Department of Mathematics & Statistics
Concordia University

MACF 491 (ACTU 491/MAST 729/MAST 881), Sec. I
Stochastic Calculus
Topics in Mathematical & Computational Finance
Fall 2023

Instructor: Dr. W. Sun, Office: LB 921-17 (SGW), Phone: 514-848-2424, Ext. 5218
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Schedule: Mondays & Wednesdays, 11:45-13:00.

Office Hours: TBA.

Reference Books: *Brownian Motion and Stochastic Calculus* by I. Karatzas and S.E. Shreve, Springer.
Stochastic Differential Equations by B. Oksendal, Springer.

Homework: There will be 3 assignments.

Mid-term break: Tuesday, October 10 - Sunday, October 15, 2023.

Exam: There will be a take-home final exam. No midterm exam.

Grading:
a) Homework (30%)
b) Presentation (20%)
c) Final Exam (50%)

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

Topics: This course introduces the basic ideas and methods of stochastic calculus. Topics covered include:

1) Martingales.
2) Brownian motion and Markov processes.
3) Stochastic integrals, Ito's formula, and Girsanov theorem.
4) Stochastic differential equations.

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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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.