Department of Mathematics & Statistics
Concordia University

MACF 491 (STAT 497/MAST 679/881), Sec. L
Topics in Mathematics & Computational Finance
Fall 2020

Instructor: Dr. F. Godin
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Office Hours: Please contact the instructor by email; online appointments through Zoom can be arranged.

Class Schedule: Monday and Wednesday, 8:45-10:00. However, the class is fully online, and lectures are pre-recorded and available on Moodle (no live lecture is given).

Text: *Reinforcement Learning: An Introduction*, by R.S. Sutton and A.G. Barto, 2nd Edition, MIT Press. Available for free online at http://incompleteideas.net/book/the-book-2nd.html

Outline: This course is an introduction to reinforcement learning techniques. It requires extensive programming with the R language. Topics covered include:

- Multi-armed bandit problem
- Markov Decision Problems
- Dynamic Programming
- Monte-Carlo solution methods
- Temporal difference methods
- Multi-period
- Approximation methods
- Policy gradient

Evaluation: The course mark will be determined by a take-home final exam (40% weight), assignments (30% weight) and a team project (30% 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.

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].*

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Disclaimer: In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in the course is subject to change.