

Math 113: Calculus I

Fall 2014

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OHs: MWF 2:30 - 4:30 or by appointment

TEXTBOOK

Calculus, 7th edition, James Stewart.

WHAT IS CALCULUS?

At its core, calculus addresses the following two questions:

1. How can we measure quantities like length, area, and volume?
2. How do quantities like these change over time?

The study of these two questions dates back to at least the ancient Egyptians, though modern calculus is usually credited to Isaac Newton and Gottfried Leibniz. Independently of one another, Newton and Leibniz answered the first question above with the concept of an *integral*. They answered the second question with the concept of a *derivative*. At first glance these two questions may seem very different. But in fact they are intimately related by one of the most profound discoveries in all of mathematics: *The Fundamental Theorem of Calculus*.

WHAT CAN I EXPECT FROM THIS COURSE?

In the first few weeks of the semester, we will study the concept of infinity. Is infinity a number? Is it some sort of divine being? By studying what mathematicians call *limits*, we will learn to talk about infinity with precision. After studying limits, we will move on to study derivatives and integrals. Our work will culminate with the Fundamental Theorem of Calculus. We will also study applications of calculus to real world phenomena.

Expect a challenging, thought-provoking, and intellectually rewarding semester. And expect a lot of work: We will cover in one semester what many high school calculus courses cover in an entire year. In addition to completing regular homework assignments, you will also sit for three midterm exams and a cumulative final exam. Some of the work you will do will go above and beyond what is covered in lectures, and lectures will *not* cover everything in the textbook. Please note: *I expect you to read the textbook on your own to fill in topics we do not cover in lecture.*

HOW TO SUCCEED IN THIS COURSE

Your primary goal is the same as mine: You want to succeed, and I want to help you succeed. Let's work together to achieve this common goal. Here is what you must do.

1. **Attend and engage in every lecture.** Turn off your phone, clear your mind from distractions, and focus on every word I say or write on the board. Take notes that you can refer back to later. If there is something you do not fully understand, either raise your hand to ask a question during lecture or talk to me outside of class.
2. **Master every detail of every homework problem.** The fact that homework only counts for 10% of your semester average is deceptive; it almost makes it seem like homework is not that important. Nothing could be further from the truth. The dirty little secret is that exams, which count for the majority of your grade, are heavily based on the homework. So on each homework problem, beyond just "doing it" and turning it in, make sure you really understand what is going on. If a similar problem were to show up on an exam and you were not allowed to refer to your notes or ask anyone for help, could you produce a perfect solution? If not, then you have not really *mastered* it. After turning in the problems, quiz yourself. Do the problems over and over until you understand them inside and out.
3. **Read the textbook on your own.** You may not have time to read every detail, and that is okay. But you should at least read the *examples* from the sections we cover. During lecture, I will try to pick examples not covered in the textbook so that you have more examples in your repertoire. The more examples you have under your belt from lecture, the textbook, and homework, the better off you will be on exams.
4. **Learn from your mistakes.** Any time points are deducted from your work, whether it be on a homework assignment, a quiz, or an exam, go back and identify your mistakes so you do not make them again. I really cannot emphasize this enough: To succeed in this course, you need to master *every* detail of *every* problem. Leave no stone unturned, especially if you missed it the first time around.
5. **Get help.** Getting help from me, your classmates, or the QSR center is essential anytime there is something you don't fully understand. I especially encourage you to come to my office hours regularly.

THE QSR CENTER

The center for quantitative and symbolic reasoning (the QSR center) offers free drop-in tutoring most days and nights on the third floor of CJ. The tutors are advanced mathematics majors who can help you with homework problems and studying. The QSR center is an excellent supplement to office hours. Check it out!

OFFICE HOURS

I will hold extensive office hours. Please stop by frequently to work on homework problems, to study for upcoming exams, or just to chat. Even if you do not have any pressing questions, the first floor of CJ (just outside my office) is a wonderful place to work, with lots of tables and chairs, soft furniture, chalk boards, and computers. Many of your classmates will be at office hours, too, making it a great environment for collaboration. You might even make some new friends!

