

## Math 220-01 – Discrete Mathematics (Fall 2015)

**Instructor:** Kevin Woods, King 220B, Kevin.Woods@oberlin.edu. Call me Kevin!

**Class:** MWF 10-10:50am, AJLC 201.

### Office Hours:

MWF 9:20-9:50am & 11-11:30am, TTh 3:30-5pm. Also, feel free to stop by any time my door is open (but be understanding if I say I am too busy), or you can make an appointment via email.

### Required Textbook:

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. This book is on reserve in Mudd. You may also view an electronic copy of it by searching for it at `obis.oberlin.edu`

### Blackboard:

I will post homework, reading, and other announcements.

### Outline of course:

Mathematics is a language. The primary goal of this course is to help you learn that language. As such, you will be reading, writing, and speaking Math on a regular basis. This class requires your active participation, just like a Spanish class would. I won't lecture for that much of the class. I don't need the practice – I already know how to speak Math!

You're used to turning in the end products of your mathematical work – the typical homework solution – and we'll do plenty of that. But this class is also concerned with the *process* of doing mathematics. How do I attack a problem? How do I take my scratch work and turn it into a solution? We will do reading, discussion, and writing (both formal and informal) to address that.

### Grading:

Written Homework (30%),  
Presentations and Participation (20%),  
Two Midterms (17% each),  
In-Class Final Exam (16%).

#### Written Homework (30%)

You will have a written assignment due pretty much every day of class. Generally Friday's assignment (starting September 11) will be a longer one that I expect you to type up using LaTeX (I'll give you instructions), and Monday and Wednesday's assignment will be a shorter one designed to get you ready to participate in class (including writing up a solution that I may ask you to present).

I'm looking for not only correct solutions, but clear ones too. You're learning how to write in a foreign language. Content counts but so does how you say it. Some problems will be marked as *informal*. In this case, I will not grade it for correctness, but rather effort and thoughtfulness.

### Presentations and class participation (20%).

Much of class-time will be spent on student presentations. You may be called on to present a solution to a problem that was assigned for that day. Or I may ask for volunteers to present a solution or to talk about how they started attacking a problem.

I have office hours MWF 9:20-9:50, as well as other times: I would be happy to hear you give a practice presentation and then let you present that problem in class. I know this can be scary for many of you (it used to be scary for me too!), but it is valuable, and you will get better and more comfortable, I promise.

When one person is presenting, every student in the class has a responsibility. Ask yourself, "Is this presentation correct, and is it clear?" The student at the board is not yet fluent in Math, and they will often need your help. It is your responsibility to help them.

Two things go without saying (yet I'm saying them anyway). Firstly, all of this must take place in an atmosphere of respect and encouragement: we have to create an environment where it is ok to tell someone that you think they are wrong or unclear without offending them. Secondly, you cannot participate if you are not here and here on time. I understand that you may have to miss a class or two. Excessive absences or lateness will hurt this portion of your grade.

By the end of the semester, you will be learning some of the material solely by working problems and hearing presentations. Besides learning the material, there are two reasons to follow the presentations carefully. I will often ask you to turn in a written up version of one of these for a grade. And I will always put at least one of these problems, word for word, on the midterms.

If you show up (on time) basically every day, work in groups well when instructed, and present adequately when requested, you will earn a B on this portion of your grade. To earn a higher grade, you should impress me by presenting harder problems, asking good questions in class, etc.

### Midterms (17% each).

These will have an in-class component (closed book, with a page of notes allowed), followed by a couple of take-home problems due the next class period. Tentatively, the in-class components will be Wednesday, September 30 and Wednesday, November 11.

### In-Class Final Exam (16%).

Friday, December 18, 2-4pm. The final exam will cover the entire course, with an emphasis on the most recent material. It will be closed book, with a page of notes allowed.

### **Working, and working together:**

You will get out of this class what you put in it (cliché, but especially true in this class). To me, this means doing the following day-to-day:

- Doing the assigned reading before class. And doing it actively! Take notes, work out your own examples, etc.

- Attempting every problem before it is presented on the board (you will probably not solve every single one ahead of time, but the more work you put into that, the better problem solver you will become).
- Looking back at your notes after class and fixing them so that you have a careful solution to the problem that you will be able to comprehend later (say, exam time). To encourage this, some questions on the midterm exams will be problems that have been presented in class.
- Actively listening when someone is presenting. You should be asking yourself, “Is their presentation correct and clear?” If it isn’t, we should discuss it as a class afterwards.

Math goes much easier with someone else around to bounce ideas off of. I encourage you to work together. I suggest that you take a minute at the end of class today to write down contact information for at least two other students:

**Name:** \_\_\_\_\_ **Contact Information:** \_\_\_\_\_

**Name:** \_\_\_\_\_ **Contact Information:** \_\_\_\_\_

**Honor Code:**

I encourage you to work together. Written assignments 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.

Other than the other students (and me!) and our textbook, you may not use any other outside sources, including other Discrete Math texts or solution manuals. If you would like to look at other texts after you’ve turned in the homework, in order to study for the exams, you are welcome to.

**Disabilities:**

If you have a disability of any sort that may affect your performance in this class, please consult with me and with Jane Boomer in the Office of Disability Services. All requests for accommodation must go through that office.