

Math 4123A/9023A Fall 2025 Course Outline

1. Course Information

Course Information

- *Course Name:* Mathematics 4123A/9023A (RINGS AND MODULES)
- *Academic Term:* Fall 2025 (FW25)

List of Prerequisites

Math 3020A/B.

Unless you have either the prerequisites for this course or written special permission from the Department of Mathematics to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

2. Instructor Information

Instructor	Email	Office	Phone	Office Hours
Nicole Lemire	nlemire@uwo.ca	Redacted		TBA

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

3. Course Syllabus, Schedule, Delivery Mode

Course Syllabus:

As time permits, the main topics will include:

Rings:

- Fractions and Localizations
- Chinese Remainder Theorem
- Unique Factorization Domains
- Euclidean Domains
- Principal Ideal Domains
- Algebraic Integers
- Polynomials and Formal Power Series
- Factorization in Polynomial Rings

Modules:

- Generation of Modules, Direct Products and Sums, Free Modules
- Tensor Products
- Exact Sequences
- Injective and Projective Modules
- Zorn's Lemma
- Chain Conditions
- Modules over PIDs

Course-level learning outcomes:

- Students will be able to identify, formulate and solve problems about rings and modules, including proof writing.
- Students will be able to present mathematical information, including proofs, in correct mathematical English.
- Students will be able to present and explain their solutions to problems in an organized manner to the class.
- In particular, students will demonstrate these competencies in each of the main topics presented in the course syllabus.

Lecture Style and Delivery Mode:

Classes will be in person and we will follow Chapters 7-10 and 12 of the recommended textbook. Students will prepare for class by reading suggested material. In class, we will discuss the definitions, results and proofs and work through examples and exercises. Class attendance and participation will be required.

What is Expected of Students:

Students will be expected to attend all classes and to prepare for class by reading the textbook and course notes. During class, it will be expected that students regularly answer questions and participate in class discussion. Students are expected to do all of the assigned work. It is up to the student to seek

out help when needed. Students are expected to keep up with the material of the course by reading and learning definitions, theorems and results and by doing additional practice problems. They should review all learning materials in a timely manner, follow class announcements, complete all assignments, and write all examinations. Solutions of collected homework problems must be written neatly and submitted using Gradescope.ca. A fundamental component of the course is to **prove** mathematical theorems.

Key Sessional Dates:

Classes begin:	September 4, 2025
Last Day to drop a course without showing WDN:	September 12, 2025
National Day for Truth and Reconciliation:	September 30, 2025
Fall Reading Week:	November 3 – 9, 2025
Last Day to drop a course without academic penalty:	December 1, 2025
Classes end:	December 9, 2025
Study Day:	December 10, 2025
Exam period:	December 11 – 22, 2025

4. Course Materials

Textbook:

There is no required text.

Although we will not follow it strictly, the recommended reference is Abstract Algebra, Third Edition, by David S. Dummit, and Richard M. Foote, published by John Wiley and Sons, Inc. The course material corresponds to material in Chapters 7-10 and 12 of the text.

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.

Other online platforms/apps used in the course:

Other than the OWL Brightspace website, discussed above, we will use the following website:

Gradescope.ca: To upload written assignments and to access the graded midterm

Technical Requirements

In addition to pencil, paper and eraser, you need to have access to:

- Computer or laptop able to run a recent version of web browser such as Chrome, Safari or Firefox.
- Stable high-speed internet connection.
- Document scanner device or app.

Further Course Policies

- All in-person or online interactions with peers, as well as communication with TAs or Professors for this course should be conducted in a professional and respectful manner. Failure to do so will result in academic discipline.
- Recording lectures without the explicit consent of the Professor or TA is grounds for academic discipline.
- Course content created by a faculty member is considered the faculty member's intellectual property; it should not be distributed, shared in any public domain, or sold by a student or other third party without prior written consent of the faculty member.

5. Methods of Evaluation

Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Assignments:	20%
Participation:	10%
Midterm Test:	30%
Final Exam:	40%

Assignments:

There will be 5 assignments with tentative due dates:

- September 19
- October 3
- October 17
- November 21
- December 5

Each assignment will be due at **11:55pm EDT**. These are tentative due dates. Any changes to these due dates will be announced on OWL.

Participation: Students will be expected to attend and participate in class. The participation grade will be based on responses to questions asked in class, and presentations of solutions to assignment problems.

