

CARLETON UNIVERSITY
SCHOOL OF MATHEMATICS AND STATISTICS

MATH 2100 Algebra II Fall 2020 - Winter 2021

Preliminary COURSE OUTLINE, subject to change

Objectives of the course: this is a course in abstract algebra, with the focus on proofs. It includes advanced topics in Linear Algebra and an introduction to Algebraic Structures.

Course Instructor: Dr. Inna Bumagin

- **Email:** inna.bumagin AT carleton.ca
- **Office hours:** by appointment.

Lectures in the Fall term: Tuesday and Thursday 14:30 - 16:00, beginning on Thursday September 10.

Tutorials in the Fall term: Mondays 13:30-14:30, beginning on September 21. Lectures and tutorials end on December 10 (Thursday).

Lectures in the Winter term: Tuesday and Thursday 14:30 - 16:00, beginning on Thursday January 7.

Tutorials in the Fall term: Mondays 13:30-14:30. Lectures and tutorials end on April 8 (Thursday).

Both lectures and tutorials are mandatory.

Prerequisites: i) MATH 1102 with a grade of C+ or higher, or (MATH 2107 with a grade of B+ or higher and permission of the School); and ii) MATH 1800 with a grade of C+ or higher; or permission of the School.

Textbook:

- Algebra, by Michael Artin, 2nd edition.

Recommended Textbooks:

- Introduction to Algebra, by Kostrikin and Koblitz,
- Linear Algebra Done Right, by Axler,

Topics for the Fall term:

- Review: vector spaces, subspaces, linear transformations;
- Direct sum of vector spaces;
- Inner product spaces, geometry, orthogonality;
- Bilinear and quadratic forms;
- Linear operators on inner product spaces;
- Least Squares method.

Topics for the Winter term:

- Sets with algebraic operations;
- Introduction to Groups;
- Examples of groups, Cyclic groups and Groups of permutations;
- Lagrange's Theorem;
- Normal subgroups and Quotient groups;
- Introduction to Rings and Fields;
- Homomorphism theorems.

EVALUATION. Your final grade for the course will consist of

- (1) **Attendance and participation 30%**
- (2) **Homework assignments 30%**
- (3) **Mid-year Examination 15%**
- (4) **Final Examination 25%.**

Attendance will be taken in every class and every tutorial. There will also be **quizzes** several times a week. The class time sessions will be mostly dedicated to discussions related to the course material. Your **participation**, via asking or answering questions, or sharing your understanding, should show the effort you put into this course.

Note: you must obtain **at least 50% of total and at least 50% of the Attendance and participation mark** to pass the course.

There will be **weekly homework assignments, due before the tutorials**. In tutorials, on a regular basis, you will be asked to present your solutions.

You are welcome to collaborate with other students from class on the homework, but please indicate clearly the names of other students you collaborated with and **write your solutions separately**. Getting help from anyone who is not a participant in this class is strongly discouraged.

There will be **two hour open book Mid-year Examination** during the period of December 12-23, 2020.

Final Examination is a 3-hour open book exam scheduled by the University. The exam is taking place during the period of April 11-23, 2021.

In all of your solutions, including the final exam, the tests and the homework assignments, you should **give precise references to the relevant statements from the posted course notes**, including the statement number. Marks will be deducted if precise references are not given.

You will be asked to submit the following **hand written honor pledge** with **every assignment**, as well as with **your mid-year and final exam solutions**: *I have neither given nor received unauthorized assistance during the completion of this work.* Solutions submitted without the honor pledge will not be graded.

Academic Integrity. The University states unequivocally that it demands academic integrity from all its members. Academic dishonesty, in whatever form is ultimately destructive to the values of the University. Students who violate the principles of academic integrity through dishonest practices undermine the value of the Carleton degree. Dishonesty in scholarly activity cannot be tolerated. Any student who violates the standards of academic integrity will be subject to appropriate sanctions.

Academic Accommodation

Carleton University has suspended the need for a doctor's note or medical certificate until further notice when requesting academic accommodation related to COVID-19. Students should complete the self-declaration form available on the Registrar's Office website to request academic accommodation for missed course work including exams and assignments.

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www2.carleton.ca/equity/>

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www2.carleton.ca/equity/>

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/> You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www2.carleton.ca/equity/>