Department of Mathematics and Statistics
Concordia University

ACTU 457 (MAST 724/MAST 881), Sec. O
Risk Theory
Winter 2026

Instructor: Prof. Melina Mailhot
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Class Schedule: Tuesdays & Thursdays, 10:15-11:30 AM.
Note: There will be a mid-term break from March 2 to March 8.

Office Hours: Tuesdays & Thursdays, 9:15-10:00 AM.

Outline: Risk theory forms the core part of Property-Casualty Insurance mathematics. The course gives an introduction to classical models and applies them to some common problems of interest in risk theory.

The emphasis is on the probabilistic aspects (stochastic processes) although some estimation (inference) questions will also be discussed. The topics include (but are not limited to) aggregate risk models, homogenous and non-homogenous Poisson processes, coinsurance, effects of inflation on losses, risk measures (VaR, TVaR) and Generalized Linear Models.

This course is required to access the Capstone examination from the accreditation program of the Canadian Institute of Actuaries (CIA) under the University Accreditation Program (UAP).

Text: "*Loss Models*", S.A. Klugman et al., Wiley, New York, 2012, 4th Edition.
The textbook will be available at:
https://www.bkstr.com/concordiastore/home
Note: Students should order textbooks as early as possible, especially for printed versions in case books are backordered or there are any shipping delays.

Calculators: The only calculators allowed in tests or at the final exam for this course are those allowed at SOA/CAS exams: the Texas Instrument calculator models BA-35, BA-II Plus* BA-II Plus Professional Edition, TI-30XS MultiView, TI-30Xa, TI-30XIIS, TI-30XIIB or TI-30XM MultiView. This rule will be strictly enforced.

* The memory of TI–30X II (IIS solar or IIB battery), TI-30X MultiView (XS Solar or XB Battery), BA II Plus, and BA II Plus Professional will need to be cleared by the examination supervisor upon the candidates' entrance to the examination room. For the BA II Plus and BA II Plus Professional, clearing will reset the calculator to the factory default settings.

For a list of Department Approved calculators see
www.concordia.ca/artsci/math-stats/services.html

Assignments: The assignments will count 10% towards your final grade and should be submitted as PDF files to the Moodle site. An announcement will be made on how to do this. Solutions must be written up carefully, showing all work for full credit. No late assignments will be accepted.

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.

Tests and Final: There will be one class mid-term exam in the seventh week of classes counting for 40% of your final mark and a final examination counting for the remaining 50%. **There is no option for a 100% final or supplemental exam.** The grading scheme used to convert percentage marks into corresponding letter grades is given at the following webpage http://www.concordia.ca/artsci/math-stats/programs/grading.html, then to convert letter grades to a Grade Point Average (GPA) see the formula at http://www.concordia.ca/academics/undergraduate/calendar/current/sec16/16.html#b16.3.11 under article 16.3.11.

Final Exam: It will be scheduled by the Exams Office.

PLEASE NOTE: Students are responsible for finding out the date and time of the final exam once the schedule is posted by the Examination Office. Any conflicts or problems with the scheduling of the final exam must be reported directly to the Examination Office, **not** to your instructor. It is the Department's policy and the Examination Office's policy **that students are to be available until the end of the final exam period. Conflicts due to travel plans will not be accommodated.**

CIA Accreditation: This course is a mandatory component of the Canadian Institute of Actuaries (CIA) University Accreditation Program at Concordia University. Successful completion of this course is required for students pursuing the Associate of the CIA (ACIA) designation through Pathway 1. Students must successfully complete all *CIA-mandatory courses* within their actuarial degree to be eligible to register to the ACIA Capstone Exam.

Participants to CIA educational activities must act in a professional manner to uphold the reputation of the profession and specifically must act in accordance with the *CIA's Code of Conduct and Ethics for Participants in the CIA Education System*. In addition, Students and Candidate members of the CIA are subject to the *CIA Rules of Professional Conduct*.

Student Services

You may wish to access the many services available to you as a Concordia student. An overview of these resources can be found here: https://www.concordia.ca/students/services.html

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: https://www.concordia.ca/conduct/academic-integrity.html" *[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.