MATH2108 Abstract Algebra 1/ MATH3101 Algebraic Structures with Computer Applications Summer 2022

Instructor: Mathieu Lemire
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Lectures: On Mondays and Wednesdays from 18:35 to 19:55 in room 4499 Mackenzie Building.
The first class is on Monday May 9.

Tutorials: Tutorials are scheduled to be on Wednesdays from 17:35 to 18:25 in room C264 Loeb Building.
The first tutorial is on May 18th. The following table gives more details:

Section	Room	TA's name	TA's connect email
A	C264 Loeb Building	Giries (George) Ghafari	georgeghafari@cmail.carleton.ca

Office hours: I will be very happy to answer any questions after our classes. You can also contact me by email at mathieul@math.carleton.ca or on Discord Forum that will be created for the course. I would be very happy to help.

Textbook: The official textbook for our class is 'Elements of Abstract Algebra' by Linda Gilbert (8th edition). It will be used as a ressource and also for its list of problems. Assignments questions may not all be taken from that textbook. The textbook is available to buy online or at the bookstore at Carleton (to be confirmed).

Prerequisites: For MATH2108: MATH1102 or MATH2107 and MATH1800. For MATH3101: MATH1102 or MATH2107 and COMP1805/MATH1805 orMATH1800l.

Evaluation: Your final grade will be calculated as:

40% Assignments (roughly 1 per week) + 30% Tests (3 tests) + Final Examination 30%

Term Mark: There will be three tests during tutorials on **June 8th, July 13th and August 3rd .** **No make up, early or delayed tests will be given. The tests will each be 50 minutes long.**

Final exam: The final exam is a cumulative three hours closed book exam scheduled by the university. The exam period runs from August 19th to August 25th (including Saturdays). It is student's responsibility to be available at the time of the examination. Naturally, the final examination will take place online. Students who missed the final examination may be eligible for a deferred exam provided that they present a doctor note or another supporting document to the Registrars Office. It is the Registrars Office and not the instructor which take decision of granting a deferred examination. After the exam is written, students may see their final examination papers. This examination review is for educational purpose only and NOT for negotiation of the grade.

Calculators: Only non-programmable and non-graphical calculators are allowed for tests and the final exam.

Practice problems lists Practice problems lists will regularly be posted on cuLearn. These problems are not to be handed in and will not be graded. However, in order to succeed in the course, it is absolutely essential to practice on a regular basis. The practice questions will be taken from the textbook for the course.

Withdrawal: The last day for academic withdrawal is August 16th.

Students with Disabilities: Students with disabilities who require academic accommodations in this course are encouraged to contact the Paul Menton Centre for Students with Disabilities to complete the necessary Letters of Accommodation. After registering with the PMC, make an appointment to meet with me and discuss your needs in order to make the necessary arrangements as early in the term as possible. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Notes:

1. If you are in the impossibility of doing a test, please let me know as soon as possible by writing to me an email. The procedure during this different term is to first fill up the Student Declaration Form: https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf and then send it to me (the professor and only the professor) by email. In the declaration form, you must write the reasons of your absence. Due to the current situation, you do not need to obtain and send a medical note.

2. Problem lists, comments, solutions and other informations will regularly be posted on Brightspace. It is your responsibility to look on Brightspace to obtain these informations.

3. The best way to know where exactly we are in class is to come to class or to follow the order of topics found in the practice problems lists.

4. Coming to class is very important and I strongly encourage you to do so.

5. Pregnancy accommodation: 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 webpage.

6. 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 webpage.

Tentative Class schedule:

IMPORTANT: This schedule is just to give you an overview. Because of several factors, it is quite possible that the timing of topics will be changing as we go further into the course. Some topics may possibly be added and some may be removed. The practice problems lists that will be available on BrightSpace will give you the exact topics covered on each week.

May 9th to May 13th: Divisibility, Greatest Common Divisor, Euclidean Algorithm, Prime Numbers and Factorization

May 16th to May 20th: Modular Arithmetic, Congruence Classes, Chinese Remainder Theorems

May 23rd to May 27th: Theorems on Modular Arithmetic , Cryptography.

May 30th to June 3rd: Cryptography, Groups, Examples of Groups

June 6th to June 10th: Subgroups, Cosets of Subgroups

June 13th to June 17th: Lagrange's Theorem, Homophisms, Isomorphisms

July 4th to July 8th: Quotient Groups, Rings, Subrings

July 11th to July 15th: Integral Domains, Ring Homomorphisms, Ideals

July 18th to July 22nd : Polynomial Rings, Division Algorithm for Polynomials

July 25th to July 29th: Irreducible Polynomials, Polynomial Factorization

August 1st to August 5th: Fields and Finite Fields

August 8th to August 12th: Boolean Algebra*, Lattices*

August 15: Review