



Faculty of Science Course Syllabus

Department of Mathematics & Statistics

MATH 3032: Abstract Algebra II (Winter 2021)

Instructor: Theo Johnson-Freyd, theo.jf@dal.ca

Lectures: Tuesdays & Thursdays, 8:35am–9:55am AST. Zoom.

Office hours: TBA

Course website: <http://categorified.net/21Winter3032/>

As per the University code, email is an authorized means of communication for academic and administrative purposes within Dalhousie. The University will assign all students an official email address. This address will remain in effect while the student remains a student and for one academic term following a student's last registration. This is the only email address that will be used for communication with students regarding all academic and administrative matters. Any redirection of email will be at the student's own risk. Each student is expected to check her or his official email address frequently in order to stay current with Dalhousie communications.

Course Description

Rings, fields, integral domains, Fermat's theorem, Euler's theorem, ideals, quotient rings, prime and maximal ideals, factorization of polynomials, Gröbner bases, Unique Factorization Domains, Euclidean Domains and Gaussian integers, and applications as time allows.

Prerequisites

MATH 3031: Abstract Algebra I

Course materials

The main textbook for the class is **A First Course in Abstract Algebra** (seventh edition) by J. Fraleigh; the (online) eighth edition would also suffice. It is recommended but not required that students own a copy. Fraleigh's book is available from the [Dalhousie Bookstore](#). There are many excellent algebra textbooks available at bookstores and online. I particularly recommend **Algebra** by M. Artin and **Abstract Algebra** by D. Dummit and R. Foote, and these will occasionally be used as supplements.

Course Content

We will cover Chapters 4 ("Rings and Fields"), 5 ("Ideals and Factor Rings"), and 9 ("Factorization").

Course Delivery

Lectures will be given over Zoom on Tuesdays and Thursdays, 8:35am–9:55am AST. A Zoom link will be provided to registered students. **Attendance is requested but not required.** Live attendance at lectures will help you learn the material and will help me deliver better lectures, but videos and notes from every lecture will also be available on the [Lectures](#) page of the course website.

Videos of all lectures will be housed on an unlisted Youtube channel. An "unlisted" channel is available to anyone who has the URL, but will not show up on search engines or the Youtube homepage. I will only post video of the slides and of myself, but if you ask a question during lecture, your voice will be included in the video. I will stop recording at the end of each lecture to provide time for unrecorded questions, and during the lectures questions asked in chat will be read out loud but without your name attached.

Course Assessment

Students are required to attend a brief individual introductory online meeting with the instructor during the first week of the term. Scheduling information will be provided over email.

The course grade will be based on homework assignments and a final exam. The homework assignments will be posted weekly on the [Homework](#) page of the course website, and due one week later. Assignments should be submitted via email attachment to the instructor. **Your homework must be submitted as a single PDF. No other formats will be accepted.** I encourage you to work together to complete your homework assignments. [Studies have shown that social ties are a main predictor of success in STEM classes.](#) Although you are encouraged to work together, the homework you submit must be written by you individually. Work that is too similar to another student's will not be accepted. Late submissions will not be accepted and will result in a grade of 0 unless a prior arrangement was made. There will be some flexibility for late submissions resulting from technology malfunction.

The final exam will be an open-book take-home exam, similar in style and difficulty to the homework assignments. Written answers to the exam should be submitted in a single PDF attachment, just like the homework. Additionally, each student must meet individually with the instructor during the exam period (April 10-23) to discuss their solutions to the final exam. Unlike the homework, the final exam must be completed by the student working alone: you are welcome to consult the textbook and other pre-written materials, but you may not collaborate on the exam, and you may not post the questions to the many online message boards that offer mathematics help.

Component weighting

Homework: 70%.

Final exam: 30%.

Conversion of numerical grades to Final Letter Grades follows the [Dalhousie Common Grade Scale](#)

A+ (90-100)

A (85-89)

A- (80-84)

B+ (77-79)

B (73-76)

B- (70-72)

C+ (65-69)

C (60-64)

C- (55-59)

D (50-54)

F (<50)