

## MATH 327 – Group Theory (Fall 2025)

**Instructor:** Kevin Woods. Call me Kevin! (he/him)

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**Class:** MWF 1:30-2:20pm, King 243.

**Google Drive:** I will post assignments and other material in the course [Google Drive folder](#).

**Problem Sessions:** Come individually, come in groups, come with questions, come to get started on the homework with other students around. Your choice! Showing up to this is a great way to find other students to collaborate with. Either I or a dedicated tutor will be there to facilitate group work and give help:

- Sundays 2:30-4:30pm, King 243 (with David Bronshvayg)
- Mondays 4:30-6:30pm, King 243 (with Max Novik)
- Tuesdays 12:15-2:15pm, King 203 (Math library, with me)

### Other Office Hours:

- Mondays 2:30-3:30pm, my office (King 220B)
- Thursdays 9-11am, my office (King 220B)
- If these times don't work, you can make an appointment via email.

### Textbook:

- *Algebra in Action*, by Shahriar Shahriari, first and only edition. You will need some version of this text to read before each day of class.
- To give you time to get it, I've [posted](#) the first chapter, which will last us two weeks, in our google drive.

### Prerequisites:

- MATH 220 (Discrete Mathematics). The most important thing from Discrete is comfort with mathematical proofs and readiness for a 300-level math class. We will also use content you learned about: elementary number theory, functions, equivalence classes, and basic combinatorics.
- MATH 232 (Linear Algebra). This class further solidified your comfort with proofs. Matrices over fields will be a very common example that we use, so you will need some knowledge of vector spaces, matrix multiplication, and determinants.

### Learning Goals:

At the end of this course, students will:

- Have experience thinking about an abstract object (groups), defined axiomatically, and the ability to prove facts about their algebraic structure.
- Have facility with many examples of groups, and understand how group theoretic ideas interact with other areas of mathematics.
- Improve your mathematical reading and writing skills.
- Struggle with mathematics concepts, practice persistence, and develop confidence in the face of difficulties.
- Have experience working with other students on mathematics (this one is up to you to work on).

### Assignments and Grades:

- Your focus should be on **growth**, but grades are a fact of college life. **If I can see that you are working hard and seeking support, you will pass this class.** If you find yourself preoccupied with grades, consider taking it P/NP.
- Each Friday, I will give you a schedule of the specific assignments for the next week. These will also be posted in our google folder.
- Note that almost every type of assignment has some sort of forgiveness (e.g., dropping some number of them). Life happens: you get busy, you get sick, you oversleep, you struggle in the class but slowly improve, and I want to acknowledge that.

- Reading Questions (15%, lowest three dropped).
  - Learning complicated mathematics takes multiple exposures, and I would like class to be your second exposure to the material. Reading a mathematical text is challenging, and I really want you to practice this skill. Because of this, you need to read the book beforehand. To encourage this, you must answer a few questions before each class.
  - You must answer these by **11am the day of class**. These will not be graded for correctness, only that you made a legitimate attempt at them. These will also be helpful to me to see what I need to emphasize in class.
  - To submit answers, read the questions on the weekly schedule of assignments, and then submit your answers on this [google form](#).
  - Since the point is to force you to read before class, I do not accept late submissions (but each one is worth a very small percentage of your grade, and I will drop three).
- Problem sets (65%, lowest two dropped).
  - The best way to learn the tools and concepts in this course is to get your hands dirty! This is also an opportunity to work on writing careful, clear proofs and explanations. Good mathematics is articulate mathematics! Explain things carefully and in complete sentences. Imagine that another student in the class who hasn't done this problem yet will read your solution: they should be able to understand it without having to ask you questions.
  - Problem sets will be assigned each week and generally due Wednesdays at 10pm, submitted via [gradescope](#).
  - Late Work: I will give you until Thursday 10pm for problem sets, if you ask in advance and don't make a habit of it. After that, late work is generally not accepted, because it needs to go to the graders. I drop two problem sets because I know that everyone has bad days or weeks, so it is perfectly ok to simply skip that week.
  - Honor Code: I encourage you to work together on the homework sets. Your solutions must be in your own words, however. Work on the problem together, and then go back home and write up your solution. You should never go looking for the solution to a specific problem: for example, **don't read someone else's solution, search the internet or a book, or ask reddit/AI/etc**.
  - You get out of problem sets what you put into them. It's the struggle that helps you learn: unless you go to graduate school, you may never see another group, but it's the logical thinking, creativity, and persistence through struggle that will be applicable to your entire life. So **do struggle** and get help for many sources, but **don't shortcut** this learning process by looking for easy ways out.
- Final exam (20%)
  - This will have an in-class and a take-home portion.
  - The in-class final is Tuesday, December 19, 7-9pm. It will be designed to assess your facility with the many concepts, theorems, and examples that we have been studying. It will be closed book, though you will be allowed a page of notes.
  - The take-home portion will be relatively low stress (no hard math problems), designed to get you to reflect on your semester of learning. It will be due before the start of the in-class exam.

### Support:

- You belong at Oberlin and you belong in this class. People arrive here with different experiences and backgrounds in mathematics. Put in the work, seek out support, and focus on self-improvement, and I promise you that **your mathematical skills will grow**. The rest of us are here to help, including:
- Me! Come by office hours, any time.
- The dedicated tutors! (David and Max.) See the problem session times above.
- Your peers! Working with other students helps everyone improve.
- **Yourself!** Your skills will improve best if you come at this with a growth mindset: embrace the challenge of this class, persist through difficulty, be inspired (not threatened) by the success of others, seek out support, communicate and advocate for yourself.
- If you have a disability of any sort that may affect your performance in this class, please consult with me and with the Office for Disability and Access. I am committed to meeting the needs of all students in my class.
- **I want you to succeed, and I want to help you succeed.** Please let me know how I can help!