

## Math 220 – Discrete Mathematics (Spring 2021)

**Instructor:** Kevin Woods, Kevin.Woods@oberlin.edu. Call me Kevin! (he/him)

### Links:

- [Class zoom meetings](#) (MWF 9am, Wed required attendance)
- [Homework submission](#)
- [Google Drive folder](#)
- [Kevin's office hours](#) (Tues 9-10:30am, Wed 1:30-3pm, and by appointment; I will also stay after class for questions)
- [Averly's drop-in tutoring](#) (Tues 4-6pm, Thurs 7-9pm)

### 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 (link above) or send me an email, any time.
- Averly! Averly Sheltraw is our dedicated tutor (link above), so she is focused on working with this class. Go say hi the first chance you get!
- Your peers! Working with other students helps everyone improve. Collaborative work is encouraged on all aspects of the course outside of exams. The only stipulation is that, after working together, you write up your own solutions separately and also acknowledge who you cooperated with.
- 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.
- Student Academic Success Programs. They may be able to provide individual tutoring. All requests for disability accommodation must also go through that office.

### Required Textbooks:

- Kevin Houston, *How to Think Like a Mathematician*. We will cover the entire book, plus additional topics in combinatorics, graph theory, and general problem solving, for which I will give you material. Mathematics is a language: in addition to teaching you mathematical content, this book teaches you how to read, write, and think in this new language you'll be learning.
- Francis Su and Christopher Jackson, *Mathematics for Human Flourishing*. We will read the entire book and discuss it. While the other book is a classical textbook teaching you content within mathematics, this book tries to connect mathematics to what it means to be human. It's inspiring!

### Class: MWF 9-9:50am.

- Wednesday meetings will be on zoom only, and live attendance will be **required** as part of your participation grade. These will involve discussions and small group work. We're missing a lot of a sense of community right now, and this is the best place to find it within this class. So please come excited and (if at all possible) with your video on.
- Monday and Friday will be in King 343 (starting in Week 2). I strongly encourage you to come in person or attend live on zoom; it is the best way to keep yourself engaged! I will record Monday and Friday lectures, in case you miss them or want to review something.
- You should read assigned sections of the text(s) **before** class. I will teach with the expectation that you've seen the big ideas, and we'll use class time to work on details and examples. Like in a language class, a lot of the hard work (learning the vocabulary, for example), happens **outside** of class; class time just gives us a little more practice.
- Since Wednesday's classes will be low on "content", I may need to supplement with recorded videos. I will try not to overwhelm you, because I know you are busy.

### Google Drive:

I will post assignments, graded homework, videos, etc, to our google drive folder (link above). Blackboard will just be a shell: links to zoom, google drive, a repository for email announcements, etc.

### Learning goals:

At the end of this course, students should be:

- Prepared for upper level mathematics courses and courses in related fields.
- Able to understand the logic of mathematical reasoning.
- Able to conceptualize and write mathematical proofs.
- Able to read and critique mathematical proofs.
- Proficient in creative problem solving.
- Conversant with the language of mathematics.
- **Able to persevere when faced with mathematical challenges.**

### Grading:

- 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/NE.
- Participation (10%)
  - You must show up on Wednesdays, prepared to discuss and work with others. I will forgive not showing up for two classes, but after that your grade here will go down.
- Written Homework (40%)
  - You will have a written assignment due pretty much every day of class, submitted as a pdf by following the link above.
  - Monday and Wednesday's assignments will be mostly informal writing, graded based on making a good-faith effort. I suggest writing in Word or Google Docs and converting to a pdf before submission. If they have a lot of mathematical notation, you can also write them by hand, and use a phone app like Adobe Scan to make them into a pretty pdf. These are designed to get you prepared for class and thinking meta-cognitively about learning and doing mathematics.
  - As such, these must be turned in by the time class starts, and **no late work will be accepted.** I understand things come up, so I will drop 4 of these at the end of the semester.
  - Friday's assignment will be a longer one focused on solving problems and communicating results. I'm looking for not only correct solutions, but clear ones too: you're learning how to write in a foreign language. For the first few weeks, you probably want to write by hand and then use an app like Adobe Scan. In a few weeks, I'll expect you to type them up using LaTeX (I'll give you help and instructions); this will allow you to edit your writing and think carefully about language.
  - Again, **no late work will be accepted**, except you can have until 1:30pm on Friday, in case you have last minute questions. I will drop 2 of these at the end of the semester.
  - I encourage you to work together. What you turn in must be in your own words, however. Work on the problem together, and then go back home and write up your solution. In particular, you should never look at someone else's write-up before it is due. As part of the honor code, you should also acknowledge who you worked with.
- Two midterms and a final (25% each, lowest one dropped)
  - These will be open book/notes and take-home, but you will not be able to consult with any other people or resources.
  - The midterms will tentatively be due at 9am on Monday, March 8 and Monday, April 5. The final will be due at 11am on Monday, May 10.
  - I want you to succeed, and everybody has bad days or weeks. **I'll drop the lowest exam score, as long as you put in a good-faith effort on the final exam.**