



Summer 2002
EVENING COURSE

Instructor: Ken Collins

Prerequisite:

None

Corequisite:

STAT 280 must precede or be taken concurrently

Required Text:

Actuarial Mathematics (2nd ed) by Bowers, Gerber, et al.; Publishers: Society of Actuaries

Courseware:

- R. D. Luce and H. Raiffa, "Games and Decisions," John Wiley, New York, 1996, 12-38.
- J. Pratt, "Risk Aversion in the Small and in the Large," Econometrica, Jan. - April 1964, 32, 122-36.
- J. Hadar and W. R. Russell, "Rules for Ordering Uncertain Prospects," Am.Econ. Rev., March 1969, 59, 25-34.
- R.C. Merton, "Optimum Consumption and Portfolio Rules in a Continuous Time Model," J. Econ. Theory, Dec. 1971, 3, 373-413.
- _____, "An Intertemporal Capital Asset Pricing Model," Econometrica, 41, 867-887.
- P. Samuelson, "Lifetime Portfolio Selection by Dynamic Stochastic Programming," Rev.Econ. Stat., Aug. 1969, 51, 239-46.
- F. Black and M. Scholes, "The Pricing of Options and Corporate Liabilities," J.of Pol. Econ., May/June 1973, 81, 637-54.
- J. C. Cox, S. A. Ross & M. Rubenstein, "Option Pricing: A Simplified Approach," J. of Fin. Econ., 1979, 7, 229-263.

Outline:

1. **The Economics of Insurance:** utility theory, optimal insurance. Exploration of risk tolerance measures as described by Pratt and others.
2. **Collective Risk Models for a Single Period:** aggregate claims, define compound Poisson distributions, approximations.
3. **Collective Risk Models Over an Extended Period:** define Poisson processes; ruin theory; and adjustment coefficient; discrete time model; first surplus below the initial level; maximal aggregate loss.
4. **Analyze the impact of reinsurance on probability of ruin and maximum aggregate loss.**
5. **Option Pricing Theory:** explore Black-Scholes formula as well as background research.

Note: This course covers part of the syllabus for Course 3 and background material for Course 4, and 6 and 8I of the Society of Actuaries

Grading:

The greater of:
Assignments - 10% and Final 100%
Midterms (2) - 40%
Final Exam - 50%
The grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

Revised February 2002