

Math 252: Calculus II

Autumn 2022, CRN 12506

Instructor: Corey Brooke
Office: 312 Fenton Hall
Email: cbrooke@uoregon.edu
Phone: 541-346-4737 (not reliable)

Office Hours:
Tuesday 10am-11am,
Thursday 2-4pm,
or by appointment

1. COURSE OVERVIEW

Class Meetings: 2 - 2:50pm, MTWF, 306 University Hall

Text: *OpenSTAX Calculus Volume I-II*. Electronic editions of these texts are available for free at the links below. We will use Volume 1 only in the first week when discussing antiderivatives.

<https://openstax.org/details/books/calculus-volume-1>

<https://openstax.org/details/books/calculus-volume-2>

NOT Required: A calculator. Calculators will not even be allowed for exams, so please don't feel obligated to buy an expensive calculator for this class.

Prerequisite Knowledge: The pre-requisite for Math 252 is Math 251 or a satisfactory placement test score. You should be familiar and relatively comfortable with the following:

- a catalogue of basic functions (polynomial, absolute value, root, rational, exponential, logarithmic, and trigonometric functions);
- function composition;
- inverse functions;
- how to differentiate functions;
- what differentiation is useful for;
- graphing functions using techniques from precalculus and calculus I.

Course Format: I will usually lecture for 40 minutes and incorporate quizzes and individual or group activities in the remaining 15 minutes. Attendance is not required, but the course is designed around active learning practices, so I encourage you to come each day ready to engage with your peers. You will reinforce your knowledge of course material by reading the textbook (ideally before lectures) and working on homework; usually, 12 hours per week is an appropriate amount of time to spend on the course outside of class time, though this will vary among students. At some point this term, you will schedule a meeting with me to present a solution to a calculus problem that is slightly more involved than the homework problems. Other assessments include two midterm exams and a final exam.

Course Goals: You will be able to model and solve a wide class of problems that can be answered by calculating an appropriate integral. Specifically, you will be able to do the following:

- (1) set up and evaluate formulas for Riemann sums, given the function, interval, and number of rectangles;
- (2) state and use the fundamental theorem of calculus.

- (3) evaluate integrals of polynomials, exponential functions, and the trigonometric functions sine and cosine;
- (4) evaluate integrals using substitution and integration by parts;
- (5) use standard trig identities where appropriate as part of integral computations for some trig functions;
- (6) interpret the area between two graphs as an integral;
- (7) interpret an integral as a signed area;
- (8) set up one-variable integrals that represent the solutions to a variety of modeling problems;
- (9) evaluate improper integrals;
- (10) compute volumes of surfaces of revolution using both the disk and shell methods, and recognize which method is most appropriate to a given problem;
- (11) compute average values of functions over a closed interval;
- (12) determine if a given function is a solution to a given differential equation;
- (13) write down a linear differential equation that models a given situation that is described in words;
- (14) find general and particular solutions to basic separable differential equations;
- (15) compute probabilities and expected values given a probability distribution.

Class Culture: My personal belief is that the main purpose of mathematics is to empower people and enrich their relationship to the world around them as well as their understanding of themselves. My goal as instructor is to support you as you learn calculus this term. I ask that your goals include engaging meaningfully with your classmates and the material. Here are some examples of how you can do this:

- Be honest with yourself, me, and your peers about what is really challenging. This includes asking questions.
- Compliment or encourage your peers when they explain something clearly or when they make progress, and do the same to yourself.
- Come to office hours with questions and be ready to work with other students there.
- Do not distract yourself or others with technology during class. If you want to check your phone, please do so in the hallway.
- Talk to me, my supervisor Mike Price (mprice@uoregon.edu), or a university official if you experience or witness racism, sexism, ableism, homophobia, transphobia, or another form of discrimination in the classroom. See the “Reporting Obligations” section for more information. Also talk to any of these people if you experience or witness other forms of disrespect in the classroom.
- Always stay home when sick! Just email me to get caught up.

Seeking Help: Most students will find at least some moments in this class challenging. If you find yourself confused, do not ignore the problem or simply try to tread water. Please review your notes, read the book, and then visit my office hours with some prepared questions (e.g. specific problems that are difficult to you or examples that you do not understand). Outside of my regular office hours,

I am eager to schedule appointments if you email me. Students who regularly need assistance may prefer to find a tutor through the Teaching and Learning Center of Math Library Reading Room, but I urge you also to let me know how things are going.

2. ASSIGNMENTS AND ASSESSMENTS

Grading: I will weight course grades¹ according to the following scheme.

Quizzes	0%
Worksheets	10%
Presentation	10%
Homework	25%
Midterm Exams (2)	15% each
Final Exam	25%

Grades are assigned as follows: 90-100% is an A, 80-89.9% is a B, 70-79.9% is a C, 60-69.9% is a D, and 59.9% and below is an F. A “plus” is awarded for the top two percentage points in each range, and a “minus” for the bottom two percentage points (e.g. B+ means 88-89.9%, and C- means 70-72%). For a grade of A+, a student must also consistently participate in class.

I do not curve grades on individual assignments or assessments but often curve overall grades at the end of the term. I will never adjust your grade downward when curving.

Homework: All homework this term will be assigned through WeBWorK (there is a link on Canvas). Each class day, a few problems will become available based on the material we’ve covered, and you have a week to complete each assignment. You will learn best if you work on a few problems every day. Late work is accepted with a 20% penalty per day. If you ever want an extension, please reach out to me: I have a “no questions asked” policy for one-day extensions on homework and am happy to be more flexible in many circumstances.

