Department of Mathematics



Go

Math 4120B/9020B: Field Theory, Winter 2023

(Course outline version: January 1, 2023; may be updated later.)

1. Course Information

Course Name: Field Theory

Course Number: Math 4120B/9020B

Academic Term: FW22

Lecture Information: MWF 10:30-11:30am, MC 108.

Prerequisites: Mathematics 3020A/B and Math 3120A/B or equivalent.

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.

2. Instructor Information

Instructor: Nicole Lemire

Email: nlemire at uwo dot ca

Office: MC 103C.

Office hours: after class or by appointment.

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

3. Course Syllabus, Schedule, Delivery Mode

Course Description:

Rings: fractions and localization, Chinese Remainder Theorem, factorization in commutative rings, Euclidean algorithm, PIDs, algebraic integers, polynomials and formal power series, factorization in polynomial rings;

Modules: generation, direct products and sums, freeness, presentations, tensor algebras, exact sequences, projectivity, injectivity, Hom and duality, Zorn's Lemma, chain conditions, modules over PIDs.

Sessional Dates:

Classes begin: September 8, 2022; January 9, 2023

1/4/23, 3:28 PM Math 4120B/9020B: Field Theory, Winter 2023 - Department of Mathematics - Faculty of Science - Western University

Fall Reading Week: October 31 - November 6, 2022; February 18 - 26, 2023

Classes end: December 8, 2022; April 10, 2023

Exam period: December 10 - 22, 2022; April 13 - 30, 2023

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, affected 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

Textbook: *Abstract Algebra*, Third Edition, by David S. Dummit, and Richard M. Foote, published by John Wiley and Sons, Inc.

The course material corresponds to Chapters 13 and 14 of the text, plus some additional topics.

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

Technical Requirements: We will be using GradeScope for homework and exams. By taking this course, you are consenting to the use of this software. Completion of this course will require you to have a laptop or computer, a reliable internet connection, a working microphone, a working webcam, and a device for scanning (either a scanner or an app that can be used in conjunction with your device's camera).

5. Methods of Evaluation:

Evaluation of Student Performance (Math 4120B):

Final Exam: (40%) cumulative, to be scheduled by the Registrar's Office.

Midterm Exam: (35%) Tentative date: March 2nd, 7-9pm (To be confirmed).

Assignments : (25%) Due dates: January 20, February 3, February 17, March 17, March 31

(Any updates will be posted on OWL).

Evaluation of Student Performance (Math 9020B):

Final Exam: (40%) cumulative, to be scheduled by the Registrar's Office.

Midterm Exam: (30%) Tentative date: March 2nd, 7-9pm (To be confirmed).

Assignments : (20%) Due dates: January 20, February 3, February 17, March 17, March 31

(Any updates will be posted on OWL).

Project: (10%). Details will be available on OWL.

Note: The makeup midterm (if needed) will be tentatively scheduled on November 15, 7-9pm.

Expectations:

Attendance: Our class is small and someone's absence can greatly impact the rest of the class. Therefore you are expected to attend class or to let me know in advance when you are unable to attend.

Homework: You should complete each assignment entirely *on your own* (as if it were an exam). Failure to do so may be regarded as a **Scholastic Offence**.

Scholastic offences include: Copying solutions from other students, online sources, textbooks, etc.; showing your work to other students; uploading questions or solutions to a web site; and accessing a web site used for providing solutions (even if you do not use any solutions on the site). The **penalty** for an academic offence involving a midterm or final will be a failing grade in the course. The **penalty** for each academic offence involving homework will be a grade of 0 on the homework set as well as a penalty of **negative 5%** on the overall course grade. In some cases, the penalty can include expulsion from the program. All academic offences are added to your student record.

6. Student Absences

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

Assessments worth less than 10% of the overall course grade:

Please contact your instructor as soon as possible to seek accommodation. If your accommodation is accepted, the first step would be to arrange a short term extension of at most one week. If the accommodation period is longer than a week and at most 2 assignments have been accommodated to date, the assignment will be dropped and the remaining assignments will be averaged to determine the assignment component of the grade. If the accommodation period is longer than a week and 2 or more assignments have been accommodated to date, the missing assignment will be transferred to the final exam component of the grade.

Assessments worth 10% or more of the overall course grade:

For work totalling 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

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).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if 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).

Accommodated Evaluations

Missing the midterm test, the final exam or the due date of a submitted homework assessment will result in a grade of zero unless appropriate permission is sought and granted. Missed assessments can only be excused through one of the mechanisms above. In all cases, students are required to contact their instructors within 24 hours of the end of the period covered. In the case of a missed midterm test, a makeup exam will be arranged one week after the original midterm exam. If a student misses the midterm test and the corresponding makeup test and has appropriate permission for both, then the final exam will be reweighted to include the weight of the missed term test.

6. Accommodation and Accessibility

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

1/4/23, 3:28 PM

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.

7. Academic Policies

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

No electronic devices will be allowed on tests or examinations. This includes cell phones and calculators.

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 lockdown, 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.

8. 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/.

1/4/23, 3:28 PM

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

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 <u>http://academicsupport.uwo.ca/accessible_education/index.html</u> if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (<u>https://learning.uwo.ca</u>) 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/.

© 1878 - 2023 Western University

<u>The Department of Mathematics</u> Middlesex College London, Ontario, Canada, N6A 5B7 Tel: 519.661.2111 ext. 88774 math-inquiry@uwo.ca (undergraduate), math-gradprogram@uwo.ca (grad) Privacy | Web Standards | Terms of Use | Accessibility

Key Topics:

Undergraduate

Graduate People Research Outreach Calendars About Us

Popular Resources:

Calculus 1000A/B online Office of the Registrar Academic Calendar Intranet Login

