Math 203-Fall 2024

Honors Mathematics I

General information

Class time: MT(W)ThF 11-11:50am
Class location: Eads 215
Instructor: Greg Knese
Email: geknese AT wustl DOT edu
Office hours: M 1-2pm, W 10-11am
Th 12-1pm

Office location: Cupples I Room 214
Discussion meeting: W 11-11:50am
Assistant to the Instructor: John Naughton
AI Email: j.naughton AT wustl DOT edu

Course description

This is the first half of an *intensive* one-year calculus sequence for first year students with a strong interest and background in mathematics with an emphasis on rigor and proofs. The course *material* starts without necessarily assuming much prior knowledge but we assume the *student* has already studied the material from a more mechanical/ technical point of view. Students who complete both semesters will have completed the material for Calc III, Matrix Algebra, Intro to Proofs and other topics that may let them move through the upper level math curriculum more quickly.

Topics: Axioms of the real numbers, mathematical induction, methods of proof, integral calculus, continuity, differential calculus, fundamental theorem of calculus, transcendental functions, polynomial approximation, differential equations, complex numbers, sequences and series, sequences of functions, vector algebra, calculus of vector-valued functions, linear spaces, linear transformations.

Prerequisite: Score of 5 on the AP Calculus Exam, BC version, or the equivalent.

Textbook

Tom Apostol, Calculus, Vol. I (2nd Edition), Wiley, 1991
is the text for this class. (Apostol's Vol. II will be the text for Math 204.)
You should have your own copy because we will have required readings from the book. We will cover so much material that it will not be possible to discuss everything in class. We will discuss where to obtain a copy of the text.

Exams

There will be two in-class midterm exams (**September 26 and October 31**) and a final exam. The final exam is **Dec 17, 2024, 10:30am-12:30pm**. The exams will not be overly cumulative but some previous material is inevitable.

Homework

We will have weekly homework assignments. These will be submitted via gradescope.com (let me know if you have any questions about using this tool).

Grading philosophy: We are learning to do rigorous mathematics. Our goal is to write iron-clad logical and understandable proofs. In previous computational math courses, one may receive partial credit for having some idea correct or you may get the benefit of the doubt on certain mistakes. In proof writing, the writer does not get the benefit of the doubt. It is much better to confess that you do not how to write something rigorous than to pretend that you can. Obviously when learning something new you may not have complete awareness of when you are doing something wrong—but the goal we strive for is to attain this awareness.

Collaboration: You may discuss the homework verbally with other students provided you have already given the homework a serious attempt. If you have already solved a problem and someone asks you about it, then any help you provide should consist of hints or suggestions and never complete solutions. In particular, homework should be written up independently and it should not be possible to tell who worked with whom. Do not search or post requests for solutions to HW. Do not post any course materials online.

Dropping/Late policy: Your two lowest homework score will be dropped. This policy is designed to take care of all instances where a student cannot complete an assignment on time so that the instructor does not need to make subjective judgement calls. Late homework will not be accepted so that solutions can be posted in a timely manner.

Discussion Meeting

Every Wednesday class time will consist of a discussion section led by a graduate student (John Naughton). The discussion will begin with a 10 minute quiz and the remainder of the time will be spent on discussing problems.

Your lowest two quiz scores will be dropped. The same philosophy as with homework applies.

Grade breakdown

Homework: 40%
Midterm exams: 12.5%+12.5% = 25%
Quizzes: 10%
Final exam: 25%
Letter grade breakdown: A+=(97,100], A=(93,97], A-=[90,93], similar for B,C,D. Finally, F=[0,60).

The Pass/Fail policy is that you must get at least a C- to earn a "Pass".