

Calculus I

Professor:

Dr. Joanna Bieri
joanna_bieri@redlands.edu

Class:

Fall 2020
Monday, Wednesday, Friday 1-2:20pm

Office Hours:

M,W,F 12:30-1pm and other times by appointment.

Welcome to Calculus I

My goal is to help each and every student achieve their personal learning goals for this class. I value a diversity of opinions, learning approaches, cultural backgrounds, abilities, and ideas in my class. Classes, lectures, and group interactions should be a safe learning space where each member of the community feels valued, listened to, and respected. It is the responsibility of each of us to ensure that we are lifting up our peers, breaking free from old biases, reaching across cultural, socioeconomic, and other boundaries, and supporting each other. If at any time in the class you feel that there is something that could be done to improve your learning or your experience please let me know. I am here to lift you up and help you learn!

Please take a minute and think about what you would like to achieve by enrolling in Calculus I!

About This Course

This course is an introduction to single variable calculus. We will cover a wide range of topics including functions and their graphs, successive approximation and limits, local linearity and differentiation, applications of differentiation to graphing and optimization, the definite integral, antiderivatives, and differential equations.

Course Learning Objectives

We will cover Chapters 1-4 in the book and a few other topics. By the end of this course, for each topic covered, you should:

1. Understand the concepts and techniques, not just memorize formulas.
2. Be able to communicate your mathematical understanding to others.
3. Use the techniques learned in class to model real life problems.
4. Improve your problem solving abilities.
5. Fall in love with your old friend mathematics!

Technology

Homework and announcements will be posted on the class website and classes will take place on Microsoft Teams so make sure you have access to a device that can connect to the internet and check daily for updates. You will also need to be able to take scans of handwritten work, make short videos using a device with a camera, and interact with class by streaming videos and attending online lectures. Please let me know if this is a problem and I can help make sure you have access to a working computer or that accommodations are made for your situation.

Text Books

Please ensure that you have full-time access to the required texts for the duration of the course.

- REQUIRED Matthew Beolkins *Active Calculus* - <https://activecalculus.org/single/book-1.html> (Free Online) ISBN 978-1724458322
- OPTIONAL Hughes-Hallett *Calculus, Single and Multivariable* (6th Edition) ISBN-13: 978-0470888537
- Other texts and articles made available via our course website.

Classwork

Consistent attendance and participation are crucial to your success in the class. Please read the following carefully:

- i. **Pre-Class Preparation:** Lectures will be posted every Monday, Wednesday, and Friday on our class website along with a homework assignment that is intended to help you understand the material. It is your job to watch the lectures, take notes, do the chapter activities in the Active Calculus book, attempt the exercises, and formulate some questions before class begins. You might also do some research to enhance your understanding of the material. Your goal is to prepare for the class period where you will work with your group to get your questions answered and finish the book exercises. Please post resources you find and your questions to your group Teams page.

ii **In-Class Participation:** Classes will take place on Monday, Wednesday, and Friday on Microsoft Teams. You are expected to come to class ready to participate fully and to improve the learning of your group. Each class you will begin by meeting on your group channel. You will collaborate on creating a list of questions that your group plans to answer and goals for the class time. Joanna will start to check in with each group after the first 15 minutes of class. You should use this time to work together on the homework exercises and make sure everyone understands all the problems.

iii **Video Check In and Survey:** Most Mondays you will submit a video that demonstrates your work and your gained knowledge for the previous week. Due by 11:59pm.

- Make a short (less than 6 minutes) video that presents one of the exercises from this weeks homework. This will be posted on our Teams site so it can help your classmates learn the content.
- Respond to the following questions on the Google survey:
 - What is one piece of Calculus knowledge that you are proud of gaining this week?
 - We all struggle with mathematics even when we love it. What is one piece of Calculus knowledge that you struggled with or if you didn't struggle what is one inquiry that you made to expand your love of calculus?
 - How did you contribute to your group?
 - What goals do you have for yourself in the next week of class?

iv. **Midterm Exams:**

We will have **four** exams. These will be taken during our normal class times. The exam will be posted on Moodle, you will write out your solutions on your own paper, and submit a picture of your work.

1. Exam 1 - Limits and Definition of Derivatives (Chapter 1) - Friday September 18
2. Exam 2 - Derivatives of Functions (Chapter 2) - Friday October 16
3. Exam 3 - Applications of the Derivative (Chapters 3) - Friday November 6
4. Exam 4 - Riemann Sums and Integrals (Chapter 4) - Monday November 23

v. **Final Reflection:**

We will not have a cumulative final exam, but I would like for each student to complete a final reflection of the class. This should be a one page essay about what you believe to be your biggest accomplishments in the class. How have you grown mathematically or as a person because of the challenges you faced in Calculus I (More instructions will be handed out on the last day of class). It will count toward your video check in and survey grade.

