Department of Mathematics & Statistics
Concordia University

MACF 301
Introduction to Quantitative Finance
Fall 2022

Instructor: Dr. Y. Lu, Office: LB 921-21 (SGW), Phone: (514) 848-2424, Ext. 2948
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Office Hours: Tuesdays and Thursdays 15:00-17:00.

Class Schedule: Tuesdays and Thursdays, 13:15-14:30.

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

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

- **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.
- **Mean-variance portfolio theory:** mean-variance setting, efficient frontier, capital market line.
- **Asset pricing models**: CAPM, factor models.
- **Investment Risks:** risk measures.
- **Behavioral Finance:** efficient market hypothesis (EMH), anomalies, behavioral biases.

Evaluation: The course mark will be determined by a mid-term exam (30% weight), a final exam (50% weight) and assignments (20% weight).

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.

CIA Accreditation: This course is accredited by the Canadian Institute of Actuaries (CIA) under the University Accreditation Program (UAP). A grade of B+ or better in this course is needed to apply to the CIA for the exemption of Exam IFM. Please note that due to exceptional circumstances associated with online teaching this semester, the B+ threshold could be revised by the CIA after final grades are audited.

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.

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.

Use of Zoom
Note: Zoom is included as an institutionally-approved technology. This means we have been assured of the privacy protections needed to use freely within the classroom.

Zoom might be used in this course to facilitate learning at a distance. It may be used to record some or all of the lectures and/or other activities in this course. If you wish to ensure that your image is not recorded, speak to your instructor as soon as possible.

Also, please note that you may not share recordings of your classes and that the instructor will only share class recordings for the purpose of course delivery and development. Any other sharing may be in violation of the law and applicable University policies, and may be subject to penalties.

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.