

The University of Western Ontario
Department of Mathematics
Mathematics 2122B, Winter 2023
REAL ANALYSIS I
Course Outline

Lectures: Tue 1:30–3:30pm, Thu 1:30–2:30pm, WSC 240

Tutorials: Thu 2:30–3:30pm, WSC 240

Instructor: Dr. Janusz Adamus

Office: MC 122

E-mail: jadamus@uwo.ca

Office Hours: Mon 9:30am–12:00pm, Tue 9:30–10:30am, in-person, MC 122

Teaching Assistant: TBA

Course Website: <http://uwo.ca/math/faculty/adamus/teaching/2122B2023/>

Students are responsible for checking the course website on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

Textbook: The course will be based largely, but not exclusively, on the following required book:

Real Analysis, Foundations and Functions of One Variable by Laczkovich and Sos, publ. Springer.

Available free online from Western Libraries at

https://ocul-uwo.primo.exlibrisgroup.com/permalink/010CUL_UW0/r0c2m8/alma991044362118605163

Prerequisites: A minimum mark of 60% in one of Calculus 1501A/B, or Numerical and Mathematical Methods 1414A/B (the former Applied Mathematics 1414A/B, or the former Applied Mathematics 1413), or a minimum mark of 85% in Calculus 1301A/B. Integrated Science 1001X with a minimum mark of 60% can be used in place of Calculus 1301A/B.

Senate Policy on Prerequisites: Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Tutorials: There will be weekly tutorials in which problems will be worked out, and where students will be able to ask questions and get more insights on topics covered in class.

Course Outline: A rigorous introduction to analysis on the real line. Sets and functions, logic and mathematical proof, the natural and real numbers, completeness and its consequences, limits of sequences, limits of real functions, continuity and uniform continuity.

Evaluation: The course mark will be based on 6 bi-weekly written assignments, 2 midterm exams (approx. 100 min. each) held in class, and the final exam, with the following weights:

- Written assignments: 24%
- Midterm exams: 36% (18% each)
- Final exam: 40%.

Examination Dates: The tentative deadlines of written assignments are Jan.21, Feb.4, Feb.27, Mar.13, Mar.27, and Apr.10. The midterm exams will be held on **Thursday, Feb.9** and **Thursday, Mar.16**, 2023. Final exam TBA by the Registrar.

Contingency plan for an in-person class pivoting to online learning: In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on the course website for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor.

What is Expected of the Student: The goal of the Real Analysis stream (Math 2122 and Math 3122) is for the students to achieve a good understanding of the fundamental concepts and methods of mathematical analysis, as well as a facility in reading, understanding and writing proofs. Class (and tutorial) attendance is required, class participation is expected. The latter includes both asking questions and responding to instructor's questions. Preparation for each class will involve reading one's class notes and the textbook. The students are expected to complete all the assigned homework problems.

Students that work at a consistent pace throughout the term (and do not put off asking questions until exam time), use help resources available (e.g., tutorials, office hours), and do self-directed exploration of topics, tend to achieve better results in university-level mathematics courses.

Student Absences: If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Written assignments: If academic accommodation for an assignment is granted by a student's faculty counsellor, then that student's mark for that assignment will be replaced by the average mark of the student's other assignments. There will be no make-ups of missed assignments.

Assessments worth 10% or more of the overall course grade: For work totaling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Students meeting the above requirements for a missed midterm exam, will be required to write a make-up exam. The make-up exams are tentatively scheduled for Feb.17 and Mar.24, respectively.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.

Absences from Final Examination: If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

Religious Accommodation: When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Accommodation Policies: Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf

Academic Policies: The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

No electronic devices will be permitted on tests and exams.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

In the event of a health lock-down, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide personal information (including some biometric data) and the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

Support Services: Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Students who are in emotional/mental distress should refer to Mental Health@Western

(<http://www.health.uwo.ca/mentalhealth>) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.