Department of Mathematics & Statistics
Concordia University

MACF 301
Introduction to Quantitative Finance
Fall 2025

Instructor: Prof. F. Godin
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Office Hours: Tuesdays, 10:30-12:00.

Class Schedule: Tuesdays and Thursdays, 13:15-14:30.
Note: There will be a mid-term break from October 11 to October 17.

Optional References: *Derivatives Markets* (Third Edition), 2013, by McDonald, R.L., Pearson Education.
Corporate Finance (Fourth Edition), 2017, by Berk, J. and DeMarzo, P., Pearson.
SOA Study Note: IFM-22-18: Actuarial Applications of Options and Other Financial Derivatives
SOA Study Note: IFM-21-18: Measures of Investment Risk, Monte Carlo Simulation, and Empirical Evidence on the Efficient Markets Hypothesis.

Outline: This course is an introduction to several topics related to quantitative finance:

- **Funding sources for companies**: equity and debt instruments.
- **Mean-variance portfolio theory:** mean-variance setting, efficient frontier, capital market line.
- **Asset pricing models**: CAPM, factor models.
- **Investment Risks:** risk measures.
- **Elements of corporate finance:** impact of capital structure on company value.
- **Financial derivatives:** derivatives specification and cash flows, static no-arbitrage relationships, futures contract.
- **Binomial option pricing models**: risk-neutral pricing, replicating portfolio.
- **Black-Scholes option pricing model**: lognormal model, Black-Scholes formula, historical volatility.
- **Derivatives risk management**: Greeks, hedging.
- **Behavioral finance**: efficient market hypotheses, market anomalies.

Evaluation: The course mark will be determined by a mid-term exam (25%), a final exam (55%), and assignments (20%). The mid-term exam will be held before the mid-term break, on **Thursday, October 9**.

NOTE: It is the Department's policy that tests missed for any reason, **including illness,** cannot be made up. If you missed the midterm because of illness (to be confirmed by a **valid medical note),** the final exam can count for 80% of your final grade and 20% will be contributed by the assignments.

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.

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 accredited by the Canadian Institute of Actuaries (CIA) under the University Accreditation Program (UAP).

In addition to the university's internal policies on conduct, including academic misconduct, candidates pursuing CIA designations 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 University Accreditation Program and the CIA FAQ.

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.

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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.