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. See Cst 309.
Credits: 3
Prerequisites: (MATH 246 or ACSC 246 or MATH 300 or ACSC 300)

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: ACSC 300 or MATH 300 or ACSC 246 or MATH 246 and (MATH 245 or MATH 290 or MATH 217 or MATH 238 or ECON 234 or SOC 291 or ACSC 347 or MATH 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 or ACSC 300

ACSC 347 - PROBABILITY THEORY
Probability models; random variables; probability distributions; expectation and moment generating functions of random variables; multivariate distributions.
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.
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.
Credits: 3
Prerequisites: (MATH 231 and (MATH 217 or ECON 234)) or ACSC 348 or MATH 348

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.
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 395 - INDEPENDENT STUDY
Credits: 1-6