

**ACTU 459 (MAST 726)**

Loss Distributions

*Winter 2016*

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**Office Hours:** Mondays-Wednesdays: 16:15–17:45.

**Class Schedule:** Mondays-Wednesdays: 14:45-16:00 in H 565, SGW Campus.

**Goal:** The problem of fitting probability distributions to loss data is studied. In practice, heavy tailed distributions are used (i.e. skewed to the right) which require some special inferential methods. The problems of point and interval estimation, test of hypotheses and goodness of fit are studied in detail under a variety of inferential procedures (empirical, maximum likelihood and minimum distance) and of sampling designs (individual/grouped data, truncation and censoring). Loss data sets serve as illustration of the methods.

A reasonable understanding of undergraduate mathematical statistics is the only prerequisite for the course. The statistical package S-Plus or the (shareware) statistical software R or the spreadsheet EXCEL application will be used for data analysis.

The course prepares for the Loss Models part of the Society of Actuaries Exam C and the Casualty Actuarial Society Exam 4. It also covers more advanced material, as needed to use modern loss models with real insurance data. A grade of B or better is needed to apply to the Canadian Institute of Actuaries for exemption of Exam C.

**Text:** Klugman, S.A., Panjer, H.H. and G.E. Willmot (2012) "Loss Models", 4th Edition, Wiley, New York, Chapters 3-7, 10-16 (you can also use the 3rd Edition, 2008 if you already owe a copy).

**Other texts:** Klugman, S.A., Panjer, H.H. and G.E. Willmot (2008) "Loss Models", 3rd Edition, Wiley, New York, Chapters 12-19.

Hogg, R.V., McKean, J.W. and A.T. Craig (2005) "Introduction to Mathematical Statistics", 6th Edition, Pearson, Upper Saddle River, NJ.

Lawless, J.F. (2003) "Statistical Models and Methods for Lifetime Data", 2nd Edition, Wiley, Hoboken, NJ.

Daykin, C.D., Pentikäinen, T. and M. Pesonen (1994) "Practical Risk Theory for Actuaries", Chapman and Hall, London.

**Calculators:** The only calculators allowed in exams for this course are the ones approved by the Math Department or the battery- or solar-powered Texas Instrument calculators, models BA-II Plus\*, BA-II Plus, TI-30X, TI-30Xa (the official CAS calculator) or TI-30X II\*.

**Assignments:** There will be no assignment, the evaluation is based on three tests and the modeling project (oral and report). There will be no make-up tests.

<b>Tests and Project:</b>	Test 1:	Week 5
	Test 2:	Week 9
	Test 3:	Week 12
	Project Orals and Reports:	Week 13-15

**Final Grade:** The final grade will be determined as follows:

a) Tests:	80% (25-25-30)
b) Project Oral:	5%
c) Project Report:	15%