I love office hours because they enable me to give you lots of direct, one-on-one help. However, I do not want you to become dependent on me—to master the material, you need to learn to think on your own. For this reason, I will be reluctant to give you substantial hints on homework problems unless you can first demonstrate that you have attempted to solve them yourself. For example, please do not come to me with a question like, “How do you do number 5?” A much better question would be something like, “I’ve been trying to solve number 5 using the method we learned in class, but keep getting stuck here (show me). Am I on the right track?” My goal in helping you is not to simply give you the solutions to the problems, but rather to steer you in the right direction in your thinking so that you can discover the solutions yourself. This may seem like tough love, but trust me: you will thank me come exam time when you are *required* to work all by yourself.

Most weeks, my office hours will be Mondays, Wednesdays, and Fridays from 2:30 - 4:30. I will also be available by appointment. If my office hours ever need to be delayed or cut short for some reason, I will let you know either in class or by email.

HOMEWORK AND QUIZZES

Most weeks, homework assignments will be due on Mondays and Thursdays at 5:00 PM and should be placed in the appropriate folder outside my office. I will post assignments on Blackboard under *assignments*. I encourage you to collaborate with your classmates, and of course I am always happy to help. But final write-ups of the problems must be your own work. Simply copying someone else’s work violates the honor code.

You will be marked down for sloppiness, so please take pride in your work. You must write your full first and last name on the top of your assignment along with the homework number (e.g., HW #13). You must clearly label the start of each new problem and ensure that each solution is well organized and easy to read. Please leave plenty of blank space in margins, between paragraphs, and between problems. You must write in pencil, not pen. I will not accept homework written on notebook paper with frayed edges. Multiple pages must be stapled together.

Quizzes will be given in class throughout the semester. I will not accept late homework and will not give make-up quizzes, but at the end of the semester I will drop your lowest two homework scores and lowest one quiz score.

EXAMS

There will be three midterm exams and a cumulative final exam.

- **Exam 1:** Covering sections 2.1 - 2.3 and 2.5 - 2.8, the first exam will be given on Wednesday, September 24 from 7:00 - 10:00 PM.
- **Exam 2:** Covering sections 3.1 - 3.9 and 1.6, the second exam will be given on Wednesday, October 22 from 7:00 - 10:00 PM.
- **Exam 3:** Covering sections 4.1 - 4.5, 4.7, and 4.9, the third exam will be given on Wednesday, November 19 from 7:00 - 10:00 PM.
- **Final Exam:** Covering all topics from the semester, but with slight emphasis on sections 5.1 - 5.5, 6.1, and 6.5, the final exam will be given on Wednesday, December 17 from 2:00 - 5:00 PM. Note that this date and time is the “Math and Government Common Exam” time and may differ from the date and time listed on webadvisor. The date and time of our final exam is fixed by the registrar and is not negotiable.

CALCULATORS AND COMPUTERS

You may use calculators and/or computer software as much as you like on homework assignments. But you will not be allowed to use technological devices on midterm exams or the final exam, so please use them sparingly.

HONOR CODE

I take the honor code very seriously and will report any suspicion of academic dishonesty directly to the dean of students. In addition to keeping your own nose clean, remember that the honor code requires you to report any instances of suspected cheating that you personally witness, either to me or to the dean of students.

DISABILITIES

If you have a documented disability and need academic adjustments or accommodations, please speak with me during the first week of class. All such discussions will remain confidential. You should also contact Allen Harrison in the Dean of Students Office, who coordinates services for students with disabilities.

GRADES

I will determine your semester average based on the following:

- Homework: 10%
- Quizzes: 5%
- Highest Exam Score: 25%
- Lowest Exam Score: 15%
- Middle Exam Score: 20%
- Final Exam: 25%

Cutoffs for the A, B, C, and D ranges will be approximately 90, 80, 70, and 60.