

Applied Mathematics 4999z Course Outline 2022-23

Revised September 2, 2022

1. Course Information

[Applied-Math Project, APPLMATH 4999z, FW 2022-23](#)

Times: A poll will determine a suitable weekly meeting time for all those enrolled in this course.

This course will be delivered in person. Please note that this is a **full-year half-credit** course.

Regular meetings with a faculty mentor will be arranged by the student. These should happen at least once every other week when classes are in session.

List of Prerequisites

Registration in the fourth year of a program in Applied Mathematics.

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 if you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Greg Reid, Professor (Course Coordinator)	reid@uwo.ca	MC 281	ext 88793	Wed: 2:30 – 3:30 pm or by appointment

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

Please use “4999z” (exactly as typed) in the subject line of your email.

3. Course Syllabus, Schedule, Delivery Mode

From the calendar: *The student will work on a project under faculty supervision. The project may involve an extension, or more detailed coverage, of material presented in other courses. Credit for the course will involve a written as well as oral presentation.*

It is your responsibility to find a supervisor. This is a condition for enrolment in the course.

This course will be **delivered in person**. It serves as a capstone experience for students in the Applied Mathematics undergraduate program. By the end of the course the student will have achieved competencies related to conducting research in an area of applied math. Specifically, the student will be able to:

- carry out an effective search of the peer-reviewed literature relevant to a given topic;
- summarize and evaluate peer-reviewed literature relevant to a given topic;
- apply new and existing mathematical knowledge to answer a non-trivial question in the natural sciences, social sciences, computational sciences, or related area;
- discuss findings giving consideration to the peer-reviewed literature relevant to a given topic, and giving consideration to the limitations of the mathematics that have been applied;
- communicate effectively in both written and oral forms;
- conduct themselves in a manner that is consistent with Scientific Professionalism and demonstrate an ability to engage with a community of professionals in a similar way.

Contingency plan for an in-person class pivoting to 100% 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 OWL 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.

In the (hopefully unlikely) event that the instructor cannot access campus (e.g., because of a failed COVID-19 screen), classes will temporarily move to an online synchronous mode of delivery. In this case, online classes will be recorded, and videos will be posted on OWL.

4. Course Materials

Materials required for this course will vary. Check with your faculty mentor directly. If you need access to computational resources but are unsure how to access them, please feel free to approach the Course Coordinator with a request.

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) 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.

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

Evaluation in APPLMATH 4999z will be conducted in collaboration with faculty mentors.

Important dates:

Before September 1: Contact the coordinator (Greg) and have initial meeting with him (Zoom is OK). By September 1 if possible.

By September 15: Finalize a faculty mentor (both of you should agree in principle to the supervision).

A necessary requirement of this course is to have a faculty mentor (and these are limited). So it is important that you begin the process of finding a faculty mentor asap.

Assessment will reflect the goals of the course and include:

Practise Mini Project	10 points	(October 9 by 11:55pm)
Literature Search & Review, Critical Evaluation and Proposal	10 points	(October 30 by 11:55pm)
Peer Input on Proposal	05 points	(November 6 by 11:55pm)
Midterm Status Report	05 points	(December 7 by 11:55pm)
Final Oral Presentation	15 points	(March, in class)
Final Essay	40 points	(April 1 by 11:55pm)
Participation	15 points	

To receive a grade in APPLMATH 4999z

- the student will be expected to participate in no less than 3/4 of the scheduled weekly classes;
- receive at least a passing grade on the essay portion of the course (i.e., no less than 20 out 40).

All evaluations will involve faculty mentors to varying degrees.

All written assignments must be prepared using the LaTeX typesetting language. Please know that the coordinator may request original .tex files for evaluation.

Practise Mini Project

This is a mini project, to give students an introduction and over-view to expectations of the course. It will be on a designated topic and will enable the students to get feed-back and motivation for later aspects of the course: literature search and review, introduction for a general audience appropriate presentation of results and discussion of future work.

Literature Search

Use tools suggested by UWO Library representatives to identify 10 - 20 key references related to your project. Describe your search procedures (databases used, search terms employed, criteria for inclusion/exclusion) and create a bibtex file to (begin to) serve you as a resource this term.

Literature Review

1000-word essay that addresses the following points:

- What topic are you studying? Generally speaking, why is your topic interesting?
- Based on your literature search, what is the current state of knowledge related to your topic? What gap(s) in understanding exist?
- What gap in understanding will you work toward addressing? Why is it important to do so?
- How do you propose to go about addressing said gap? What milestones will you work toward?

Peer Input on Proposal

You will be assigned a peer's proposal. You will read it over and ultimately

- provide a brief summary of the proposal (about one paragraph),
- clearly identify at least three strengths and at least three opportunities for improvement,
- provide concrete suggestions for capitalizing on opportunities for improvement.

Midterm Status Report

A written document that reminds the reader about your topic and your question/goal. A bulleted list describing milestones achieved to date. A second bulleted list describing a timeline for project completion in Winter term.

Final Oral Presentation

Classes in March will be devoted to student presentations. Sign up will be available through OWL.

Final Essay

The final essay will represent the full report of the scientific activities undertaken by the student during FW 2021-22. It should be written assuming the reader is mathematically savvy but has no prior knowledge of the area of application. Results should be presented clearly and discussed thoroughly in the context of the relevant literature. Citations should follow the tradition of the area of application. In keeping with university academic policy, essays should be at least 2500 words (not including abstract, not including captions associated figures and/tables where applicable, and not including citations).

Participation

The coordinator will award 10 of the 15 points available for participation based on attendance and engagement. The remaining 5 will be awarded by mentors, based on the student's participation in their regular meetings.

Accommodated Evaluations

Except for the "Literature Review" (due October 26, and subject to subsequent peer evaluation), excused absences can be accommodated by providing a student in need with a one-week grace period. After the one-week grace period expires (or in the absence of a grace period altogether), late penalties will be applied at a rate of 10% per day, holidays and weekends included.

The project-based nature of this course means that long-term and/or extended excused absences will have to be dealt with on a case-by-case basis.

6. Student Absences

Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- (ii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

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 must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

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

and for the Student Medical Certificate (SMC), see:

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

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>.

Absences from Final Examinations

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).

7. Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD), 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,

8. 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.

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.

All required papers will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

9. 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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and yearround through individual counselling.

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>.