

MATH 351, SPRING 2020
INTRO TO ABSTRACT ALGEBRA I

Instructor: Ian Coley, iacoley@math.rutgers.edu

TA: Louis Gaudet, louis.gaudet@rutgers.edu

Lecture meets: Section 01: TF 12:00p - 1:20p, ARC-205

Section 02: TF 10:20a - 11:40a, ARC-204

Workshop meets: Section 01: M 10:20a - 11:40a, ARC-205

Section 02: W 10:20a - 11:40a, ARC-108

Office hours: Instructor: M 3:00p - 4:00p, W 12:00p - 1:00p

F 9:00a - 10:00a in Hill 226

TA: M 8:50a - 10:10a in Hill 620

Website: Available on [Canvas](#).

Textbook: Hungerford, *Abstract Algebra: An Introduction* 3rd Edition. Either the physical or digital book may be used. Note that Hungerford has another book called *Algebra* which is a graduate text – don't confuse the two!

Schedule: We begin by discussing the integers \mathbb{Z} and modular arithmetic in $\mathbb{Z}/n\mathbb{Z}$. We then move to the definition of a ring and explore $\mathbb{F}[x]$ as an example. We look at the specific cases of $\mathbb{F} = \mathbb{Q}, \mathbb{R}, \mathbb{C}$ to finish that discussion. The general theory of rings concludes the first part of this course. Midterm 1 will follow on **Tuesday, 3 March in class**.

Following rings, we approach the theory of groups from the ground up. Starting from basic definitions and examples, we will describe symmetric, alternating, dihedral, and cyclic groups. We then move to abelian groups and more on the general theory thereof. The second midterm will (likely) be a take-home exam, should the course be online-only by Week 13. The exam will be provided online on **Tuesday, 14 April** and due by **Friday, 17 April**. Students must complete the midterm on their own, without working with classmates or looking up answers online. However, notes, old homework assignments, and any other course materials can be used to solve the homework. Exams will be thoroughly scrutinised to ensure academic integrity.

The last part of this course will address the advanced theory of rings or the basic of Galois Theory. Given that this course is moving online-only following Spring Break, we may need the rest of the semester to cover all of Group Theory.

Exams: Exams are mandatory. Make-up exams will not be administered except where required by university policy. Should we return to our normal schedule: the

final exam differs for the two sections: Section 1 will be Thursday, 7 May, 12–3p; Section 2 will be Wednesday, 13 May, 8–11am. You must take the final exam at your scheduled time.

Should the course proceed online-only: the final exam will be a take-home exam, available 5 May at noon and due on 12 May at noon. The same rules for the take-home midterm will apply to the final exam.

Communication: Official course communications will be distributed through the announcements on Canvas, so please do not unsubscribe from this list. You may contact the instructor and the TA on Canvas or via email. We will respond to questions as soon as possible.

Grading: Your final grade is calculated based on the following scheme:

- 20% Homework + Workshop
- 20% Midterm 1
- 20% Midterm 2
- 40% Final

Homework: Homework is assigned online on Canvas. Each week of the course will have an associated homework assignment, due generally the following week at the beginning of lecture on Tuesday. Homework must be written *legibly*; unreadable assignments will receive a score of zero. Fluency in proofwriting is a major learning goal for this course, so proofs that are correct but excessively messy will lose points.

Homework is a considerable proportion of your grade and should be taken seriously. While solutions to most of the problems will exist online, not all solutions are correct. Moreover, copying answers for homework will stop you from actually learning the material.

You are encouraged to collaborate with your peers on the homework assignments with the following caveat: you must write up and turn in your own solutions. Suspiciously identical solutions will be considered a violation of academic integrity, so please write the names of your collaborators at the top of each homework – this will make similar answers less suspicious to us.

Each homework should include your name, the number of the homework assignment, your section number, and all collaborators you worked with. Homework should also be stapled or paper-clipped so no pages will be lost.

Workshop: Attendance at workshop is mandatory; discussing these new and strange mathematical concepts with your TA is all but necessary to learn the material. If you have a conflict with your workshop, you should switch to the other section of Math

351; if you have a conflict with both times, please contact the instructor. Now that we have moved online-only, we will no longer have quizzes in workshop. To compensate for this, **attendance in workshop is worth points every day**. It will likely be more difficult to learn the course material in this new format, and workshops are even more essential. You will receive the equivalent of 5 points (1/4 of a homework) per workshop. **If you have a conflict with your scheduled workshop, please email me.**

Behaviour: Students should refrain from using cell phones and laptops during class. If you would like to take notes on your laptop for class, please contact the instructor. It is unlikely you will be able to type notes for this class in real time anyway.

Academic Integrity: All students in this course are expected to be familiar with and abide by the academic integrity policy: academicintegrity.rutgers.edu/academic-integrity-at-rutgers. Violations of the policy are taken very seriously.

Disabilities: Rutgers is fully committed to compliance with the Americans with Disabilities Act; policies and procedures are indicated at ods.rutgers.edu. Students who wish to request special accommodations must present a Letter of Accommodations to the instructor as early in the term as possible, see: ods.rutgers.edu/my-accommodations/letter-of-accommodations

Student-Wellness Services:

Counselling, ADAP, & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901

health.rutgers.edu/medical-counseling-services/counseling

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901

vpva.rutgers.edu

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling, and advocacy for victims of sexual and relationship violence and stalking to students, staff, and faculty. To reach staff during office hours when

the university is open or to reach an advocate after hours, call (848) 932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus

54 Joyce Kilmer Avenue, Piscataway, NJ 08854

ods.rutgers.edu

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your course as possible. To begin this process, please complete the Registration form on the ODS website at: ods.rutgers.edu/students/registration-form.

Scarlet Listeners

(732) 214-9069

rutgers.campuslabs.com/engage/organization/scarletlisteners

Free confidential peer counselling and referral hotline, providing a comforting and supportive safe space.