Discrete Mathematics, MATH 215

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Office Hours:	Monday: 3-4pm, Thursday 12:30-2:30pm, Friday: 10-11:30am , BoDine 304 or by appointment
Website:	https://lucasvanmeter.github.io/classes/MATH215/index.html
Textbook:	*Discrete Mathematics (and Other Stuff)* by John Krussel. This text is available at the bookstore.

Overview

Humans have built a huge and important body of knowledge called mathematics. If you like thinking about infinity, neural networks, the Fibonacci sequence, or the shape of the universe, math has a place for you! Over the years mathematicians have built up a large vocabulary and set of tools to tackle all of these questions.

In discrete math we will learn about the foundations of mathematics and how to prove things. We will learn about counting, number theory, sets, logic, functions, and graph theory. Along the way we will learn how to think logically and practice many proof techniques. We will also learn how to write and communicate mathematics effectively.

Course Learning Objectives

Some of the goals for this course are:

1. To develop skills needed in order to read, write, recognize and appreciate a (good) mathematical proof.

2. To develop fluency in using basic logic and set theory, including the language of functions and relations.

3. To gain familiarity with certain areas of mathematics which could be labeled as being "discrete" such as combinatorics, number theory, and graph theory.

4. To develop an appreciation for some piece of mathematics.

Active Learning

This class will use many *active learning* teaching techniques. Active learning refers to a broad range of teaching strategies which engage students as active participants in their learning during class time with their instructor. Typically, these strategies involve some amount of students working together during class, but may also involve individual work and/or reflection.

I use active learning both because I personally have found it to be effective and because there is a large amount of research suggesting that such strategies help students learn. For example, one such article suggests that student performance in active learning classes increased by just around a half a standard deviation and students in traditional lecture courses are 1.5 times more likely to fail than students in courses incorporating active learning.

This style of teaching may feel different from previous math course you have taken but I think if you try to work with it you will find it rewarding (and fun!). Because we spend more time in

class doing active learning (because class time is the only time we are all together) it becomes all the more important that you spend time outside of class reading the textbook.

I will leave you with one last study. This study found that students in active learning classrooms performed better than students in traditional classes but self reported that they had learned less.

Homework

There is an old saying that mathematics is not a spectator sport. The true test of whether you understand a mathematical topic is if you can solve problems, even if you are able to follow everything in the text and in class. At a deeper level, research in learning theory and in mathematics education suggests that working problems on your own is not just a convenient measure of your mastery of the material, but is actually a necessary step towards understanding.

This is the main reason why homework is assigned and collected in this course. There are also two secondary reasons why homework is assigned, collected, and graded, and why late homework is strongly discouraged. Secondly, the homework provides us with an easy way of telling whether the class and I are on track. If I find out a few days after covering a topic that most of the class is having trouble with it, we can easily go back and mend the problem; if I discover the same thing two weeks after covering the topic, we probably have a serious problem that is not easily remedied.

Homework will be due most Mondays and Thursdays in the SQRC by the end of the day.

Exams

There will be three exams and a final. Each exam will consist of two parts: an in class portion, and an out of class portion. The in class portions will be 50 minutes, no notes. The out of class portions are more like homework assignments and you will have a couple days to finish them, and you may use your book and notes, but you may not discuss them with anyone or use any other sources.

Revisions

An important part of learning is to revise our errors. You are allowed to revise and turn in one stared problem on each homework and take home exam, which I will regrade. You turn revisions in to me directly. On a fresh sheet of paper you should write the entire problem statement, and then provide a clear answer. Feel free to come talk to me about problems before you revise them.

Grades

Your course grade will be determined based on your percentage of points received with these approximate weights:

Category	Percentage
Homework	40 %
Exam 1	15 %
Exam 2	15 %
Exam 3	15 %
Final	15 %
Total:	100%

Strategies for Success

Learning mathematics is not a spectator sport. It requires active engagement and practice. Here are some behaviors of successful students:

- *Actively* read the textbook. Write down questions as you read, try (for a at least a minute) to prove things before reading the books proof, underline things!

- Come to class prepared to discuss the current section, ask questions, actively participate in discussions, and bravely embrace the mistakes that all of us make when we make an honest effort.

- Come to office hours!

- Visit the SQRC.

- Form a study group, ask each other questions, gain deeper understanding by explaining things to each other.

- Actively seek out help when you feel confused or unsure about how to learn effectively. Here are some people that can help you:

- SAAB tutoring is a free tutoring service. See https://college.lclark.edu/academics/support/advising/saab-tutoring/

Collaboration

Collaboration is an important part of learning mathematics and I strongly encourage you collaborate with your classmates on homework and studying for exams. With that said, there is a difference between working with someone else and copying down what they say or write without understanding it. If you read the entire syllabus and made it this far, send me an email with joke in it.

On written homework, you are encouraged to work together, and you may get help from others, but you must write up the answers yourself. If you are part of a group of students that produces an answer to a problem, you cannot then copy that group answer. You must write up the answer individually, in your own words.

Academic Integrity

Any form of academic dishonesty or misconduct will not be tolerated. Cheating of any form will result in disciplinary actions, such as a zero grade or immediate failure of the course, and will be reported to the Office of the Dean.

Festival of Scholars and Artists

The Festival of Scholars and Artists is a campus-wide celebration of student work. It is an opportunity to discuss research, to exhibit, perform, or appreciate art, and to cross disciplinary boundaries. The Festival will be held on Friday, April 17, 2020. Classes will be canceled on that day, but you are still required to participate in the Festival, either by presenting your work or attending presentations by your fellow students. When the final program for the Festival becomes available, I will recommend attendance of specific presentations, and will explain how attendance will contribute to your course grade.

Academic Accommodations

If you require academic accommodations please contact the Student Support Services Office in Albany Quadrangle (503-76-7192 or access@lclark.edu). Once you complete the intake process and the Accommodations Agreement, you may Request to Send your Accommodations Letter. Student Support Services staff will then notify faculty of the accommodations for which you are eligible.