

Math 11A: Calculus with Applications

MWF 9:00-11:30am PDT, Online

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(she/her/hers)

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COURSE OVERVIEW

The main goal in this course is to understand what a derivative is, how to calculate it, and how it relates to the world around us and the science that we encounter in everyday life or in the lab. This course will be taught online with a mixture of pre-recorded lectures and live zoom lectures. For our **first week, we will have pre-recorded lectures** and **weeks 2-5 will be taught in a synchronous zoom format**. While weeks 2-5 will be offered synchronously, I will also upload all of the recordings to Yuja so that lectures can be watched or rewatched at any time.

COMMUNICATION

Office Hours with Sophie: **Tuesdays 10:00-11:00am PDT** and **Thursdays 3:00-4:00pm PDT** in my [zoom personal meeting room](#). The meeting ID is 349 425 2988 and the passcode is 556256.

Office hours with TA Brandon Owens (browens@ucsc.edu): **Thursdays 9:00-11:00am PDT** via [zoom](#)

Project work time with TA Brandon Owens: **Tuesdays 9:00-10:00am PDT** in weeks 2, 3, and 4

I may also be available by appointment if these times do not work for you. Summer is a busy time for us all, so feel free to reach out and we can try to schedule a time that works for both of us.

You can contact me anytime via **email** (ausaiken@ucsc.edu). I will do my best to respond within 24 hours during the work week, so if you need a quick response, it will be best to reach out to me Monday through Thursday. In the subject line of your email please include “math 11a” so that I know right away it is an email regarding class. You can also contact me via the **canvas inbox** for this course.

We will also be using **Ed Discussion** on Canvas. This is a great place for you to post questions and receive hints/advice from your peers. I will check Ed Discussion once a day to answer any questions that you all were not able to answer for each other. When posting responses to questions, remember that everyone is trying their best to learn a new subject.

Try to post hints rather than full answers so that everyone has a chance to work on the problems, and remember to use kind and respectful language.

LEARNING OUTCOMES

Throughout this course, students will learn to:

1. *break down* a word problem/physical system in order to *formulate* the problem as an equation involving derivatives
2. *appreciate* how math can be a tool for you as a scientist in other disciplines and develop critical thinking skills to *identify* when different tools will be applicable
3. build confidence in *utilizing* and *sharing* mathematical ideas
4. develop problem solving strategies that can be applied across disciplines and outside of academia

Content specific objectives:

5. *evaluate* limits of functions and *identify* the physical meaning of the end behavior of the function
6. *understand* and be able to *apply* the Intermediate Value Theorem and Squeeze Theorem for continuous functions
7. *understand* and *apply* the limit definition of a derivative
8. *examine* a derivative to *deduce* its physical meaning as an instantaneous rate of change
9. be able to *identify* the necessary derivative rule and *apply* it to complete the calculation
10. *Define* linear approximation and Taylor expansion and *describe* why it is useful to approximate a more complicated function with a linear one
11. *understand* L'Hopital's rule and use it to *predict* the relative growth rates of multiple functions
12. *define* antiderivative
13. *define* a system of differential equations and *explain* what it models about a physical system

PREREQUISITES/COREQUISITES

If you would like to review the concepts from Math 3, check out Paul's Online Math Notes for [Algebra](#) and his chapter reviewing [prerequisites for Calculus 1](#). Focus on reviewing inverse functions, trig functions, exponential and log functions, and all of their graphs.

REQUIRED MATERIALS, TEXTBOOKS AND TECHNOLOGY

There are no required textbooks for this course. I will be referencing *Biocalculus* by James Stewart and Troy Day. You can find a copy under the "Resources" header in the

“Introduction to the course” module on canvas. This may be a good resource if you are ever looking for more in depth or rephrased information.

ASSIGNMENTS & ASSESSMENT

Your grade for this course will be built from the following assignments:

- Homework - 30%
 - Edfinity practice problems associated with each lecture - 15%
 - Written weekly exercises submitted via Gradescope- 15%
- Lecture Reflection Padlet Posts and Connection Journal entries- 10%
- Project - 30%
 - Draft 1 - 5%
 - Draft 2 - 5%
 - Final - 20%
- Assessments - 30%
 - Midterm (Friday, August 18th 9-11:30am) - 15%
 - Final (Friday, September 1st 9-11:30am) - 15%

Edfinity is an online homework platform that will allow you to receive instant feedback on more computational problems. This resource costs \$25, and you will be prompted to purchase it when you open the first edfinity assignment through canvas.

