ACTUARIAL SCIENCE & RISK MANAGEMENT (ASRM)

ASRM Class Schedule (https://courses.illinois.edu/schedule/DEFAULT/DEFAULT/ASRM)

Courses

ASRM 199  Undergraduate Open Seminar  credit: 1 to 5 Hours.
Covers special topics. Approved for Letter and S/U grading. May be repeated in the same term up to 12 hours or separate terms up to 12 hours.

ASRM 210  Theory of Interest  credit: 3 Hours.
Study of compound interest and annuities; applications to problems in finance. Prerequisite: MATH 231 or equivalent.

ASRM 392  Actuarial Problem Solving  credit: 1 Hour.
Methods and techniques of solving problems in actuarial mathematics for advanced students intending to enter the actuarial profession. Approved for S/U grading only. May be repeated in the same or separate terms to a maximum of 4 hours. Prerequisite: Consent of instructor.

ASRM 401  Actuarial Statistics I  credit: 4 Hours.
Same as STAT 408. See STAT 408.

ASRM 402  Actuarial Statistics II  credit: 4 Hours.
Same as STAT 409. See STAT 409.

ASRM 406  Linear Algebra with Financial Applications  credit: 3 or 4 Hours.
Emphasizes techniques of linear algebra and introductory and advanced applications to actuarial science, finance and economics. Topics include linear equations, matrix theory, vector spaces, linear transformations, eigenvalues and eigenvectors and inner product spaces. In addition, current research topics such as modeling, data mining, and generalized linear models are explored. 3 or 4 undergraduate hours. 3 or 4 graduate hours. Credit is not given for both ASRM 406 (formerly MATH 410) and any of MATH 125, MATH 225, MATH 415 or MATH 416. 4 hours of credit requires approval of the instructor and department with completion of additional work of substance. Prerequisite: MATH 241; ASRM 210 (formerly MATH 210) or FIN 221; or consent of instructor.

ASRM 409  Stochastic Processes for Finance and Insurance  credit: 3 or 4 Hours.
An introduction to stochastic processes and their applications to finance and insurance. Topics include conditional probability, conditional expectation, Markov chains, Poisson processes, reliability theory, Brownian motion and elementary introductions to insurance risk theory and option pricing theory. 3 or 4 undergraduate hours. 3 or 4 graduate hours. Prerequisite: ASRM 401 (formerly MATH 408) or MATH 461.

ASRM 410  Investments and Financial Markets  credit: 3 Hours.
Theoretical foundation in financial models and their applications to insurance and other financial risks. Topics include derivative markets, no-arbitrage pricing of financial derivatives, interest rate models, dynamic hedging and other risk management techniques. 3 undergraduate hours. No graduate credit. Credit is not given for ASRM 410 (formerly MATH 476) and MATH 567. Prerequisite: Credit or concurrent registration in STAT 409 or STAT 410.

ASRM 450  Methods of Applied Statistics  credit: 3 or 4 Hours.
Same as STAT 420. See STAT 420.

ASRM 451  Basics of Statistical Learning  credit: 3 or 4 Hours.
Same as STAT 432. See STAT 432.

ASRM 453  Applied Bayesian Analysis  credit: 3 or 4 Hours.
Same as STAT 431. See STAT 431.

ASRM 461  Loss Models  credit: 3 Hours.
Foundation in the actuarial modeling process; construction, selection and validation of empirical models and parametric models. Also covers survival, severity, frequency and aggregate loss models; statistical methods to estimate model parameters. 3 undergraduate hours. No graduate credit. Credit is not given for ASRM 461 (formerly MATH 478) and ASRM 561 (formerly MATH 568). Prerequisite: ASRM 401 (formerly MATH 408), MATH 461 or MATH 463; credit or concurrent registration in ASRM 402 (formerly MATH 409) or MATH 464.

