

Applied Mathematics 4999Z Course Outline

1. Course Information

Course Information

Project, Applied Mathematics 4999Z, Fall 2024

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

List of Prerequisites

Registration in the fourth year of a module offered by the Department of Mathematics and permission of the department.

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Advisors) 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.

2. Instructor Information

Instructors	Email@uwo.ca	Office	Phone	Office Hours
Prof. Matthias Franz	mfranz	MC 103D	86538	TBA

Students must use their Western (@uwo.ca) email addresses when contacting their instructor. The course number (AM 4999Z) must be included in the subject line. The email must adhere to professional standards (proper salutation, complete sentences, correct English etc.).

Office hours will be held in person.

3. Course Syllabus, Schedule, Delivery Mode

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.

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.

Class meetings are in person.

Classes begin: September 5, 2024; January 6, 2025

Fall Reading Week: October 12 – 20

Spring Reading Week: February 17 – 21, 2025

Classes end: December 6, 2024; April 4, 2025

Exam period: December 9 – 22, 2024; April 7 – 30, 2025

Contingency plan for an in-person class pivoting to 100% online learning: In the event of a health lockdown 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.

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.

All course material will be posted to OWL: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

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

Technical Requirements

In the event of a health lockdown you will need a stable internet connection, computer with working microphone and webcam.

5. Methods of Evaluation

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

Grading Scheme and Assessment Dates

The assessments will reflect the goals of the course:

Literature Search	05 points (October 3 by 11:55pm)
Literature Review, Critical Evaluation and Proposal	15 points (October 24 by 11:55pm)
Peer Input on Proposal	05 points (November 7 by 11:55pm)
Midterm Status Report	05 points (December 6 by 11:55pm)
Final Oral Presentation	15 points (March, in class)
Final Essay	40 points (April 4 by 11:55pm)
Participation	15 points

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.

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 your work address? Why is it important to do so?
- How do you propose to go about addressing said gap? Towards what milestones will you work?

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 the Winter term.

Final Oral Presentation

Classes in March will be devoted to student presentations. The precise date will be agreed upon with the course instructor.

Final Essay

The final essay will represent the full report of the scientific activities undertaken by the student during the academic year. It should be written with the assumption that 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.

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- Assessment "Literature Review" (Designated by the instructor as the one assessment that always requires documentation when requesting Academic Consideration)

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

Except for the "Literature Review" (due October 24, and subject to subsequent peer evaluation), excused absences can be accommodated by providing a student in need with a **4-day** grace period. After the 4-day grace period expires (or in the absence of a grace period altogether), late submissions will not be

accepted and the assessment receives 0 points. 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.

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

Essential Learning Requirements

Even when Academic Considerations are granted for missed coursework, the following are deemed essential to earn a passing grade:

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

If these conditions are not met, a student will receive a final grade of at most 49%.

6. Additional Statements

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

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 Registrar Services is <https://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 their official university address is attended to in a timely manner.

Electronic devices are not permitted during 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:

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

Support Services

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

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

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

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