Department of Mathematics & Statistics
Concordia University

MATH 467 (MAST 669/MAST 837), Sec. D
Measure Theory
Fall 2024

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Class Schedule: Mondays & Wednesdays, 2:45-4:00 PM in H 507.
Mid-term break: no class between October 15, 2024, and October 20, 2024.

Office Hours: TBA (taking into consideration students' availability)

Textbook: *Measure, Integration & Real Analysis,* by S. Axler, Springer, 2020.
https://measure.axler.net/

Other Textbooks: *Real Analysis, Measure Theory and Integration,* by E.M. Stein and R. Shakarchi, Princeton University Press, 2005.

Functional Analysis, by E.M. Stein and R. Shakarchi, Princeton University Press, Macmillan, 2011.

Real Analysis: Modern Techniques and Their Applications, by G.B. Folland, Wiley, 2013.

Real Analysis, by H.L. Royden (3rd or 4th Edition).

Topics: The main part of the course will consist of the following topics taken from the text:

- Outer measure, Lebesgue measure on R, positive measures (Ch. 2)
- Lebesgue integration and convergence theorems (Ch. 3)
- Product measures (Ch. 5)
- Lebesgue (L^p) spaces (Ch. 7)

Additional topics may be covered if time permits. Some additional topics may be assigned to graduate students for independent reading.

Prerequisites: Previously or concurrently: real analysis/metric spaces (equivalent to MATH 464)

Assignments: Homework will be assigned approximately once every two weeks, posted on Moodle. The solutions should be submitted electronically on Moodle by the due date. Students are expected to stay informed of when each assignment is due. **Late assignments will not be accepted for any reason.** Instead, each student can request one 2-day extension for an assignment once in the semester. This request must be communicated to the instructor in writing at least a day before the assignment is due.

Collaboration on homework assignments is allowed and encouraged. However, the work you submit must be written by you, in your own words and your own writing style. The loaning or copying of solutions from any source is strictly forbidden.

A representative subset of each assignment will be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt and submit all assigned problems. Understanding of all homework problems is essential to succeed in the course.

Midterm Exam: There will be an in-class test in week 6 or 7. The exact date of the exam will be announced in class at least a week in advance.

It is the Department's policy that tests missed for any reason, including illness, **cannot be made up**. If you miss the midterm because of illness (**Short-Term Absence form or valid medical note required**) the weight of this test will be moved to the final exam.

Final Exam: The final examination will be a 3 hours long exam, scheduled by the Examinations Office. To obtain a good grade students must demonstrate a thorough understanding of the subject and good problem solving skills. Students are responsible for finding out the date, time and location of the final exam once the schedule is posted by the Examinations Office. Conflicts or problems with the scheduling of the final exam must be reported directly to the Examinations Office. It is the Department's policy and the Examinations Office's policy that students are to be available until the end of the final exam period. Conflicts due to travel plans cannot be accommodated.

Presentation: Graduate students will be required to prepare and give an hour-long presentation during the semester on a topic related to the class. A list of suggested topics will be provided. It is also possible to decide on a topic outside this list in consultation with the instructor.

Evaluation:	Homework 15%, Midterm exam 25%, Final exam 60%

Graduate students will be required to do additional or alternative work, to be determined. Their grade will be evaluated as follows:
Homework 15%, Midterm exam 25%, Final exam 50%, Presentation 10%.

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.

Grading policies: Late submissions are not accepted and will not be graded.
Students are responsible for making sure their submissions are clear and legible. The graders reserve the right to not grade submissions that are, in their view, illegible.
All grading disputes must be brought to the attention of the instructor within a week of the graded assignment or test being returned.

Communication: Communication between the students and the instructor will take place in person and online via lectures, Zoom meetings, Moodle announcements, and email messages. **Students are responsible for reading and taking note of all electronic communication from the instructor and the University.**

You should regularly monitor the course website on Moodle for announcements regarding the course; all important communication will be made available there.

You are expected to attend the lectures unless unforeseen circumstances arise. If for some serious reason you have to miss multiple lectures or exams, you should inform the instructor as soon as possible so we can plan for the best way to help you stay on track.
Your active participation in the classroom is highly encouraged and will always be welcome. Please don't hesitate to ask questions!

The office hours will be decided taking students' availability into consideration, so please fill out the relevant survey. Finding times that work for everyone is a difficult (if not impossible) task, but I will do my best to make my office hours accessible to as many students as possible.

You should also feel free to email me for any pressing questions or if you cannot make it to office hours that week. I usually reply within a day during the week. I will also be available to meet by appointment, either in person or on Zoom.

I encourage you to make use of these opportunities to discuss the material with me and your classmates. I expect you to invest a lot of time and energy into this course, but I am committed to helping you learn and enjoy the material and will do my best to help you succeed.

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]*

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.

Intellectual Property

Content belonging to instructors shared in courses, including, but not limited to, 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 a 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.