Instructor:	Nathan Pflueger (pronounced "fleeger")	**office hours**:	Tuesday	2:45-4:15
email:	npflueger@amherst.edu		Wednesday	1:15-2:45
office:	SMUD 401		Friday	1:30-2:30
			(or by appointment)	

Times and locations:	MWF	10:00-10:50	SMUD 014
	Tuesday	10:30-11:20	SMUD 204

Course webpage: `http://npflueger.people.amherst.edu/350/`

Textbook: *Abstract Algebra: A First Course*, 2nd Edition, by Saracino. We will cover most of chapters 1 through 22, and some special topics (time-permitting).

Goals and topics: This course is an introduction to abstract algebra, a central pillar of modern mathematics that concerns generalizations of the familiar addition and multiplication operations from ordinary arithmetic. The course focuses on three types of algebraic structures: groups, rings, and fields. For each structure, we study certain transformations between such structures, a library of important examples, and ways to construct one object from another. Time permitting, we will discuss several applications of abstract algebra, including a preview of public-key cryptography (a subject that I will most likely teach a semester-long course about in the spring).

An approximate timeline for the semester is as follows.

- 9/4-10/5: Groups and symmetry; examples (§0 - 10)
- 10/10-10/23: Quotients and homomorphisms of groups (§11-13)
- 10/24-11/7: Rings; their quotients and homomorphisms (§16-18)
- 11/8-12/12: Polynomials, fields, and other special types of rings (§19-22)

Prerequisites: Linear algebra (Math 271/2 or equivalent), or consent of instructor. In addition, students are expected to be familiar with writing and reading proofs.

Structure of the course: There will be weekly homework assignments (due Wednesday nights), two midterm exams, a cumulative final exam, and a group final project. The dates of all exams, and their share of your final grade, are listed below.

Homework	25%	
Group project	10%	
Midterm 1	15%	Friday 10/5
Midterm 2	15%	Friday 11/30
Final exam	25%	Date/time TBA
Your best exam	10%	(added to its original weight)

Homework: Homework will be **due at 10pm** on Wednesday evenings, via an online system called Gradescope. To allow for technical difficulties or other last-minute issues, Gradescope will allow you submit homework after the deadline, however your score will be reduced by 2% per hour after the deadline (scaled continuously, e.g. being fifteen minutes late results in a 0.5% deduction). Please try to turn in your work by 10pm (I don't want to be responsible for lost sleep!), but don't worry about short delays.

I do not grant extensions for any reason. However, to compensate for illness and other emergencies, your **lowest two homework scores will be dropped**. If you cannot make a due date due to an emergency, my advice is to simply skip the assignment, study and understand the posted solutions to catch up, and focus on keeping up with the new material in the course. You do not need to apologize or provide any reasons for skipping an assignment or turning it in unfinished; please choose what is best for your time, health, and well-being.

The Group Project Near the beginning of November, you will be assigned to a group for a final project. Each group will write a summary/report on a topic or application not covered in class (these will come from a list of topics that I will not lecture on) and present that topic in front of the rest of the class during the last week of classes. Your grade will depend on the quality and depth of your groups summary/report and on your individual performance during the presentation. Additionally, I will ask an individual question to every member of each group once they have concluded their presentation. The project is meant to be fun and a good experience for you to improve your mathematical reading, writing and oral skills. You are welcome to discuss the content of your presentation and the topic, individually or as a group, during office hours.

LaTeX: I encourage you to learn how to type your mathematical work in LaTeX (the most commonly used system for mathematical typesetting). It is relatively easy to learn and is a convenient skill for any technical writing you do in the future. To incentivize learning it, **you will receive 2% extra credit** on any problem set you typeset. In addition, the **group project write-ups must be typed in LaTeX**, so at least one member of each team will need to become familiar with it. There are many great resources online to learn LaTeX, and our Math Fellows will be able to provide support and advice as well.

Missed exams: If you are ill or an emergency arises near an exam, notify me as soon as possible. If you have a time conflict with an exam, notify me as soon as possible, and **at least one week in advance** (exam dates are listed above).

Accommodations: I strive to make this course welcoming to all students. If you would like to discuss your learning needs with me, please schedule a meeting so that we can work together to support your academic success. Anyone who may require an accommodation based on the impact of a disability should contact me to make arrangements. I rely on Accessibility Services for assistance in verifying the need for accommodations and developing accommodation strategies, so you should contact them at `accessibility@amherst.edu` or 413-542-2337. If you require accommodations on exams, please arrange this with me at least one week in advance.