Midterm Test

The midterm test will contain problems from the course content covered in the first seven weeks of the term. The tentative date for the midterm will be:

Wednesday, October 29, 4:30-7:30pm.

There will be a makeup midterm exam for those who have been granted Academic Considerations for the midterm exam. The tentative date for the makeup midterm will be:

Wednesday, November 12, 4:30-7:30pm.

Note that the date and time of the midterm and the makeup midterm will be finalized after they are reviewed by Exam Central. Both the midterm and the makeup midterm will be in-person exams which will take place on campus. The locations of the exams will be posted closer to the dates of these exams.

Final Exam

The final exam will cover all the course material with more focus on the last part of the course. It will be a three-hour long exam and will take place in-person during the final exam period: December 11-22, 2025. It will be scheduled by the Registrar's office.

Use of Generative AI Tools

The use of Generative AI tools (e.g. ChatGPT, Copilot, Gemini) in this course are **prohibited**.

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:

- **Final Exam** (Defined by policy)
- **Midterm** (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

Assignments:

It will not be necessary to request Academic Consideration for assignments. The lowest assignment grade will be dropped. For the remaining assignments, any grade that is less than the student's final exam grade will be replaced by the final exam grade. This includes any number of missed assignments. In other words, missed assignments and assignments with grades lower than the final exam will be reweighted to the final exam. Do not request Academic Consideration for missed assignments and do not inform your professor about missed assignments, as these adjustments will be done automatically.

Note: This means that there will be no reason to request an Academic Consideration without supporting documentation in this course. The midterm and final exam are ineligible and no Academic Considerations are required for assignments.

See also the **Coursework with Assessment Flexibility section** below for the 48 hour No-Late-Penalty Period for assignments, which allows you to hand in any assignment up to 48 hours late.

Midterm:

If you miss the midterm due to any circumstance, you must provide an academic consideration covering the date of the test. A makeup midterm will be available to those who are granted an academic consideration in the week following the midterm exam.

In cases where a student misses the midterm exam and the makeup midterm exam and can provide an academic consideration for both absences, the weight of the midterm will be transferred to the final exam.

Final Exam:

When a student misses the Final Exam, they are expected to contact the Academic Counselling office of their Faculty of Registration as soon as they can do so. The Academic Counselling office will assess the eligibility of the student to be granted an Academic Consideration. If an Academic Consideration has been granted, the student will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam).

If a student misses the Final Exam and the Special Examination and has been granted Academic Consideration for both exams, the date of the next Special Examination (if another Academic Consideration is granted) normally will be the scheduled date for the final exam the next time this course

is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred.

See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

Coursework with Assessment Flexibility

By policy, instructors may deny Academic Consideration requests for the following assessments with built-in flexibility:

Flexible Completion:

Assignments: This course has 5 Assignments, and the 4 assignments with the highest marks are counted towards your final grade. Should extenuating circumstances arise, students do not need to request Academic Consideration for the first missed assignment. Academic consideration requests will be denied for the first missed assignment. It will not be necessary to request Academic Considerations for any additional missed assignments. These additional missed assignments will be automatically transferred to the final exam.

Deadline with a No-Late-Penalty Period

Assignments. Students are expected to submit each of the 5 assignments by the deadline listed. Should extenuating circumstances arise, students do not need to request Academic Consideration and they are permitted to submit their assignment up to 48 hours past the deadline without a late penalty. After the No-Late-Penalty period, assignments will not be accepted and will be considered to be missed. As already stated, there is no reason to request Academic Considerations. If a student has missed more than 1 assignment, and has failed to submit any subsequent assignment by the end of the No-Late-Penalty Period, the weight of that missed assignment will be automatically transferred to the final exam.

6. Additional Statements

6.1 Religious Accommodation

When conflicts arise 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 of 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>

6.2 Academic 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.

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: 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 email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

Procedures on Request for Relief from Academic Decision (Graduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/graduate_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences: https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences:

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

Only in the event of a university-declared emergency requiring some or all of the course to be delivered online: the 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>.

6.5 Support Services

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

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.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

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. If you have any questions regarding accommodations, you may also wish to contact Accessible Education at

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

Learning-skills counsellors at Learning Development and Success (<https://learning.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 year-round through individual counselling.

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/>.

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