Department of Mathematics & Statistics
Concordia University

> ## MAST 397 (Sec. A)
> Topics in Mathematics and Statistics
> ***Fall 2019***

Instructor: Dr. F. Godin, Office: LB 921-05 (SGW), Phone: (514) 848-2424, Ext. 3494
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Office Hours: Tuesdays and Thursdays, 15:00-16:00.

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

Optional Reference: *Derivatives Markets* (Third Edition, 2013, by McDonald, R.L. Pearson Education.
Corporate Finance (Fourth Edition), 2017, by Berk, J. and DeMarzo, P., Pearson.
Portfolio Theory and Risk Management, 2014, by Capinski, M. and Kopp, E., Cambridge University Press.
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). A grade of B+ or better in this course is needed to apply to the CIA for the exemption of Exam IFM. For more information, click here.

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: concordia.ca/students/academic-integrity." *[Undergraduate Calendar, Sec 17.10.2]*