

**MATH 464**  
Real Analysis  
*Fall 2022*

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**Office Hours:** \_\_\_\_\_

**Required Textbook:** *Real Analysis*, 2nd, 3rd or 4th Edition, by H. L. Royden (MacMillan ed.)  
The textbook is a classical analysis textbook but the contents of the course are highly standardized and can be found in several books of advanced undergraduate level.

Purchase of the book is not required; it can be considered reference for the material covered in class.

**Topics:** The following topics will be covered, as time permits:

- Review: sets, functions, relations, countable sets.
- Incompleteness of the rationals, construction of the real numbers.
- Topology and properties of the real numbers.
- Metric spaces, normed linear spaces, point set topology.
- Compactness, Heine-Borel theorem, Bolzano-Weierstrass property.
- Continuous functions, connectedness, intermediate value theorem.
- Function spaces, uniform convergence, Arzela-Ascoli theorem.
- Approximation, Stone-Weierstrass theorem.
- Fixed point theorems and applications.

There will be complimentary topics as well, depending on time. Assignments will be given and are integral part of the final grade.

**Calculators:** Only calculators approved by the Department (with a sticker attached as proof of approval) are permitted for the class test and final examination. For a list of Approved calculators see <http://www.concordia.ca/artsci/math-stats/services.html#calculators>.

**Term Exams:** There will be a test in week 6 or 7. There will be no make-up midterm exam.

**Grading:** Midterm Exam 25%, Assignments 20%, Final 55% or  
Assignments 20%, Final 80%, (whichever is most favorable).

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.

### **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.

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.

### **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.

### **Intellectual Property**

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