

MATH 4200 Course Outline

Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via Courselink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

COVID-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces>

Please note, that these guidelines may be updated as required in response to evolving University, Public Health or government directives.

General Information

Course Title: Advanced Analysis

Course Description: This senior course in analysis will cover basic operator theory on Hilbert spaces, including self-adjoint operators and the spectral theorem. Other topics may include weak solutions, Sobolev spaces, inverse problems, measure theoretic probability or advanced topics from linear or nonlinear functional analysis.

Credit Weight: 0.5

Academic Department (or campus): Mathematics & Statistics

Campus: University of Guelph

Semester Offering: Winter 2022

Class Schedule and Location: MWF 2:30-3:30 in MacKinnon 230 (section 01)
Virtual (section 02)

(N.B. for at least the first two weeks of the semester, all classes are online. Zoom link to be posted on courselink.)

Instructor Information

Instructor Name: Rajesh Pereira

Instructor Email: pereirar@uoguelph.ca

Office location and office hours: MacN 519, Office Hrs TBA

Course Content

Specific Learning Outcomes: Students in this course will learn the basic ideas and tools of analysis. Students will learn how to construct proofs and write mathematical arguments.

Lecture Content: Measure Theory and the Lebesgue Integral. Hilbert Spaces, Self-Adjoint Operators, Operator Theory and the Spectral Theorem.

Course Assignments and Take-home final: There will be six assignments. Approximate and tentative due dates are January 26th, February 4th, February 14th, March 2nd, March 11th, March 21st. Take-home final be tentatively due April 20th.

Course Resources

Required Text: Real and Functional Analysis by Vladimir I. Bogachev and Oleg G. Smolyanov. Springer 2020

This text is available online from the University of Guelph Library rather than at the bookstore. It is part of the Moscow Lecture Series published by Springer.

Course Policies

Grading Policies: Assignments: 60%, Take-Home Final 40%

Course Policy on Group Work: While you may consult with one another or any reference about the general ideas on assignments, any written work must be your own. It is not permitted to ask someone for step-by-step guidance on assignment problem nor to copy from the work of another student or any other source.

Email Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Undergraduate Calendar for information on regulations and procedures for [Academic Consideration](#).

Drop Date

Courses that are one semester long must be dropped by the end of the last day of classes; two-semester courses must be dropped by the last day of classes in the second semester. The regulations and procedures for [Dropping Courses](#) are available in the Undergraduate Calendar.

Copies of Out-Of-Class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

More information: www.uoguelph.ca/sas

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The [Academic Misconduct Policy](#) is outlined in the Undergraduate Calendar.

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The [Academic Calendars](#) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.