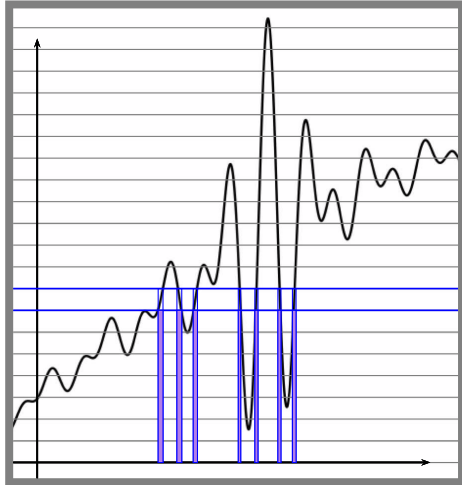




Dalhousie University
Department of Mathematics and Statistics

MATH 4010
Measure Theory and Integration
Fall 2020

INSTRUCTOR: Andrea Fraser, Assoc. Professor

afraser@mathstat.dal.ca

OFFICE HOURS: Office hours (held using Collaborate Ultra or Zoom) will be posted regularly on Brightspace. You can also seek help by email at any time.

LECTURES: Monday, Wednesday, Friday: 10:35am - 11:25am, synchronous via Collaborate Ultra or Zoom, at some or all of the weekly class times.

COURSE DESCRIPTION:

Measure theory and Lebesgue integration. Topics include sigma-algebras, measures, construction of measures, Lebesgue measure on the real line, measurable functions, the Lebesgue integral and convergence theorems, L^p -spaces, product measures, Fubini and Tonelli theorems.

PREREQUISITES: MATH 3501.03

CROSS-LISTING: MATH 5010.03

COURSE OBJECTIVES:

This course covers the fundamental concepts and major results of Lebesgue integration, which are needed for continuing in analysis and applied analysis.

COURSE MATERIALS:

No required text. All course material will be available through the MATH 4010 course space on Brightspace. Lectures notes (for the streamed lectures) will be posted on Brightspace.

RECOMMENDED TEXT:

Real Analysis: Modern Techniques and Their Applications, G. B. Folland (Wiley-Interscience).

COURSE ASSESSMENT:

Tests: **Oct 14, Nov 23, and Dec 8**

75%

Available on Brightspace at 10:35am. Must be submitted on Brightspace by 12:35pm.

(30% and 35% - your better of the first two test counts for more; and 10% for Test 3)

Assignments: **due each Wed (except weeks of tests) and Mon Dec 7**

25%

Available a week in advance. Must be submitted on Brightspace by 10:35am.

(2.5% each)

CONVERSION OF GRADES: Follows the Dalhousie Common Grade Scale.

90 – 100 A+	77 – 79.9 B+	65 – 69.9 C+	50 – 54.9 D
85 – 89.9 A	73 – 76.9 B	60 – 64.9 C	0 – 49.9 F
80 – 84.9 A-	70 – 72.9 B-	55 – 59.9 C-	

COURSE POLICIES:

Course announcements: Any announcements regarding the course will be made on Brightspace or by email. You are expected to check Brightspace and email regularly.

Working on assignments: Assignments are designed to help you learn by prompting you to explore concepts on your own and helping you to familiarize yourself better with material. The process of interpreting what is being asked in a problem and establishing what you must show in order to solve it can be difficult at first but with perseverance will force you to improve your grasp on terminology and the subtleties of logic involved. Rather than turning to the internet or other sources of help when you are given a question, it is important that you make the effort to delve into it by yourself. If you are still having difficulty after making a genuine effort, you may consult your instructor for guidance and hints. You may also discuss assignment questions with your classmates, but you should not leave a discussion with anything in writing; your written work must be your own. You may not seek answers to assignment questions elsewhere. Attempting to solve a problem, whether you succeed or not, is a valuable learning experience which will give meaning and purpose to results you have learned, solidifying your understanding of the subject and helping you to think and question on your own.

Plagiarism and cheating: Tests are closed-book and must be entirely your own work. During the time-window of a test, you may not collaborate with classmates or seek help from anyone other than your instructor, and you may not consult any sources such as course material, textbooks, or websites. You will be asked to sign an honour pledge on each test paper to this effect. When writing assignments, you may consult course material, and you are allowed to discuss questions with classmates as outlined above. But soliciting outside help on assignment questions (for example, from a higher level student, from non-course websites, online chat or discussion forums, etc.) is considered cheating. Use of solutions to tests or assignments from a previous year to which you have somehow gained access is strictly forbidden and considered plagiarism. Copying solutions from textbooks or websites and presenting them as your own is plagiarism. Any student suspected of violating these rules will be required to pass an oral exam to demonstrate a full understanding of the work submitted. Further action may then be taken following Dalhousie's official plagiarism and cheating policy.

Submission policy: Each test and assignment must be completed *on the question sheet* and submitted on Brightspace by the due time. (Detailed submission guidelines can be found on Brightspace). Because solutions will be made available on the same day and assignment questions are frequently discussed in lectures, no late assignments will be accepted. Failure to submit a test or assignment will result in a score of 0 unless a *Student Declaration of Absence* is filed or there are extenuating circumstances.

Technical problems: Extra time has already been incorporated in the time-windows of tests, to allow for routine technical hassles involved with online submissions. Students who can demonstrate that major technical malfunctions or other circumstances beyond their control prevented their submission of a test will be extended a grace period or given a make-up paper at another time.

STUDENT DECLARATION OF ABSENCE: To receive accommodations for academic requirements missed because of an absence of three or fewer days, you must submit a *Student Declaration of Absence* form, adhering to these procedures and deadlines:

- (i) Notify your instructor by email before 10:35am on the day the test or assignment is due.
- (ii) If you will miss a test, include in your email a copy of your official Dalhousie class schedule; failure to do so may result in a score of 0.
- (iii) Complete and submit the *Student Declaration of Absence* form on Brightspace (in Assignments under Assessment in the MATH 4010 course space) no later than three calendar days after the last day of your self-declared absence. (e.g. If your last day of absence is Friday, you must submit the form by the end of the following Monday.)

Accommodations will then be made as follows. For an assignment, the score for that paper will be dropped from your course assessment. For a test, a make-up test will be scheduled for you at the earliest possible date based solely on the constraints of your official Dalhousie class schedule. Be advised that this might be as early as 8:35 am on the day after your self-declared absence. You may submit a maximum of two *Student Declaration of Absence* forms.

UNIVERSITY POLICIES AND STUDENT RESOURCES: Information on Dalhousie policies and student resources can be found under Syllabus in the Table of Contents of the MATH 4010 course space on Brightspace.