Department of Mathematics & Statistics
Concordia University

> **MAST 336**
> Insurance Mathematics
> *Fall 2023*

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Class Schedule: Mondays and Wednesdays, 16:15-17:30.

Office hours: TBA.

Goal: This course intends to introduce the student to some techniques used by life insurers and Property & Casualty insurers to quantify and measure their liabilities. The course is subdivided into two main parts. The first aims at studying life-contingent liabilities such as life insurance and annuities. Life distribution related probabilities are studied and used to measure the actuarial present value of cash flows generated by life-contingent insurance contracts. The second part provides an overview of methods employed by Property & Casualty insurers to represent their liabilities. Frequency and severity models are discussed. Aggregate claims models are illustrated.

Prerequisite: MAST 221 or equivalent and MAST 335 or equivalent.

Reference: *Actuarial Mathematics for Life Contingent Risks,* 3rd Edition, by D.C.M. Dickson, M.R. Hardy, and H.R. Waters, Cambridge University Press, 2019.
Loss Models, 5th Edition, by Klugman, S.A., Panjer, H.H., and G.E. Willmot, Wiley, New York (you can also use the 4th Edition, if you already own a copy).

Test: There will be one midterm test (closed book exam) held in class. The exact date will be announced in class during the first 2-3 weeks.

There is no make-up for a missed midterm test.

The final examination (closed book exam) will be three hours long and will cover material from the entire course.

Note: Students are responsible for finding out the date and time of the final exams once the schedule is posted by the Examinations Office. Conflicts or problems with the final exam scheduling must be reported directly to **the Examinations Office**, **not to your instructor.**

Grading Scheme: **The final grade** will be based on the higher of (A) or (B) below:

Option (A): the weighted average of assignments (10%), the Midterm (30%), and the Final Exam (60%), **or**

Option (B): the weighted average of assignments (10%) and of the Final Exam (90%).

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.

Note: **THERE WILL BE NO SUPPLEMENTAL FOR THIS COURSE AND NO 100% OPTION FOR THE FINAL EXAM.**

Midterm break: Tuesday, October 10 - Sunday, October 15.
Monday, October 9-Thanksgiving Day, the university closed.

Calculators: The only calculators allowed in exams for this course are either the Math and Stat-approved calculators with the sticker 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*.

* 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.

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.