ASRM 469  Casualty Actuarial Mathematics  credit: 3 or 4 Hours.
An introduction to property/casualty actuarial science, exploring its mathematical, financial, and risk-theoretical foundations. Specific topics include risk theory, loss reserving, ratemaking, risk classification, credibility theory, reinsurance, financial pricing of insurance, and other special issues and applications. 3 or 4 undergraduate hours. No graduate credit. Credit is not given for ASRM 469 (formerly MATH 479) and ASRM 569 (formerly MATH 569). Prerequisite: ASRM 210 (formerly MATH 210); credit or concurrent registration in ASRM 402 (formerly MATH 409); or consent of instructor.

ASRM 471  Life Contingencies I  credit: 4 Hours.
Distribution of the time-to-death random variable for a single life, and its implications for evaluations of insurance and annuity functions, net premiums, and reserves. 4 undergraduate hours. 4 graduate hours. Prerequisite: ASRM 401 (formerly MATH 408) and ASRM 210 (formerly MATH 210).

ASRM 472  Life Contingencies II  credit: 3 Hours.
Continuation of ASRM 471. Introduction to tabular or parametric survival models with single or multiple-life states; life insurance and annuity premium calculations; reserving and profit measures; introductions to universal life insurances, participating insurances, pension plans and retirement benefits. 3 undergraduate hours. No graduate credit. Credit is not given for ASRM 472 (formerly MATH 472) and ASRM 575 (formerly MATH 565). Prerequisite: ASRM 471 (formerly MATH 471).

ASRM 510  Financial Mathematics  credit: 4 Hours.
Theoretical basis of financial models and their applications to insurance and other financial risks. Topics include derivative markets, no-arbitrage pricing of financial derivatives, interest rate models, dynamic hedging and other risk management techniques. 4 graduate hours. No professional credit. Credit is not given for ASRM 410 (formerly MATH 476) and ASRM 510 (formerly MATH 567). Prerequisite: ASRM 402 (formerly MATH 409) or MATH 464.

ASRM 551  Statistical Learning  credit: 4 Hours.
Same as CSE 542 and STAT 542. See STAT 542.

ASRM 561  Loss Data Analytics & Credibility  credit: 4 Hours.
Introduction to the actuarial modeling process: construction, selection and validation of empirical models and parametric models. Survival, severity, frequency and aggregate loss models; statistical methods to estimate model parameters. 4 graduate hours. No professional credit. Credit is not given for ASRM 461 (formerly MATH 478) and ASRM 561 (formerly MATH 568). Prerequisite: ASRM 401 (formerly MATH 408), MATH 461 or MATH 463.
ASRM 569  Extreme Value Theory and Catastrophe Modeling  credit: 4 Hours.
Principles and fundamental techniques of ratemaking for casualty and
property insurances; risk classification; coinsurance; estimation of
claim liabilities; financial reporting; catastrophe modeling. 4 graduate
hours. No professional credit. Credit is not given for ASRM 469 (formerly
MATH 479) and ASRM 569 (formerly MATH 569). Prerequisite: ASRM 401
(formerly Math 408).

ASRM 575  Life Insurance and Pension Mathematics  credit: 4 Hours.
Tabular and parametric survival models with single or multiple-life
states; life insurance and annuity premium calculations; reserving, and
profit measures; introduction to universal life insurances, participating
insurances, pension plans and retirement benefits. 4 graduate hours. No
professional credit. Credit is not given for ASRM 472 (formerly MATH
472) and ASRM 575 (formerly MATH 565). Prerequisite: ASRM 471
(formerly MATH 471).

ASRM 595  Advanced Topics in Actuarial Science and Risk Analytics
credit: 1 to 4 Hours.
Covers special topics in actuarial science and risk analytics. 1 to 4
graduate hours. No professional credit. May be repeated if topics vary.
Prerequisite: Consent of instructor.

ASRM 599  Thesis Research  credit: 0 to 16 Hours.
Research topics in actuarial science and risk analytics. 0 to 16 graduate
hours. No professional credit. Approved for S/U grading only. May be
repeated if topics vary. Prerequisite: Consent of Instructor.