Intellectual responsibility:

- **Homework:** Mathematics is a collaborative subject; open and generous communication is one of its core values. Therefore you are strongly encouraged to work with other students, ask
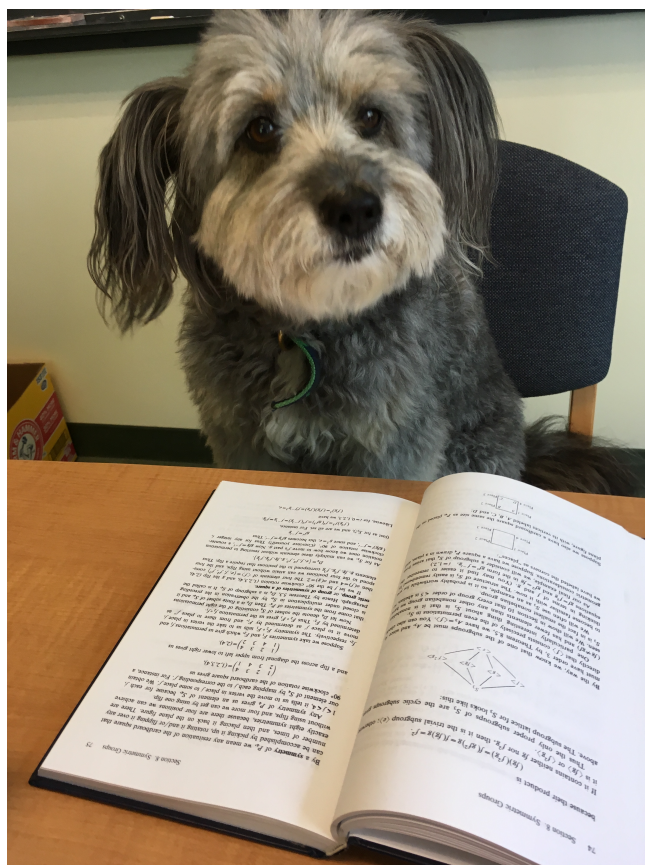
many questions, and learn from as many people as possible. However, you must write up the solution yourself. **All your submitted work must be your work, written in your own words,** with the exception of Mathematica labs, which are written in small groups. Copying solutions from other students, solutions manuals, or online databases is plagiarism; such copying will result in a 0 on the assignment and will be reported to Community Standards. You are also expected to **list each person your worked with** on the front of your homework assignment.

- **Exams:** You will be allowed **one page of notes (front and back)** for each exam. No calculators or other aids are permitted. Cell phones should be stowed out of sight during exams. Use of cell phones or other devices during the exams will be grounds to receive a 0 on the exam. You are bound by the college's honor code, and all work must be entirely your own on exams.

For both homework and exams, I reserve the right to give no credit for any work that appears suspicious.

Tips:

- **Come to office hours!** I am happy to answer your questions and also talk about the course in general. Even if you don't have specific questions, you can come to review material, listen to other students' questions, or just to chat. I will also often have **my dog, Charley** on hand (this will always be announced in advance), and you are always free to come exclusively to visit Charley.
- **Review early and often.** You should constantly be looking over your notes and keeping the big picture in mind. Arrive each day in class with a sense for where we are.
- **Keep a positive attitude.** Learning is a long process, and you will struggle often. Remember that struggle and difficulty is how you grow. Don't be afraid to talk to me about whatever difficulty you're facing. I want all of my students to be successful and deepen their mathematical skill and appreciation.
- **Practice, practice, practice.** Start early on homework, and let hard problems simmer in your head. Try unassigned problems in addition to homework. Read the book, and *read actively*, always questioning, summarizing, and interpreting what's on the page.

Resources and additional help: Be sure to take advantage of office hours, and your peers, to answer questions and think through the material. The staff at the **Moss Quantitative Center** in the New Science Center will host regular help hours, and are available for individual appointments. We also have two Math Fellows for the course, who will hold regular office hours, host exam review sessions, and are available to help with LaTeX. The schedule of these help hours will be posted on the course website once they are set. Finally, some students may benefit from a peer tutor, if they are already using the available help hours and require additional support. Peer tutoring is a limited resource, so please speak with me about it before requesting tutoring.

email policy: The best way to reach me with course questions (besides office hours) is by email. I generally reply to email within 24 hours. However, **I often do not reply to email on weekends**. I will also reply less quickly on Thursdays, which is the day I devote primarily to research.