

ACTU 459 (MAST 726/MAST 881), Sec. E
Loss Distributions
Winter 2023

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Class Schedule: Mondays-Wednesdays: 14:45-16:00.

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 of sampling designs (individual/grouped data, truncation and censoring). Loss data sets serve as illustration of the methods.

The statistical package S-Plus or the (shareware) statistical software R or the spreadsheet EXCEL application will be used for data analysis.

A grade of B or better is needed in this course and in Actu-457 and ACTU 459, to apply to the Canadian Institute of Actuaries for exemption of Exams STAM (see

<https://www.concordia.ca/artsci/math-stats/programs/undergraduate/accredited-programs.html>).

In addition to the university's internal policies on conduct, including academic misconduct, candidates pursuing credits for writing professional examinations shall also be subject to the [Code of Conduct and Ethics for Candidates in the CIA Education System](#) and the associated [Policy on Conduct and Ethics for Candidates in the CIA Education System](#). For more information, please visit [Obtaining UAP Credits](#) and the [CIA FAQ](#).

Text: Klugman, S.A., Panjer, H.H. and G.E. Willmot (2012) "Loss Models", 4th Edition, Wiley, New York ; you can also use the 3rd (or 4th) Edition, 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.

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.

Calculators: The only calculators allowed in exams for this course are the ones approved by the SOA/CAS exams: the Texas Instrument calculator models BA-35, BA-II Plus, BA-II Plus Professional, TI-30Xa, TI-30XII (IIS solar or IIB battery), TI-30XS MultiView (or XB battery). This rule will be strictly enforced.

Assignments: There will not be graded assignments. The evaluation is based on three tests and the modeling project (oral and report). There will be no make-up exams.

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

- a) 3 Exams: 80% (that is 30%, 25% and 25%, respectively)
- b) Project Oral: 5%
- c) Project Report: 15%

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: concordia.ca/students/academic-integrity." [*Undergraduate Calendar, Sec 17.10.2*]

Use of Zoom

Note: Zoom is included as an institutionally-approved technology. This means we have been assured of the privacy protections needed to use freely within the classroom)

Zoom might be used in this course to facilitate learning at a distance. It may be used to record some or all of the lectures and/or other activities in this course. If you wish to ensure that your image is not recorded, speak to your instructor as soon as possible.

Also, please note that you may not share recordings of your classes and that the instructor will only share class recordings for the purpose of course delivery and development. Any other sharing may be in violation of the law and applicable University policies, and may be subject to penalties.

Behaviour

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the [Code of Rights and Responsibilities](#) which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in University activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Intellectual Property

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the [Academic Code of Conduct](#) and/or the [Code of Rights and Responsibilities](#). As specified in the [Policy on Intellectual Property](#), the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Extraordinary circumstances

In the event of extraordinary circumstances and pursuant to the [Academic Regulations](#) the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the change.