) The purpose of this 3 semester credit hour 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. Prerequisite: MATH 2415 with a grade of C- or higher or MATH 2419 with a grade of C- or higher. (3-0) R

**ACTS 4309** Investment and Financial Markets II (3 semester credit hours) This course develops the student's knowledge of the theory of options. The topics discussed include general properties of options, binomial pricing models, Black-Scholes option pricing model, option Greeks, and risk management. This class covers parts of CAS exam 3F and SOA exam IFM. Prerequisite: ACTS 4302 with grade C- or higher. (3-0) Y