ACSC 3750/STAT 3750, Credibility Theory

The course is open to anyone who has successfully completed or who is currently taking ACSC 3703/STAT 3703.

Calendar description:

Credibility theory deals with the difficulty in combining information from two samples, one of which is small but very relevant, the other is large but less relevant. In this course, we will study different approaches to dealing with this problem.

Course description:

It is intended that this course should cover a portion of the syllabus for that part of the professional actuarial examination concerned with the Construction and Evaluation of Actuarial Models. Currently, this corresponds to most of the material listed above from Chapters 17–19 that is on the syllabus for the Society of Actuaries Exam C. This course syllabus should be updated as needed, with this objective in mind.

Evaluation:

6–8 assignments (15%), midterm (30%), closed-book final exam (55%)

Textbook

Loss Models: From Data to Decisions, 4th Edition, 2012, S.A.Klugman, H.H. Panjer and G.E. Willmot; Publisher: Wiley

Other relevant references (not required) include:

Introduction to Credibility Theory, 4th Edition, 2010, Herzog, T.N.;

Foundations of Casualty Actuarial Science 4th Edition, 2001, Casualty Actuarial Society, Chapter 8, available at:

`http://www.soa.org/files/pdf/C-21-01.pdf`

Topics

This course covers the fundamentals of credibility theory, as applied to insurance contexts. The topics covered correspond to chapters 17–19 of the required text and the study notes from SOA for Exam C. They include the following:

1. Introduction and Limited fluctuation credibility: limited fluctuation credibility theory; full credibility; partial credibility; problems with the approach
2. Greatest accuracy credibility: conditional distributions and expectation; Bayesian methodology; credibility premium; the Bühlmann model; the Bühlmann-Straub model; exact credibility
3. Empirical Bayes parameter estimation: Nonparametric Estimation; Semiparametric estimation