

## **Math 220 – Discrete Mathematics (Fall 2008)**

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

**Class:** Section 01: MWF 2:30-3:20pm, King 321.  
Section 02: MWF 3:30-4:20pm, King 239.

### **Office Hours:**

Monday 9:30-10:30am, Tuesday 2:00-3:00pm, Thursday 4:30-5:30pm, Friday 1:30-2:30pm.  
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:**

Edward Burger, *Extending the Frontiers of Mathematics*, 1<sup>st</sup> and only edition. We will tentatively cover Chapters 1, 2, 3, 4, 6, 7, 8, 9, 10, and 11, and then see where we are.

### **Blackboard:**

I will post homework, reading, other announcements, and grades on Blackboard.

### **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. One thing you will rarely see is me lecturing for a long stretch of time. I don't need the practice – I already know how to speak Math!

You'll notice that our textbook is fairly small and has lots of problems. It is small because you will effectively be creating the textbook by solving the problems. To contrast it with a math class you've had before: In Calculus, you listened to the lecture and you read the book to learn the concepts, and then you do problems to solidify and apply the concepts. In this class, you will actually learn what the concepts *are* by solving the problems.

### **Grading:**

Presentations and class participation (20%),  
Written Homework and Peer Comments (20%),  
Two Take-Home Midterms (20% each),  
In-Class Final Exam (20%).

Presentations and class participation (20%).

Much of the class period will be spent on student presentations. We will generally work through each chapter in order (harder problems may sit around unsolved for awhile, but we'll get them!). Everyone should come to class each day prepared to present **at least one problem** other than the ones being turned in as written homework (see below). Of course everyone won't speak every day, but I'll do a combination of calling on specific people and asking for volunteers.

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.

#### Written Homework and Peer Comments (20%).

At the beginning of each Monday, you will be responsible for handing in solutions to problems. I will put these problem numbers on the board each day, and I will also put them on Blackboard. Sometimes the problems will have already been presented in class, and sometimes they will never be presented and you will have had to figure them out on your own or with other students. I’m looking for not only correct solutions, but clear ones too. You’re learning how to write in a foreign language, so content counts but so does how you say it. Most will be graded by me or the grader, with either a check, check-minus, minus, or zero. A check will be awarded for **correct and clear** work with no or very minor problems, a check minus for work that is good but with minor problems in correctness or clarity, a minus for things with major problems, and a zero for things that aren’t turned in at all or are way off.

To encourage you to proofread and make changes for clarity, you must **type** your solutions. You will generally turn in three days’ worth of homework: each day must be on a separate piece of paper, as they will be divvied up.

For typing up solutions, Microsoft Word works fine (for special math things, you can go to “Insert > Object” and choose “Microsoft Equation”). If you’d like to go all out, LaTeX is the gold standard for writing pretty mathematics. Check out “The Not Short Introduction to LaTeX” online. There are many free implementations of LaTeX; I use WinEDT as my front end for Windows; TeXShop is popular for the Mac.

Each week, one of the homeworks will be shuffled and handed back out for peer comments. These will be due back to me the next day of class. You will read this person’s work and make comments. Try to find at least one thing positive to say, and at least one constructive criticism. Both the reviewer and the reviewed will be graded (by me, either a check or a zero) for their reasonable attempts at their respective jobs.

Late Work Policy: Homework that is graded by me or the grader can be turned in until I start grading it or the grader takes them to be graded (no guarantee when that will be). Homework for peer commenting must be turned in at the beginning of class, or else you will get credit for neither turning it in nor commenting on a peer’s. However, I will drop a week’s worth of homework grades at the end of the semester.

Take-home midterms (20% each).

Tentatively due October 8 and November 12. You will choose a continuous 24 hour period within the span of about 4 days in which to take the test. The exams will be designed to be doable in 3 or 4 hours, but you'll have the extra time to "sleep on it." You will work alone and be able to use the textbook and notes, but no other outside sources.

In-Class Final Exam (20%).

Tuesday, December 16, 2-4pm (for the Section 1) and Friday, December 19, 2-4pm (for Section 2). The final exam will cover the entire course. It will be closed book, but you will be able to use something like an 8.5x11 sheet with notes.

**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:

- 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 two other students:

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

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

**Honor Code:**

I encourage you to work together. You may also work with people from the other section, except on problems that one section has presented but the other hasn't. 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. We're effectively creating our own text with theorems and our own proofs, so it would be cheating to read one someone else has already written!