ACTUARIAL SCIENCE (ACSC)

ACSC 101 - ACTUARIAL CAREER
Introduce students to the diverse field that encompasses actuarial science. The focus will be on exploring the many paths that actuaries can embark upon (life, pension, health, consulting, property & casualty, and other alternatives). The course will also incorporate the development of certain soft skills such as public speaking, presentations, debate, where appropriate.
Credits: 1
Course Notes: For students interested in Actuarial Science and related fields.

ACSC 246 - LINEAR ALGEBRA
Vector spaces; linear transformations and matrices; inner products and orthogonality; eigenvalues; eigenvectors; and diagonalization.
Credits: 3
Prerequisites: MATH 231 or MATH 245 or MATH 290

ACSC 309 - DATA MINING
Methods of knowledge discovery in massive data, i.e. the study of computer-assisted process of digging through and analyzing enormous data sets and then extracting the 'meaning' of the data by applying mathematical methods. The methods that we study in this course are designed to predict behaviors and future trends based on existing data. Topics include classifications techniques, clusterization techniques, association rule discovery techniques, techniques for improving data quality.
Credits: 3
Prerequisites: (MATH 217 or MATH 347) and MATH 246 and CST 150

ACSC 323 - COOPERATION AND COMPETITION -- GAME THEORY AND APPLICATIONS
Study of the ways in which strategic interactions among autonomous agents produce outcomes with respect to the preferences (or utilities) of those agents. This course covers game-theoretic foundations of cooperative and non-cooperative behavior of independent agents.
The course emphasizes applications drawn from artificial intelligence, decision theory, economics, psychology, business management and finance. See Cst 310.
Credits: 3
Prerequisites: (MATH 246 or ACSC 246) and (MATH 217 or ECON 234 or SOC 291 or MATH 238 or MATH 245 or MATH 290 or MATH 347 or ACSC 347)

ACSC 328 - LINEAR PROGRAMMING & OPTIMIZATION
Models of optimization with linear constraints and objectives; simplex method and related algorithms; duality and sensitivity; transportation and assignment problems, games, and network flows. See Cst 328.
Credits: 3
Prerequisites: MATH 246 or ACSC 246

ACSC 347 - PROBABILITY THEORY
Probability models; random variables; probability distributions; expectation and moment generating functions of random variables; multivariate distributions. See MATH 347.
Credits: 3
Prerequisites: MATH 233 (may be taken concurrently)
Course Notes: or concurrent.

ACSC 348 - MATHEMATICAL STATISTICS
Distributions of functions of random variables, sampling distributions; Central Limit Theorem; point estimators and confidence intervals; hypothesis testing; linear models. See MATH 348.
Credits: 3
Prerequisites: ACSC 347 or MATH 347

ACSC 349 - REGRESSION & TIME SERIES
Simple and multiple linear regression models; time series analysis; applications to forecasting; statistical software. See MATH 349.
Credits: 3
Prerequisites: (MATH 231 and (MATH 217 or ECON 234 or SOC 291)) or ACSC 348 or MATH 348

ACSC 366 - ADVANCED EXCEL METHODS
An advanced computer use course emphasizing the advanced use of Microsoft Excel to structure and solve real-world problems which can arise in any discipline. Students will learn to model problems, apply logic to their models, import and groom data from a variety of sources, organize and evaluate data using pivot tables and charts, performing what-if analysis using scenarios, create solver models for more complex problems, and automate tasks in Excel using Macros & VBA for Excel.
Credits: 3
Prerequisites: CST 150
Course Notes: Cross-Listed with CST 366

ACSC 367 - FINANCIAL MATH
Mathematics of interest, accumulated value, and present value; annuities certain; amortization schedules and sinking funds; bonds and related securities; depreciation; rates of return; spot and forward rates of interest; cashflow duration and immunization; stocks, mutual funds, fixed income. Financial calculator. See MATH 367.
Credits: 3
Prerequisites: MATH 232

ACSC 369 - MODELS FOR LIFE CONTINGENCIES
Survival distributions and life tables; life insurance; life annuities; benefit premium; premium calculation.
Credits: 3
Prerequisites: (ACSC 347 or MATH 347) and (ACSC 367 or MATH 367 (may be taken concurrently))
Course Notes: or concurrently

ACSC 378 - TOPICS IN ACTUARIAL MATH
Selected topics in actuarial models and actuarial modeling. May be repeated for up to six semester hours credit.
Credits: 1,3
Course Notes: Consent of Instructor

ACSC 380FM - ACTUARIAL SCIENCE SEMINAR:EXAM FM/2
Preparation for the Society of Actuaries Exam FM and the Casualty Actuarial Society Exam 2.
Credits: 3
Prerequisites: ACSC 367 or MATH 367
Course Notes: Preparation for Exam FM.

ACSC 380P - ACTUARIAL SCIENCE SEMINAR: EXAM P/1
Preparation for the Society of Actuaries Exam P and the Casualty Actuarial Society Exam 1.
Credits: 3
Prerequisites: ACSC 348 (may be taken concurrently) or MATH 348 (may be taken concurrently)
Course Notes: Preparation for Exam P. ACSC 347 with a min grade of C- or concurrent or MATH 347 with a min grade of C-

ACSC 390 - INDUSTRIAL RESEARCH PROBLEMS
Students work on a semester long research project solving a real world
problem from industry using various methods of mathematical modeling.
Problems vary by semester.
Credits: 3
Prerequisites: MATH 232
Course Notes: Capstone

ACSC 395 - INDEPENDENT STUDY
Credits: 1-6