Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: [Dr. Yi Lu](#)

Prerequisite:

ACMA 320

Required Text:

Loss Models: From Data to Decisions, 3rd Edition, 2008, S.A.Klugman, H.H. Panjer and G.E. Willmot; Publisher: Wiley

References:

ACTEX Study Manual for SOA Exam C and CAS Exam 4, Fall 2005 Edition, by S.A.Broverman, Publisher: ACTEX
Survival Models and Their Estimation, 3rd Edition, by D. London, Publisher: ACTEX

Calendar Description:

Quality of an estimator: unbiasedness, asymptotic unbiasedness, consistency, means squared error, uniform minimum variance. Confidence interval. Tests of hypotheses. Estimation for complete data. Estimation for grouped data. Estimation for modified data: Kaplan-Meier estimator, variances and confidence intervals of the empirical estimator, kernel density estimator. Parameter estimation. Variance of the estimators and confidence intervals. Model selection: graphical procedures, goodness-of-fit test, likelihood ratio test. Interpolation and smoothing. Covers part of the syllabus for Exam C of the Society of Actuaries and Exam 4 of the Casualty Actuarial Society. **Quantitative.**

Outline:

This course covers the fundamentals of actuarial loss models. The topics covered correspond to chapters 9-14 of the required text and the study notes from SOA for Exam C. They include the following:

1. Review of mathematical statistics: point estimation, interval estimation, tests of hypotheses.
2. Estimation for complete data: empirical distributions for complete, individual data and grouped data.
3. Estimation for modified data: point estimation, Mean, variance, and interval estimation, kernel density models, approximations for large data sets.
4. Parameter estimation: method of moments and percentile matching, maximum likelihood estimation, variance and interval estimation, Bayesian estimation, estimation for discrete distribution.
5. Model selection: representations of the data and model, hypothesis tests, two types of selection criteria, extreme value models, copula models, models with covariates.
6. Risk measures: value at risk, conditional tail expectation.

Grading Scheme:

Assignments – 10%
Midterm 1 – 35%
Midterm 2 – 35%
Project – 20% (Presentation 5%, Report 15%)
Grading is subject to change.

Revised October 2009