

Summer 2005

Time: TuTh 8⁰⁰ – 9⁵⁰pm*Room:* FN 2.106

This course provides the Probabilistic and Statistical basis of Actuarial Mathematics and covers the theory and practice of stochastic modeling including techniques commonly used in insurance and finance. It covers most of the topics of EXAM M (former exam 3) "Actuarial Models" and EXAM C (former exam 4) "Construction and Evaluation of Actuarial Models" of the Associateship Examinations of Society of Actuaries and Casualty Actuarial Society. Quizzes and homework assignments will partially consist of the past official Associateship Exams.

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Texts: || LOSS MODELS, FROM DATA TO DECISIONS, by Klugman, Panjer, and Willmot, 2nd Edition, Wiley, 2004

|| Life tables, standard actuarial notations, and a few minor things are taken from:
 || ACTUARIAL MATHEMATICS, 2nd edition, by Bowers, Gerber, Hickman, Jones, Nesbitt;
 || Society of Actuaries, 1997 (not required)

The texts selected for this course are recommended by CAS Syllabus of Examinations

The grade consists of: || Two exams (1 hour each) = 30% each ||
 || Quizzes (15 min each) = 40% ||
 || 90-100% = A 75-90% = B 60-75% = C ||

The timing for the quizzes will be similar to the timing of the official Associateship Exams.

Course Description:

- §1. Introduction. Basic concepts of insurance (Klugman ch. 1, notes).
- §2. Loss distributions. Transformation, truncation, mixtures. Mean excess life, failure rate, survival function (Klugman ch. 2, 3).
- §3. Modeling. Frequency and severity models. Selecting, validating, and testing models (Klugman ch. 4, 5).
- §4. Estimation by simulation. Monte Carlo methods (Klugman, ch. 17, notes).
- §5. Aggregate risk models (Klugman ch. 6).
- §6. Survival models and life tables (Bowers, ch. 2, 3, Appendix 2-4, notes).
- §7. Stochastic processes and ruin models (Klugman, ch. 7-8).
- §8. Credibility (Klugman ch. 16).

This material is relevant to the exams M and C (former 3 and 4) of the Society of Actuaries and the Casualty Actuarial Society.