Course Outline: ACSC 419 001 Fall 2011
Construction of Actuarial Models

Tuesdays and Thursdays, 8:30-9:45 pm CW307.37
Final Exam December 13th, 9-12 am

Instructor

Peter Douglas, CW 307.24
585-4346 (w), 525-8368 (h)
douglas@uregina.ca (w)
lmurphy@accesscomm.ca (h)

Office Hours

Tuesdays and Thursday 1:00-3:00 pm
Mondays 9-11 am
Other times by appointment (note that I am off campus on Wednesdays and alternate Fridays)

Text: ***Loss Models from Data to Decisions,*** Klugman, Panjer and Willmot, third edition Chapters 13-16, 21
Students may also use Chapters 10-15, 17 of the second edition, although some material has been added to the 3rd edition.

Other Materials: A class website will be maintained URCourses. This will contain electronic copies of assignments, solution sets and other items of interest.

Overview

Note that while the University Calendar describes this course as covering Risk theory topics, this needs to be updated as ACSC 419 covers the construction of actuarial models. This material follows logically from the topics relating to loss models begun in ACSC 318. This material forms part of Society of Actuaries Exam C, under learning objectives F, G and I.

At the conclusion of the course students should be able to perform the following tasks:

1) Estimate failure time and loss distributions using Kaplan-Meier, Nelson-Åalen and Kernel density estimators
2) Estimate the parameters of failure time and loss distributions using Maximum Likelihood Estimation, the Method of Moments, and Percentile matching.
3) Estimate the variance of estimators and the confidence intervals for the distribution, parameters and functions of parameters of failure time and loss distributions.
4) Estimate the failure time and loss distributions with censored and/or truncated data.
5) Apply concepts such as Unbiasedness, Consistency and Mean Squared Error and Uniform Minimum Variance Estimator to fitted models.
6) Determine the acceptability of a fitted model using Graphical procedures, the Schwarz Bayes Criteria and the following tests: Kolmogorov-Smirnov, Anderson-Darling, Chi-square and Likelihood Ratio.
7) Apply simulation methods within the context of actuarial models.

A tentative class schedule has been posted on the class website. This will be updated during the term.

.

Course Requirements

1) Students are assumed to be familiar of the U of R General Calendar and of the calculus and the statistics topics covered in Chapter 12 of the Klugman, Panjer and Wilmot text.

2) There will be a series of class assignments (approximately 8-10).
   a. Completed assignments should be legible and bound or stapled together. You must clearly identify your assignments with your name and student number.

b. Assignments are due at the start of class on the assigned date (generally on Tuesdays). No credit will be granted for late papers.
c. At least one assignment will take the form of a 30-minute in class quiz using Society of Actuaries questions.
d. Some assignments will involve the use of Excel or similar packages.

3) There will be two midterm exams to be written in class time. The first midterm is on October 13th, and second will be on November 10th.

4) There is a term project to be completed for December 2, 2011. Students will be provided with a set of claims data from a simulated insurance portfolio and asked to model the risk characteristics of the portfolio. This project will require a written report.

5) The 3-hour final exam is scheduled for Tuesday December 13, 9-12 am (location to be announced).

6) For the midterms and final exams:
   a. Students are required to bring photo ID.
   b. Students should bring a non-programmable pocket calculator and be familiar with its functions. A set of tables and formula sheets will be provided for the exams. This will be the same set provided for the SOA Course C exam.
   c. Alternate arrangements may be made at the discretion of the instructor for students who provide prior notice and adequate documentation. However, the instructor reserves the right to deny such arrangements for students who have not completed the course assignments to date.

Actuarial Science Program

In addition, ACSC students are strongly encouraged to write the Society of Actuaries exams. Information on preliminary SOA exams can be found through the Be An Actuary website at http://www.beanactuary.org/exams/

Grading

Final grades will be based in on the average mark calculated as follows:

a) Assignments 10%
b) Midterms 30% (15% each)
c) Term project 10%
d) Final Exam 50%

The instructor reserves the right to

a) Fail a student who does not pass the final exam
b) Refuse to allow a deferred final to a student who has not completed the requirements of the course, or who does not receive a passing mark on the final exam.