Quizzes: There will be in-class quizzes throughout the term. Problems on these assessments will resemble those on the homework sets and exams. I will score and give feedback on your quizzes, but your quiz grades will not be entered into Canvas and do NOT affect your final course grade. The purpose of these assessments is to help you track your progress in the course and give you practice working in an exam setting.

Worksheets: We will periodically do worksheets or other in-class group-work activities. These will be graded for participation and completion only. If you are absent and miss a worksheet, you can access it via Canvas (under the Files tab) and earn credit by having a conversation with me about the worksheet problems during office hours or over email.

¹A student who achieves adjusted grades of D or worse on all of the exams may be eligible for a maximum grade of D.

Exams: Twice during the term and again at the end of the term I will test your understanding of the most essential techniques covered in class. All exams, including the final, will be cumulative.

3. EXAM RUBRICS

Some exam problems are true/false, others are short answer, and a few are long answer. For true/false problems, you do not need to provide any explanations, and there is no partial credit. For short answer questions, you perform a straightforward calculation (e.g. computing an integral) and show work, but the work is likely minimal. Short answer problems are worth 3 points, and the rubric is as below.

3	The student evaluates the integral correctly. The work is well-organized and thorough.
2	The student makes some errors evaluating the integral. The work is complete but might be difficult to follow.
1	The student makes major errors evaluating the integral. The work is disorganized or largely incomplete.
0	The student makes no reasonable progress solving the problem.

Long answer problems are slightly more involved and relate to applications of the calculus material. Long answer problems are worth 5 points, graded according to a rubric similar to the one below. I give half points in borderline cases.

5	The student sets up an appropriate integral correctly and evaluates the integral correctly. The student interprets their answer, using correct units if applicable. The work is organized, and any reasoning is easy to follow.
4	The student sets up an appropriate integral with minor errors or makes minor errors evaluating the integral. The student interprets their answer but may miss units. The work is largely organized, with mostly correct reasoning.
3	The student sets up an integral with major errors or makes major errors evaluating the integral. The student might misinterpret their answer. The work and reasoning are sometimes difficult to follow.
2	The student sets up an integral with major errors and makes major errors evaluating the integral. The student fails to interpret their answer or misinterprets it. The work and reasoning are difficult to follow or seriously flawed.
1	The student sets up an integral with major errors and makes major errors evaluating the integral. The work is largely incomplete.
0	The student does not set up an integral relevant to the problem.

4. TENTATIVE COURSE SCHEDULE

The following schedule reflects our goals this term. In the event of major changes to the schedule, I will update this syllabus on Canvas and send an announcement to the class.

Week	Date	Topic	Reading
1	9/27-9/30	antiderivatives, integrals	1.1-1.2
2	10/3-10/7	definite integrals, FTC	1.3-1.5
3	10/10-10/14	integrating logs and exponentials, integration by parts	1.6, 3.1
4	10/17-10/21	improper integrals, probability, Midterm 1 on Friday	3.7
5	10/24-10/28	more probability, areas between two curves, average values	
6	10/31-11/4	volumes	2.2-2.3
7	11/7-11/11	physics applications	2.5-2.6
8	11/14-11/18	differential equations, Midterm 2 on Friday	4.1-4.2
9	11/21-11/23	separable differential equations	4.3
10	11/28-12/2	exponential growth and decay	2.8
11	Thurs., 12/8	Final Exam, 2:45-4:45pm	

5. UNIVERSITY POLICIES

Attendance: I do not take attendance, and students who miss class need only get in touch with me to find out what they missed and make up worksheets, if applicable. If you miss a midterm exam, the other midterm will become worth 22.5% of your course grade, and the final exam will become worth 32.5% of your course grade (and the missed midterm will not count against you). There are no make-ups for the final exam; in situations where you must miss the final exam because of a circumstance outside your control (e.g. illness, court date, family death), email me, and I will award you a grade of Incomplete until you are able to take the final exam.

Accessibility: For those of you who are currently registered with Accessible Education Center for a documented disability, please reach out to me during the first week of the term so that we can design a plan to accommodate you.

Reporting Obligations: As an “assisting employee” of UO, I have the following reporting obligations if you inform me of prohibited discrimination:

Assisting Employees should not share disclosures of prohibited discrimination with OICRC unless the information conveyed suggests a threat to the health or safety of any person. However, Assisting Employees should explicitly ask the person making the disclosure whether they want assistance with submitting a report to OICRC offer and are required to provide the person making the disclosure with information about support resources. If a student discloses

sex or gender-based harassment or violence, after you have met with the student, please take a moment to complete the Assisting Employee Checklist to document your conversation. Please do not record the student's name on the checklist.

Students experiencing sex or gender-based discrimination, harassment or violence should call the 24-7 hotline 541-346- SAFE [7244] or visit safe.uoregon.edu for help. Students experiencing all forms of prohibited discrimination or harassment may contact the Dean of Students Office at 541-346-3216 or the non-confidential Title IX Coordinator/OICRC at 541-346-3123. More resources are listed at:

<https://investigations.uoregon.edu/how-get-support>.

Academic Misconduct: The University Student Conduct Code, available at

<https://conduct.uoregon.edu>,

defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. Students should properly acknowledge and document all sources of information and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at

<https://researchguides.uoregon.edu/citing-plagiarism>.

Emergency Policies: For university policies on weather, fires, or active shooters, please visit the link below.

<https://safety.uoregon.edu/>