Math 252: Calculus II

The University of Oregon

CRN 23113

Winter 2023

Class Meetings: MTWF, 12:00–12:50

Instructor: Cruz Godar

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Office Hours: in the Fenton atrium — Mondays and Wednesdays at 1 PM and Fridays at 2 PM.

Learning Outcomes

A successful student can:

- Set up and evaluate formulas for Riemann sums, given the function, interval, and number of rectangles
- State and use the funamental theorem of calculus
- Evaluate integrals of polynomial and exponential functions, as well as sine and cosine.
- Evaluate integrals using substitution and integration by parts
- Use standard trig identities where appropriate as part of integral computations for some trig functions

- Interpret the area between two graphs as an integral
- Set up one-variable integrals that represent the solutions to a variety of modeling problems.
- Evaluate improper integrals
- Compute volumes of surfaces of revolution using both the disk and shell methods and recognize which method is most appropriate to a given problem
- Compute average values of functions over a closed interval
- Determine if a given function is a solution to a given differential equation
- Write down a linear differential equation that models a given situation that is described in words, typically where the rate of growth is a linear function of the amount
- Find general and particular solutions to basic separable differential equations
- Evaluate integrals using appropriate trigonometric substitutions?—if time
- Evaluate integrals using partial fraction decomposition?—if time

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Materials

Textbook: *Calculus Volume 2* by Herman and Strang. This is a free textbook which you can access online at the following link: https://assets.openstax.org/oscms-prodcms/media/documents/CalculusVolume2-OP.pdf. I recommend downloading the pdf file so that you have offline access to the textbook. You are also welcome to purchase a physical copy (they're around $30), but this is unnecessary. We will also briefly use *Calculus Volume 1* by Herman and Strang, which you can find at https://assets.openstax.org/oscms-prodcms/media/documents/Calculus_Volume_1_-_WEB_68M1Z5W.pdf.

Calculator: A scientific calculator will save you time doing simple computations. You will only be allowed to use one of the following calculators on quizzes and exams: Casio fx-260, Casio fx-300MS

(or Plus), Casio fx-300ES (or Plus), TI-30X (a, S, or IIS), TI-34. **No graphing calculators will be allowed**. The Casio fx-300MS is available from the UO Bookstore for about $13.

Logistical Stuff

Class is in person! Let's work to keep it that way. Masks are welcome but not required in the classroom. The most important thing is to stay home if you have cold or flu symptoms until you are feeling better, ideally with a negative Covid test. Make a friend *today* and keep in touch. If you need to quarantine during the quarter, they'll be your primary resource to keep up with class notes. If both of you need to quarantine, we'll handle that situation as necessary. If *I* need to quarantine, we'll follow the guidelines in the Provost's resource rubric, which is to get a substitute for both weeks.

Assignments and Grading

Your total grade in the class is determined by your attendance and participation, and your scores on the homework, quizzes, midterm exams, and the final exam, weighted in the following manner:

Reading Quizzes: 3%
In-Class Quizzes: 7%
Written Homework: 10%
WebWork: 10%
Midterm Exams: 20% each (40% total)
Final Exam: 30%

Your total grade at the end of the quarter will be rounded up to the nearest whole number. For example, a total grade of 88.2% will be rounded up to 89% and awarded a B+.

Reading Quizzes: I've decided to put in the time to provide interactive, typed lecture notes for this course — you can find them on the course website. These are there for two reasons: first, it's **much** easier to learn new material when you've seen it in some capacity before, even if you don't understand it very well the first time around. For this reason, reading the lecture notes or the textbook is required before each lecture. We'll have very short quizzes on Canvas — typically just a single multiple choice question per section — that ensure you're reading beforehand. Your lowest two reading quiz scores will be dropped.

The second purpose the notes serve is as a lecture replacement if you need to quarantine during the quarter. Between them, the textbook, and friends' class notes, you should have plenty of resources to succeed while remote.

Homework: The homework is graded out of 16 points. You'll be given a handful of textbook problems to write up careful solutions to, and you'll be graded on two criteria: 8 points for thoroughly attempting all the problems, whether or not your solution is correct, and another 8 for the correctness of your solution on a problem of my choice.

Homework will be assigned every Wednesday and due at the start of class the following Wednesday. Working with others is strongly encouraged, but the final work you submit must be your own. Your lowest two homework scores will be dropped.

