MATH 4107: Abstract Algebra I

Syllabus

Fall 2026

1 Course Information

Course Title: Abstract Algebra I
Lecture Meeting Times: TR 3:30pm – 4:45pm
Lecture Meeting Location: Skiles 255

1.1 Course Content

Math 4107 is an introduction to (actual) algebra. The course will be divided into roughly three parts: group theory, ring theory, and introductory field theory.

1.2 Learning Outcomes

The primary goal of Math 4107 is to provide students with enough background in the basics of algebra to use it in subsequent courses and studies. Upon successful completion of the course, students should be able to converse about elementary aspects of group theory and ring theory, and should be prepared to study these areas more deeply.

1.3 How to succeed in this course

As an (introductory) graduate-level course, the vast majority of the work will focus on reasoning and proof. In other words, we are primarily going to be asking "why" and not just "how many/much". As such, basic literacy with mathematical proof is critical to success in this course.
On top of this, unless you have studied algebra before, you will be encountering *many* new topics and ideas, and it is unlikely that you will be able to keep up by just attending the lectures. Mathematics is meant to be known deeply, and this requires studying on your own. You should probably be spending just as much time outside of the lectures thinking about the concepts we'll be learning as you do in the lectures, if not more. I'd recommend thinking about things until they feel comfortable to use.

2 Instructor information

Instructor: Dr. Jacob W. Erickson
Instructor Office: Skiles 218A
Instructor Email: jerickson41@gatech.edu (but you'll probably have more luck contacting me via Canvas)
Instructor Office Hours:

- TBD (Zoom)
- TBD (Clough 248)

3 Textbooks and other resources

There's no required textbook for this course. There was one suggested for the course that looked decent, but there's a wealth of online information for basic algebra stuff like we'll be learning here, so don't feel obligated to get an expensive textbook. I quite like Michael Artin's (simply titled) *Algebra*, if you want a specific suggestion.

Ed Discussion:
The Ed Discussion forum is highly catered to getting your help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Ed Discussion if your questions have nothing to do with your privacy. You may post on Ed Discussion anonymously to your fellow students if that makes you more comfortable. Everyone in class should feel absolutely free to ask questions, discuss, help, comment, explore, and exchange ideas on Ed Discussion. The only restriction on questions I impose on Ed Discussion is: please do not discuss exam problems until after grades are released.

4 Course Requirements & Grading

4.1 Homework

Homework will be due about every two weeks. I'm currently planning for the problems to be a mix of intuition-building exercises and exam-type problems. You will submit the homework directly through Canvas; it should be TeX'd or written neatly. Late homework will not be accepted, and illegible homework might not receive credit.

4.2 Exams

- **Content:** We will have two midterm exams and one final exam. Each exam will cover the topics leading up to it, with the final including material from the whole course but focusing primarily on the material from the final "third" of the course. The problems on the exams should all be variations of problems from class and homework problems.
- **Midterm Exams:** We will have two midterm exams, which will take place **during lecture** on the following dates:
  1. TBD (Group theory)
  2. TBD (Ring theory)
- **Regrades:** Once an assessment is graded, you will have one week to submit a regrade request.
  - Regrade requests must reference a specific rubric item and specific part of the solution key that were not applied correctly.
  - Regrade requests may result in your grade being decreased if I observe that your solution was originally graded too generously
  - Regrade requests that do not reference a specific rubric item or part of the solution key will be ignored.

- **Final exam:** The final exam will cover all of the course material, but will focus primarily on the topics we discuss leading up to it (probably some field theory).

  Our final is currently scheduled for TBD from TBD to TBD; if there are changes, then I will let you know in advance. For the full final exam schedule, see the registrar's schedule. **Only under extreme extenuating circumstances** will you be able to take the final exam at a different time or date. Early travel plans (including already-purchased tickets) are **not** an acceptable reason for this.

4.3 Grade Breakdown

Your final grade in the class will be computed according to the table below.

Grading scheme:
10% Homework
30% Midterm 1
30% Midterm 2
30% Final

4.4 CIOS Incentive

I strongly value your feedback about the course. If at least 85% of all MATH 4107 students complete CIOS evaluations by the time of our final, I will replace the lower of your two midterm scores by the average of the other two exam scores when calculating your final grades.

If the scores on the exams are high enough that this is not a worthwhile incentive, then I will take suggestions on what would be more enticing.

4.5 Grade Assignment

After *all* grades are in and all overall percentage scores for students have been computed using the weights described above, grades are assigned. The standard cutoffs are as follows.

