

Faculty of Science Course Syllabus
Department of Mathematics & Statistics
MATH 3501: Intermediate Analysis I
Fall 2021

Instructor: Karl Dilcher *karl.dilcher@dal.ca*

Lectures: M-W-F, 11:35-12:25. (First class, Wed., Sept. 8).

Office hours: 3 hours per week; time and venue to be announced.

Course delivery:

- Depends on developments in the public health situation and in university regulations.
- Likely to start online, and switch to in-person later if and when circumstances allow.
- If online, classes will be *synchronous*, at the advertised lecture hours, and delivered through Collaborate Ultra within the BrightSpace page for this course.
- The delivery mode of the first class will be announced on the BrightSpace page **and** by e-mail to everybody by Tuesday morning, Sept. 7, at the latest.

Course Description (from calendar):

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: Arzela-Ascoli theorem, Stone-Weierstrass theorem.

Course Prerequisites

(MATH 2040 or MATH 2135.03) and MATH 2505.03

Course Exclusion

MATH 3500.06

Learning Objectives

Students will gain a solid understanding of the concepts of analysis as listed in the course description. In particular, this course serves as an important prerequisite to MATH 3502 and to 4th year and/or graduate courses in analysis and topology.

Course Materials

- Complete course notes will be made available electronically and free of charge through the BrightSpace page for this course.
- Additional materials (such as practice problems) will also be made available, as required.

Course Assessment

Component	Weight (% of final grade)	Date
<i>Assignments</i>	30 %	Weekly (except around midterm)
<i>Midterm test</i>	30 %	TBA (in consultation with class), 60 minutes, during class time.
<i>Final exam</i>	40 %	During exam period, 3 hours.

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

Course Policies on Missed or Late Academic Requirements

- *Missed midterm or final exam:* Make-up exams will be offered; SDA forms required.
- *Assignments:* The lowest one (including any missed assignment) will not count. Further information, including policies on collaboration, can be found in a detailed set of guidelines posted on Brightspace along with the first assignment

Course Content

The exact schedule will remain flexible. The main topics covered are:

- Euclidean Space
- Topological Concepts
- Compact and Connected Sets
- Continuous Mappings
- Function Spaces