

**ACTU 459 (MAST 726/MAST 881), Sec. E**  
Loss Distributions  
*Winter 2021*

**Preface:** Due to exceptional circumstances, this course will be taught and all assessments will be done completely online. The exams will be held online through the Moodle platform. There will be video lectures via Zoom during the scheduled course hours and the slides will be subsequently posted on Moodle.

**Instructor:** Dr. I. Cojocaru,  
Email: [ionica.groparu-cojocaru@concordia.ca](mailto:ionica.groparu-cojocaru@concordia.ca)

**Class Schedule:** Mondays-Wednesdays: 14:45-16:00.  
Online via Zoom link (refer course Moodle page).

**Office Hours:** TBA.  
The office hours will be held over Zoom and one can also send questions via email. Note that the system does not allow one to reply to a letter sent from Moodle. So emails should be sent from one's own mailer, not Moodle.

**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 method. 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 (SOA) Exam STAM and the Casualty Actuarial Society (CAS) Exam MAS-I. It includes the more advanced material needed for the CAS exam. A grade of B or better is needed in this course, as well as in Actu-457 and 459, to apply to the Canadian Institute of Actuaries (CIA) for exemption of Exam STAM of the SOA. Note that for the moment the CIA does not give exemptions for MAS-I or MAS-II.

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, Chapters 3-7, 10-16 (you can also use the 3rd Edition, 2008 if you already owe a copy).

The textbook will be available at:

<https://www.bkstr.com/concordiastore/home>

**Note:** Students should order textbooks as early as possible, especially for print versions in case books are backordered or there are any shipping delays.

**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.

**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).

**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 tests.

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

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

**There is no option for a 100% final or supplemental exam.**

*Students who require additional accommodations for their exams due to a documented disability should contact the Access Centre for Students with Disabilities as soon as possible. If you face issues during the exam, you should inform your professor of those issues immediately.*

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](http://concordia.ca/students/academic-integrity)." [*Undergraduate Calendar, Sec 17.10.2*]

### **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.