A: [90%, 100%] B: [80%, 90%) C: [70%, 80%) D: [60%, 70%) F: [0%, 60%)

Grades will not be rounded, but grade cutoffs may be adjusted at the end of the semester. So, to guarantee an A, get 90% or better overall. To guarantee at least a B grade, get 80% or better overall, etc.

5 Course Expectations & Guidelines

5.1 Missed work policy

If you have to miss class on a day when an exam is scheduled for any of the following reasons or any other personal emergency, I will work with you to make up the assessment, as long as you are in communication with me in a timely manner.

- **University-approved absences**: Please give me notice by the second Wednesday of the semester, or as soon as possible once your absence has been approved.
- **Religious holiday**: By the second Wednesday of the semester, you should notify me of any classes you will miss due to religious holidays.
- **Illness**: Except under extenuating circumstances, you should notify me *in advance* and for cases where you are ill enough to need medical care, provide the Office of Student Life with appropriate documentation, so that they can confirm it with me. Illnesses such as COVID, colds, flu, or other such illnesses where you feel unwell and don't want to infect others but do not feel ill enough to visit a doctor do not need documentation.
- **Family or personal emergency**: Notify me as soon as possible and when applicable (for extended absences) provide the Office of Student Life with appropriate documentation, so that they can confirm it with me.

If you do not communicate with me about your absence to set up a make-up opportunity within a week, missed exams result in a 0.

Any assignment for which no paper is received will be given a 0.

5.2 Email policy

I get a lot of emails, and it's entirely likely that if you email me directly, then I'll simply miss your message! Instead, I recommend messaging me through Canvas: it gives my email a notification that I'll recognize, and it'll drastically decrease the likelihood of your message being overlooked.
I'll try to respond to Canvas messages within one or two business days. In general, Canvas messages sent after 5pm will not receive a response until the next day, and those sent on the weekend will not receive a response until Monday.

Let's not discuss grades by email. Any questions about grades should be asked during office hours or in an appointment scheduled outside of office hours. **In particular, do not send me emails at the end of the semester asking for your grade to be changed. They will not help and I will not respond to such emails.**

Let's not discuss math by email. Let's discuss mathematics on Ed Discussion instead! This will open the question to the entire class, including all TAs and other students who may be able to provide insight. We can also discuss questions during office hours, or at a scheduled appointment outside of office hours.

5.3 Attendance in lecture

You are expected to come prepared and actively participate in every lecture. I will not take attendance, nor will there be any attendance component of your grade, but the course will be designed around the material presented in the lectures, and not attending lectures will likely leave you missing out on key information.

Class disruptions of any kind will not be tolerated and may result in your removal from the classroom. Please show courtesy to your fellow classmates and instructor by adhering to the following class rules: keep use of electronic devices focused on class-related activities, come to class on time and stay for the entire class period, refrain from conversing with your fellow students about non-mathematical topics during class, and put away any reading materials unrelated to the course.

In the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class.

5.4 Digital Learning Days

In cases where campus may be physically closed due to events such as inclement weather, a digital learning day may replace in-person classes. Should this event occur on a lecture day, then lectures will either be streamed live, or a recording will be posted for students to watch asynchronously. If a digital learning day occurs on a midterm exam date, then class lectures will meet online or asynchronously instead, and that exam will be rescheduled to the next lecture day.

5.5 Students with Disabilities and/or in need of Special Accommodations

Georgia Tech complies with the regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. If you are in need of classroom or testing accommodations, please make an appointment with the Office of Disability Services to discuss the appropriate procedures. More information is available on their website. Please also make an appointment with me to discuss your accommodation, if necessary.

5.6 Statement of Intent for Inclusivity

As members of the Georgia Tech community, we are committed to creating a learning environment in which all of our students feel safe and included. Because we are individuals with varying needs, we are reliant on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make the classroom an environment in which every student feels valued and can engage actively in our learning community.

5.7 The Honor Code and Academic Dishonesty

Do not cheat! Abide by the honor code at all times. See http://honor.gatech.edu and here.
Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Office of Student Integrity. Cheating includes, but is not limited to:

- Using a calculator, books, or any form of notes on checkpoint or celebration assessments.
- Copying directly from any source, including friends, classmates, tutors, internet sources, or a solutions manual.
- Allowing another person to copy your work.
- Taking a test or quiz in someone else's name, or having someone else take a test or quiz in your name.
- Asking for a regrade of a paper that has been altered from its original form.

Cheating does not include working together with your friends and classmates on your homework. You may use AI and other tools to help you get started on your homework, but relying heavily on these will likely result in poor performance on exams if you do not develop your own understanding of the material. AI tools may sometimes make mathematical errors, so be careful in applying them.

5.8 Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.