

MATH 2001: Introduction to Discrete Mathematics (Spring 2020)

MWF 9:00-9:50 am, ECCR 131

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Office hours: Tuesday 3-4 pm, Wednesday 10-11 am

Course website: <http://math.colorado.edu/~mayr/teaching/math2001spring20/>

Course description. Do you know a formula for adding up the first n positive integers, $1 + 2 + \dots + n$? How can you find such a formula and convince yourself and others that it is actually correct?

The goal of this course is to enable you to read and write mathematical texts and to prove mathematical statements on your own. We will learn and practice these skills in the area of discrete mathematics (as opposed to “continuous” mathematics like calculus or analysis). In particular we will cover the following topics:

- sets - the basic building blocks to formulate Math
- logic - how to reason about facts
- combinatorics - counting
- methods of proof - how to organize arguments
- relations and functions - interactions between elements of sets

Assignments. Every Friday I will post homework problems on the website. Please hand in solutions at the beginning of class on the following Friday or send a pdf at least 30 minutes before class. Please use “Math 2001 - assignment n” as title for the mail for the n -th assignment (otherwise I will not find and grade it). Additionally there will be 4-5 writing projects during the semester.

Since communicating about mathematics is one goal of this course, you are allowed and encouraged to discuss your assignments with others. However I ask you to follow this approach: First try to solve your problem on your own. If you get seriously stuck, discuss it with your colleagues, me, etc. In any case write up the solutions that you hand in alone.

There is a short quiz every Wednesday, 2 midterm exams in class on Wednesday, February 19, and on Wednesday, April 1, as well as a final exam on Tuesday, May 5, 1:30-4:00 pm.

Grading. Your final grade will be determined by the scores of your homework, quizzes, midterms, and final exam. To combine these items the following weights will be used:

Homework: 25%

Writing projects: 15 %

Quizzes: 15 %

Midterms: 25%

Final exam: 20%

Late homework will not be accepted. However the 2 lowest homework scores and the 2 lowest quiz scores will not count towards the final grade.

Texts. Richard Hammack. The Book of Proof. Creative Commons, 3rd edition, 2018. Available for free: <http://www.people.vcu.edu/~rhammack/BookOfProof/>

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How to succeed in this class.

Go to class! It seems obvious, but learning the material in small portions 3 times a week is easier than reading up on it in some book by yourself. Always keep up with the topics. You also get nerdy Math jokes.

Ask questions early and often! If you are not sure about something, ask about it immediately – no matter whether in class, in office hours, or by mail. Do not assume that you can skip or figure out things later that you do not understand now. If you are missing the basics, you may fall behind and struggle with more complicated concepts later in class.

Do the work! The only way to learn stuff is to try it yourself. Strive to do all the homework assignments. Some will be more challenging than others. If you are stuck on the hard ones, discuss them with colleagues or ask for possible hints in office hours or by mail.

Learn from mistakes! Look at all feedback you get on graded homework, quizzes, exams, etc. Make sure you understand where you went wrong and how to get the correct solution. In particular revise all relevant graded work before exams.

Organize in study groups! Meet with classmates a couple of times a week to discuss lectures and homework. Still write up your solutions to assignments when you are alone, never in a group.

Take advantage of office hours! If you cannot make it to the official hours, ask to meet at some other time. Office hours are an additional resource for you to discuss stuff for which there is no time during class. Come prepared! Try to solve homework problems alone before you ask for help and be ready to explain your thoughts and where you are stuck.