Evaluation Procedures

There are seven elements of the course which contribute to your overall grade, as follows:

Pre-Class Preparation	20 %
In-Class Participation	20 %
Video Check-in and Survey	20 %
Exam 1	10 %
Exam 2	10 %
Exam 3	10 %
Exam 4	10 %

How to Succeed in this Class

All work for the course will be graded according following criteria.

- Students can demonstrate pre-class preparation by contributing work to your group before class for the topic has begun. This might include: posting questions to your group discussion, saving your daily homework answers on Teams for your group to use, sharing your class notes on Teams

for your group to look at, submitting links to the course website that point to helpful resources, or giving additional mini video lectures for your group on things you have learned.

- Students can demonstrate in-class participation by attending every online class and being actively involved in the group discussion during class time. For some this will be active speaking, for others it will be posting in the chat, for others it will be managing the collaborative whiteboards or documents. There are lots of ways to participate, let me know how you best like to contribute!
- Videos will be posted to the Teams Site and graded for 10 points:
 - 2 points for preparation and timing. Don't just wing your video, practice a few times so you are not stumbling over your words. Make sure your video is not longer than about 6 minutes.
 - 2 points for submitting the video on time.
 - 2 points for a correct solution with all the work.
 - 2 points for demonstrating your understanding. This means that you are saying more than just what you did, but also WHY you did it.
 - 1 point for correctly labeling the video: You should write a summary of what problem you are solving when you post your video.
 - 1 point for also completing the survey.
- Exams will be graded based on a rubric. You must show all your work and explain your steps to get full credit.

Grading Scales:

4.0	95-100%
3.7	90-94%
3.3	87-89%
3.0	83-86%
2.7	80-82%
2.3	77-79%
2.0	73-76%
1.7	70-72%
1.3	67-69%
1.0	63-66%
0.7	60-62%

Please note: According to the University Course Catalog (p. 13) 3.7 and 4.0 are reserved for “outstanding” work; 3.3 and 3.0 are both defined as “excellent,” not mediocre.

Course Policies

Reaching Joanna

The most reliable way to reach me is by email. Please note that my normal working hours are 9 a.m. to 5 p.m., Monday to Friday. I do not respond to emails after 5 p.m. or on weekends, except in an emergency.

Academic Honesty

This syllabus assumes that all students have read and are familiar with the University of Redlands’ policies on “Academic Honesty,” as is written in the 2016-2018 Catalog. Any case of academic dishonesty will be processed through the official procedures.

Accommodations

If a student has a disability that qualified for accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act,

he/she/they should contact Academic Success & Disability Services (ASDS). ASDS is located on the ground floor of the Armacost Library across from Human Resources and down the hall from the Jones Computer Center. The primary contact person is:

Amy Wilms

Assistant Dean of Academics and Student Life:

Phone: (909) 748-8069

amy_wilmsredlands.edu.

Discrimination, Harassment, Sexual Misconduct and Retaliation

These policy statements support the University’s commitments to equality of opportunity and maintaining an academic environment and workplace that is free from unlawful discrimination, harassment, sexual misconduct, and retaliation. Each person to whom this policy applies shares a responsibility for upholding and enforcing this policy.

- A. No Discrimination. The University prohibits and will not tolerate unlawful discrimination on the basis of age, color, race, ethnicity, national origin, ancestry, sex, marital status, pregnancy, status as a complaining party of domestic violence, sexual orientation, gender, gender identity or expression, physical or mental disability, genetic information, religion/creed, citizenship status (except to comply with legal requirements for employment), military/veteran status, or any other characteristic protected by law.
- B. No Harassment. The University prohibits and will not tolerate unlawful harassment on the basis of the characteristics identified above.

- C. No Sexual Misconduct. The University prohibits and will not tolerate sexual misconduct. Redlands is committed to fostering a safe, productive learning environment. Title IX and our school policy prohibit discrimination on the basis of sex, which regards sexual misconduct – including harassment, domestic and dating violence, sexual assault, and stalking. We understand that sexual violence can undermine students’ academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. Confidential support may be obtained from the Chaplain’s Office and Counseling Center. Reporting should be done through the Title IX Office – contact listed below.
- D. No Retaliation. The University prohibits and will not tolerate any retaliation against any person who, in good faith, complains about discrimination, harassment, or sexual misconduct. Similarly, the University prohibits and will not tolerate any retaliation against any person who, in good faith, demonstrates opposition to, or participates in an investigation of, alleged discrimination, harassment, or sexual misconduct.

