

STAT 449 (MAST 671/881), Sec. B
Advanced Probability
Fall 2022

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Office Hours: TBA.

Textbook: *Probability and Random Processes*, by G. R. Grimmet and D. R. Stirzaker.

Homework: There will be about 5 assignments.

Exams: There will be one midterm exam. The schedule of the exam will be announced later. **NO MAKE-UP EXAMS.**

Grading:

- Homework (10%)
- Midterm Exam (30%)
- Final Examination (60%)

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 will cover the materials from Chapters 1, 3, 4, 5, 7 and, 12 including:

- Discrete and continuous random variables, indicator functions.
- Conditional probability and conditional expectation.
- Generating functions and characteristic functions, limit theorems.
- Random walk, branching process, Poisson process.
- Convergence of random variables, modes of convergence.
- Introduction of martingales, martingale convergence theorem, optional stopping.

Week	Topics to be covered
1	Section: 1.1 - 1.3, 3.1-3.3
2	Section: 3.4 - 3.7
3	Section: 4.1- 4.8
4	Section: 5.1 - 5.3
5	Section: 5.4 - 5.5
6	Section: 5.7 - 5.10
7	Section: 5.11
8	Section: 7.1 - 7.3
9	Section: 7.4, 7.10
10	Section: 7.7, 7.8
11	Section: 12.1, 12.4, 12.5
12	Review
13	Presentations by graduate students

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.

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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.

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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.