MATH 2080 Introduction to Analysis 2025F

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Text: Understanding Analysis, 2nd Edition, by Stephen Abbott
        (An e-version of the text is accessible on the UM library web)

Class schedule: MWF 10:30-11:20 am, EITC E2 330

Lab schedule: Thu 4:00-4:50 pm for both B01 and B02

Course content: The course covers the following topics in the textbook.

Chapter	Topic	Suggested homework
1.The Real Numberrs	The irrationality of $\sqrt{2}$ **N, Z, Q,** and **R** Completeness Set operations Cardinality	Sec 1.2: 1, 2, 7-10,1 2, 13 Sec 1.3: 1-9 Sec 1.4: 1-5 Sec 1.5: 1-6
2. Sequences and Series	Sequence convergence Proof of a limit Monotone convergence the Cauchy Criterion The B-W Theorem, AoC and MCT Series Positive series, absolute convergence Geometric series, alternating series Conditional convergence Rearrangement*	2.2.2-2.2.7 2.3.1-2.3.10, 2.3.11*, 2.3.12 2.4.1-2.4.3, 2.4.5, 2.4.6*, 2.4.7, 2.4.8, 2.4.9* 2.5.1-2.5.3, 2.5.5, 2.5.6*, 2.5.7 2.6.2-2.6.4 2.7.2, 2.7.4, 2.7.7-2.7.9, (2.7.12-2.7.14)*
3. Basic Topology of **R**	Cantor set* Open sets, closed sets Limit points, isolated points, interior points Closure and completeness Compact sets* Connected sets*	3.2.1-3.2.11 3.3.1-3.3.6, 3.3.8
4. Functional Limits and Continuity	Functional limits, ε-δ and V_ε-V_δ arguments Continuity, composite continuity On compact sets* Min-Max theorem Uniform continuity The Intermediate Value Theorem	4.2.5-4.2.9, 4.2.11 4.3.1, 4.3.3-4.3.6, 4.3.8-4.3.10 4.4.1, 4.4.2(a)(b), 4.4.3, 4.4.4(a). 4.4.5-4.4.8, 4.4.10, 4.4.11
6.1-6.2 (If time permits) Function Series	Power series Uniform convergence	6.2.1, 6.2.6, 6.4.4, 6.4.5(a)

Grading: 4 quizzes (given in labs)   16%   (4% for each)
                    4 assignments (given on UM Learn, hand in in labs) 32%   (8% for each)
                    Final exam (to be scheduled by RO)   52%

Conversion of minimum numerical percentage to letter grades:

A+ 92, A 85, B+ 78, B 70, C+ 65, C 60, D 50, F <50

Tentative **dates for quizzes are Sept 18, Oct 9, Oct. 30, and Nov. 20. Dates for assignments to be handed out and handed in will be announced on the UM Learn course web.**
In this course, we will mainly study proofs rather than computations. If you are not ready to learn rigorous mathematical proofs, you should avoid this course. Students are expected to attend all lectures and all labs, though attendance will not be recorded. Quizzes will be given in labs. **All quiz results count. No makeup quizzes will be offered.** Missed quizzes will be assigned 0 marks unless acceptable reasons are provided. In the latter case, the weight of the potion will be transferred to the student's final exam. The textbook contains many exercise questions. I have chosen some of them in the course content table above for you to practice. You should attempt as many exercise questions as you can. Quizzes and assignments are graded by your lab TA.

Important dates

Sept. 3:	First class
Sept. 13:	Last day to drop
Nov. 10-14:	Fall term break
Nov. 18:	VW deadline
Dec.8:	Last day of class

Holydays

Sept. 30:	Orange Shirt Day
Oct. 13:	Thanksgiving Day
Nov. 11:	Remembrance Day
Dec. 24-Jan 2:	Winter Holiday

Academic Integrity

The Department of Mathematics, the Faculty of Science and the University of Manitoba all regard acts of academic dishonesty in quizzes, tests, examinations or assignments as serious offences and may assess a variety of penalties depending on the nature of the offence.Acts of academic dishonesty include bringing unauthorized materials into a test or exam, copying from another student, plagiarism and examination personation. Students are advised to read section 7 (Academic Integrity) and section 4.2.8 (Examinations: Personations) in the General Academic Regulations and Requirements of the current Undergraduate Calendar. Note, in particular, that cell phones and pagers are explicitly listed as unauthorized materials, and hence may not be present during tests or examinations.Penalties for violation include being assigned a grade of zero on a test or assignment, being assigned a grade of "F" in a course, compulsory withdrawal from a course or program, suspension from a course/program/faculty or even expulsion from the University. For specific details about the nature of penalties that may be assessed upon conviction of an act of academic dishonesty, students are referred to University Policy 1202 (Student Discipline Bylaw) and to the Department of Mathematics policy concerning minimum penalties for acts of academic dishonesty.All students are advised to familiarize themselves with the Student Discipline Bylaw, which is printed in its entirety in the Student Guide, and is also available on-line or through the Office of the University Secretary. Minimum penalties assessed by the Department of Mathematics for acts of academic dishonesty are available on the Department of Mathematics web-page.