



Dalhousie University  
Department of Mathematics and Statistics

**MATH 3501**  
***Intermediate Analysis I***  
**Fall 2018**

**INSTRUCTOR:**

Andrea Fraser, Assoc. Professor  
Chase Building, Room 206 (by the central stairwell)

afraser@mathstat.dal.ca  
494-3062

**LECTURES:**

Monday, Wednesday, Friday: 11:35 am-12:25 pm, Chase Building 319

**COURSE DESCRIPTION:**

MATH 3501.03 continues the analysis sequence begun in MATH 2505.03. Topics include: Metric spaces, point-set topological notions, sequences, completeness, separability, compactness (Heine-Borel, Bolzano-Weierstrass, Finite Intersection, complete and totally bounded), limits and continuity, continuity in topological terms, connectedness, path- and local path-connectedness, homeomorphisms, uniform continuity, Lipschitz continuity, contractions, contraction principle, sequences of functions, uniform convergence. Further topics may include: Arzelà-Ascoli theorem, Stone-Weierstrass theorem.

**PREREQUISITES:** MATH 2135.03, MATH 2505.03

**EXCLUSIONS:** MATH 3500X/Y.06

**COURSE OBJECTIVES:**

This course covers the fundamental concepts and major results of metric space theory, which are needed for continuing in analysis and applied analysis. Students are expected to be already familiar with logical argument and mathematical formalism and will be further trained in mathematical enquiry, reasoning, and formulation of proofs.

**COURSE MATERIALS:**

No required text; course notes will be provided. Announcements and occasional material for this course will be offered on Brightspace.

**IMPORTANT DATES:**

TESTS in class: Wednesday Oct 10, Monday Nov 19

QUIZZES in class: Fridays Sep 14, Sep 28, Oct 19, Nov 2, and Tuesday Dec 4

ASSIGNMENTS due each Wednesday (except the weeks of the tests) and Tuesday Dec 4

**COURSE ASSESSMENT:**

Tests: 60%

Quizzes: 15%

Assignments: 25%

**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:**

Attendance is expected in this course. Class discussions are an integral part of the learning process, and all students are expected to participate. All course content will be covered in lectures and in handouts distributed in class. All handouts for this course will be available in class, at the start of lecture on the day on which they are first distributed. If you are unable to attend a lecture, it is your responsibility to obtain a copy of the lecture notes or any distributed handouts from a fellow student who was present.

Lecture notes will not be posted or distributed. Taking notes during lectures is an important skill which you are expected to practice in this class. If you find it difficult to keep up, try to improve your note-taking speed. Learn to write using abbreviations, a personal shorthand, or to write while watching the board rather than your page. You might find it helpful to review your notes as soon as possible after class. This is also a good time to tidy up your notes, fill in any things you did not record, memorize new concepts, and try the exercises given in class. Be sure to seek help from your instructor (in class, by email, or by setting up a time to meet) if there are things you don't understand.

Any announcements regarding the course will be made in class, on Brightspace, or by email. You are expected to attend class and to check Brightspace and email regularly. If you miss or are late for a class, it is your responsibility to consult your peers to learn of any announcements. If you do not use your official Dalhousie email address, you should set a forward on it to an address you do use.

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.

Soliciting outside help on assignment questions (for example, at the Learning Centre, from a higher level student, or online) is considered cheating. Use of solutions to tests or assignments from a previous year to which you have somehow gained access, and use of information from websites in solving assignments, are strictly forbidden and considered 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.

Each assignment must be completed *on the question sheet* and submitted *in class* at the *start* of lecture on the day it is due (or in the event of university closure, on the next class day the university is open). Assignments left at the instructor's office during the lecture will not be accepted. Because assignment solutions will be made available on the same day and assignment questions are frequently discussed in class, no late assignments will be accepted. This includes assignments received on the due date at any time *after* class has started or solutions have been distributed. There will be no make-up assignments under any circumstances.

Quizzes and tests will be held in class on the dates listed (or in the event of university closure, on the next class day the university is open). Because solutions will be made available on the same day, absence for quizzes or tests will result in a score of 0 unless a *Student Declaration of Absence* is filed.

**STUDENT DECLARATION OF ABSENCE:** To self-declare your absence for a quiz, test, or assignment, you must notify your instructor by email *before* 11:35 am on the day the quiz or test is to be written, or the assignment submitted. In the case of a test, you *must* also include in your email a copy of your official Dalhousie class schedule; failure to do so may result in a score of 0. The *Student Declaration of Absence* form (which can be found in Assignments under Assessment in the MATH 3501 course space on Brightspace) must be completed and submitted via Brightspace *no later than* three days after your last day of self-declared absence.

If you self-declare absence from class on the day an assignment is due, you may submit your assignment electronically (scanned and emailed), but it must be received before 11:35am. You may opt instead not to submit your assignment, in which case the score for that assignment will be dropped from your course assessment. If you self-declare absence from a quiz, the score for that quiz will be dropped from your course assessment. If you self-declare absence from 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 last day of self-declared absence.

## **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 3501 course space on Brightspace.