The person to contact with Title IX Concerns or any concerns about experiences of discrimination:

Erica Moorer, Deputy Title IX Coordinator
Title IX Office, Hunsaker Center 220
Phone: (909) 748-8916
erica_moorerredlands.edu

Course Schedule

Schedule is subject to change as we progress through the semester. You will be notified of any changes in class.

Calculus 1 - CLASS SCHEDULE

		Before Class			During Class		After Class
DATE	DAY	Watch and Learn	Read	Practice	Class Time	Assigned	Due 11:59pm
08/26/20	Wednesday			Algebra Review	Welcome and Review	Make a short video introducing yourself to the class. What is your favorite function and why?	Post sample video to Teams.
08/28/20	Friday	Measuring Velocity	1.1	Activities 1.1	Exercises 1.1	Video 1	
08/31/20	Monday	Limits	1.2	Activities 1.2	Exercises 1.2		Video 1 Due
09/02/20	Wednesday	Derivative at a Point	1.3	Activities 1.3	Exercises 1.3		
09/04/20	Friday	The Derivative function	1.4	Activities 1.4	Exercises 1.4	Video 2	
09/07/20	Monday	Interpretations of the Derivative	1.5	Activities 1.5	Exercises 1.5		Video 2 Due
09/09/20	Wednesday	The Second Derivative	1.6	Activities 1.6	Exercises 1.6		
09/11/20	Friday	Limits, Continuity, and Differentiability	1.7	Activities 1.7	Exercises 1.7	Video 3	
09/14/20	Monday	Tangent Line Approximation	1.8	Activities 1.8	Exercises 1.8		Video 3 Due
09/16/20	Wednesday	Review Introduction to Derivatives	Review		Review		
09/18/20	Friday				Exam 1		
09/21/20	Monday	Elementary Derivative Rules	2.1	Activities 2.1	Exercises 2.1		
09/23/20	Wednesday	The Sine and Cosine Functions	2.2	Activities 2.2	Exercises 2.2		
09/25/20	Friday	The Product and Quotient Rules	2.3	Activities 2.3	Exercises 2.3	Video 4	
09/28/20	Monday				NO CLASS		Video 4 Due
09/30/20	Wednesday	Derivatives of other Trigonometric Functions	2.4	Activities 2.4	Exercises 2.4		

10/02/20	Friday	The Chain Rule	2.5	Activities 2.5	Exercises 2.5	Video 5	
10/05/20	Monday	Review of Derivative Rules	Review		Review		Video 5 Due
10/07/20	Wednesday	Inverse Functions	2.6	Activities 2.6	Exercises 2.6		
10/09/20	Friday	Implicit Functions	2.7	Activities 2.7	Exercises 2.7	Video 6	
10/12/20	Monday	Using Derivatives to Evaluate Limits	2.8	Activities 2.8	Exercises 2.8		Video 6 Due
10/14/20	Wednesday	Review Derivative Concepts	Review		Review		
10/16/20	Friday				Exam 2		
10/19/20	Monday	Using Derivatives to identify extreme values	3.1	Activities 3.1	Exercises 3.1		
10/21/20	Wednesday	Using Derivatives to identify extreme values	3.1	Activities 3.2	Exercises 3.2		
10/23/20	Friday	Describing families of functions	3.2	Activities 3.3	Exercises 3.3	Video 7	
10/26/20	Monday	Global Optimization	3.3	Activities 3.4	Exercises 3.4		Video 7 Due
10/28/20	Wednesday	Review Optimization	Review		Review		
10/30/20	Friday	Applied Optimization	3.4	Activities 3.4	Exercises 3.4	Video 8	
11/02/20	Monday	Related Rates	3.5	Activities 3.5	Exercises 3.5		Video 8 Due
11/04/20	Wednesday	Review Applied Problems	Review		Review		
11/06/20	Friday				Exam 3		
11/09/20	Monday	Determining distance traveled from Velocity	4.1	Activities 4.1	Exercises 4.1		
11/11/20	Wednesday	Riemann Sums	4.2	Activities 4.2	Exercises 4.2		
11/13/20	Friday	The Definite Integral	4.3	Activities 4.3	Exercises 4.3	Video 9	

11/16/20	Monday	Properties of the Definite Integral	4.3	Activities 4.4	Exercises 4.4		Video 9 Due
11/18/20	Wednesday	The Fundamental Theorem of Calculus	4.4	Activities 4.5	Exercises 4.5		
11/20/20	Friday	An introduction to Differential Equations	7.1	Activities 7.1	Exercises 7.1	Video 10	
11/23/20	Monday				Exam 4		Video 10 Due
11/25/20	Wednesday	Thanksgiving					
11/27/20	Friday	Thanksgiving					
11/30/20	Monday	Study for Final Exam			Last Day Check In		
12/02/20	Wednesday	NO FINAL EXAM - Final Reflections Due 11:59pm					