All homework will be submitted via Canvas. You have two options:

- Handwrite your homework as usual and scan it, via a scanner or your smartphone. A series of pictures will **not** be accepted — only a single pdf file may be submitted. To use your smartphone for this, use the built-in document scanner in iOS (accessible through the Files app by tapping the ... menu and selecting *Scan Documents*), or the Adobe Scan app for Android.
- Typeset your homework. All the course documents (like this syllabus) are written in a language called LaTeX which compiles to the clean-looking pdf file you see. Although it takes an hour

or two to become comfortable with, LaTeX is used by people in nearly every STEM-related field, and learning it now will give you a major headstart. To get started, make an account at Overleaf and create a new project. You can type as usual, and to render math expressions, surround them in dollar signs — for example, $\frac{1}{2}$ will render as $\frac{1}{2}$. I'm more than happy to help with any difficulties you run into here.

WebWork: We have WebWork due every week on Wednesday, covering the previous week's material. You can access the WebWork through the course website. Your lowest two WebWorks will be dropped.

Quizzes: We'll have a quiz every week on Wednesday, during the last 20 minutes of class. The purpose of these is to practice working in a timed environment before the exams, and serve more as a barometer for how well you're prepared for the exams than an evaluation of your ability at the time. If you aren't getting the scores you'd like on the quizzes, **reach out for help** before the exam. Your lowest two quiz scores will be dropped.

Exams: Our class will have two midterms on the Wednesdays of weeks 4 and 8, taking up 50 minutes of class time. Each midterm will cover multiple sections of material, and the final exam will cover all of the sections covered in the course. You must take the final to pass the course. The final will replace the lower of your midterms if it is higher.

- Midterm 1: Wednesday, February 1
- Midterm 2: Wednesday, March 1
- Final: Monday, March 20 at 10:15 AM

A recent policy change at UO means I am no longer allowed to take reasons for absences into account when determining accommodations, with the exceptions of the AEC, religious exemptions, and university-sponsored events like sports. Outside of these categories, every accommodation must be available to everyone, regardless of circumstance. To attempt to walk the line between strict policies that are unfair to students with legitimate excuses and relaxed policies that are exploitable, I'm dropping double the number of dropped quizzes and reading quizzes I typically do, and also replacing the lowest midterm with the final if it helps. This is to counterbalance the fact that no

late or make-up work will be accepted without an official exception for one of the three categories listed previously. The goal is to allow for up to about two weeks of missed class due to illness or other unexpected circumstance, but these policies apply to everyone equally.

Course Schedule

This schedule is tentative, and may change slightly throughout the quarter.

Week	Material
1	0, 1
2	2, 3
3	4, 5
4	6
5	7, 8
6	9
7	10, 11
8	12
9	13, 14
10	15, 16

Other Things

Accessibility: For those of you who are currently registered with Accessible Education Center for a documented disability, please present your paperwork to me during the first week of the term (or earlier) so that we can design a plan for you. Those of you with a disability, or who think they might have one, but are not registered with AEC should contact them as soon as possible. It is

much more likely that measures can be taken to provide adequate special accommodation if the organization is done through AEC. Please let me know if you need additional accommodations.

Prohibited Discrimination and Harassment Reporting: I am a student-directed employee. For information about my reporting obligations as an employee, please see Employee Reporting Obligations. Students experiencing any form of prohibited discrimination or harassment, including sex or gender based violence, may seek information on safe.uoregon.edu, respect.uoregon.edu, titleix.uoregon.edu, or aaeo.uoregon.edu or contact the non-confidential Title IX office (541-346-8136), AAEO office (541-346-3123), or Dean of Students offices (541-346-3216), or call the 24-7 hotline 541-346-SAFE for help. I am also a mandatory reporter of child abuse. Please find more information at Mandatory Reporting of Child Abuse and Neglect.

Conduct: This university exists for your benefit. If you believe something is not as it should be, don't hesitate to let me know.

And as you should hold the university to a high standard, I will hold all of you to one in return. Academic dishonesty, including looking at other students' quizzes or tests or using any materials other than those allowed during a testing period, submitting others' work as your own, or altering returned work and resubmitting it, will be met with the strictest disciplinary action possible.

A word on learning: Math is not a subject that is learned passively. It is one thing to understand examples from lecture and another thing entirely to work through problems by yourself. Students who come to lecture expecting it to be enough on its own to pass the tests — and therefore don't put much or any effort into the homework — typically end up with very poor class grades. For your own benefit, it's crucial to stay on top of the homework, to follow along with lecture, and to seek help — from a friend, from my office hours, from the textbook, or from a tutor — when that becomes difficult. In the same vein, it's critical that if you're struggling, you reach out before large assignments, not after. I want to help however I can, but if a test has already been graded and handed back, there's usually nothing I can do.