Department of Mathematics & Statistics
Concordia University

ACTU 256
Mathematics of Finance
Fall 2025

Instructor: Dr. Mélina Mailhot
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Class Schedule: Fridays, 8:45-11:30 AM.
Mid-term break: no classes between October 11, 2025, and October 17, 2025.

Office Hours: TBA.

Text: *Mathematics of Investment and Credit*, by Broverman, S. A., 7th Edition ACTEX, 2017, Chapters 1-9.
https://www.actexmadriver.com/samples/ACTEX_2FM-ACT-882216_sample_12-18-17.pdf

The digital and print versions of 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 back ordered or there are any shipping delays.

Outline: This course is an introduction to the mathematics of compound interest. The topics covered correspond approximately to the interest theory of Exam FM of the Society of Actuaries. The topics include (but are not limited to):

- ***Measurement of Interest:*** simple interest, compound interest, accumulation functions, present value, effective and nominal rates, forces of interest;
- ***Equations of Value:*** basic problem, numerical results, unknown time, unknown rate of interest;
- ***Basic Annuities:*** payments at a different frequency than interest is convertible, continuous annuities, varying annuities;
- ***Amortization Schedules and Sinking Funds:*** outstanding loan balance, varying series of payments, continuous payments;
- ***Bonds and Other Securities:*** types of securities, price of a bond, premium and discount, yield rates, callable bonds, serial bonds;
- ***Yield Rates:*** cash flow analysis, reinvestment rates;
- ***Applications and others:*** modern financial instruments, inflation, duration, immunization, asset liability management, term structure of interest rates, other topics.

CIA Accreditation: This course is accredited by the Canadian Institute of Actuaries (CIA) under the University Accredited Degree. For more information click here.

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.

The most recent detailed syllabus and learning objectives for Exam FM can be found at: https://www.soa.org/education/exam-req/edu-exam-fm-detail.aspx

Course Evaluation:

Assignments: counting for **10%** (students should submit their assignments before the beginning of class on the announced due date). 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.

1 Mid-term exams: counting for **30%**.
1 Final project report (last class): counting for **10%**
1 Final exam: counting for the remaining **50%.**
There will be no make-up tests.

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.**

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

Calculators: Only calculators approved by the Department (with a sticker attached as proof of approval) or approved by the Society of Actuaries (SOA) are permitted in the class test(s) and final examination.

The list of calculators approved by the Society of Actuaries is here:
https://www.soa.org/education/exam-req/exam-day-info/edu-calculators.aspx

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

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.