GRADING POLICY

Assignment deadlines are created so that you can cover the needed material at a steady pace throughout the course and so that I can give you feedback promptly. Assignments will be graded and returned with feedback (you will only receive feedback for your written assignments, and feedback can be viewed on your submission in Gradescope) within 1 week of submission. If there is a time when you cannot meet a deadline, reach out to me so that we can create a revised timeline for submission and feedback.

For help viewing grades and feedback in Gradescope, please watch [this short video](#).

For the **project**, there is a grading rubric which you can access [here](#) and use as a guide as you complete the project. If you have any questions about the rubric or what I am looking for in this project, please contact me so that we can both have a clear understanding of the expectations.

The **Midterm and Final** are meant to assess your recall and understanding of major concepts from the course as well as your ability to use these concepts to analyze physical systems/scenarios. It is important to me that you master this knowledge by the end of the course, not by a specific date during the course. As such, if you score higher on the final than the midterm, I will replace your midterm grade with the higher final grade.

After the midterm exam, you will be allowed to submit **corrections/revisions** in order to receive up to 10% credit back on your exam (not exceeding 100%). You can make a **Flip video** (guidance on how to use Flip [here](#)) where you present your test corrections. You will only receive credit if you have corrected **every problem** where you did not receive full

credit and your video explanation shows **understanding** of the revised solution. I will respond to your correction video within 48 hours, and you can resubmit correction videos as many times as you want within 1 week of receiving your graded exam (i.e. correction videos will be accepted until 11:59pm PDT Monday, August 28th)

STUDENT FEEDBACK

At the end of the quarter you will be asked to complete a Student Experience of Teaching survey for this course. SETs provide an opportunity for you to give valuable feedback on your learning that is honest and constructive. This anonymous feedback will help me consider modifications to the course that will help future students learn more effectively. I encourage you to skim through *CITL's Guide to Giving Useful Feedback to Instructors and TAs* before completing your SET survey.

Daily Schedule

Please refer to the schedule below for important dates and assignment due dates throughout the session. Note that the schedule may be adjusted depending on the pace we set during the first few weeks.

Week	Monday	Wednesday	Friday
One learning objectives 5,6,7	July 31 padlet post connection journal	Aug 2 padlet post connection journal	Aug 4 padlet post connection journal
Two learning objectives 8,9	Aug 7 Edfinity HW 1 due Written HW 1 due padlet post connection journal	Aug 9 padlet post connection journal	Aug 11 draft 1 of Project due padlet post connection journal
Three learning objectives 8,9	Aug 14 Edfinity HW 2 due Written HW 2 due padlet post connection journal	Aug 16 padlet post connection journal	Aug 18 Midterm (covering content from weeks 1-2) Draft 2 of project due
Four	Aug 21	Aug 23	Aug 25

learning objectives 10,11,12,13	Edfinity HW 3 due Written HW 3 due padlet post connection journal	padlet post connection journal	Final draft of project due padlet post connection journal
Five learning objectives: review material and fill in gaps	Aug 28 Edfinity HW 4 due Written HW 4 due padlet post connection journal Last day to submit Midterm corrections	Aug 30 padlet post connection journal	Sept 1 Final (covering content from weeks 1-5)

ACCESSIBILITY

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please affiliate with the DRC. I encourage all students to benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu. For students already affiliated, make sure that you have requested Academic Access Letters, where you intend to use accommodations. You can also request to meet privately with me during my office hours or by appointment, as soon as possible. I would like us to discuss how we can implement your accommodations in this course to ensure your access and full engagement in this course.

You can find more examples of accessibility and inclusivity statements in [CITL's Sample Syllabus Language](#).

TITLE IX/CARE ADVISORY

You are encouraged to include a Title IX and CARE (Campus Advocacy, Resources & Education) statement in your syllabus to address your reporting responsibilities and to provide students with information on resources and support services. You are welcome to use the text below or alter it to suit your own needs. However, at a minimum, it is recommended that you inform students of the following: (1) University policy requires you to report Title IX misconduct, and (2) the CARE office offers confidential support. This sample statement was created in collaboration with the UC Santa Cruz Title IX Office and leadership at CARE.

UC Santa Cruz is committed to providing a safe learning environment that is free of all forms of gender discrimination and sexual harassment, which are explicitly prohibited under Title IX. If you have experienced any form of sexual harassment, sexual assault, domestic violence, dating violence, or stalking, know that you are not alone. The Title IX Office, the Campus Advocacy, Resources & Education (CARE) office, and Counseling & Psychological Services (CAPS) are all resources that you can rely on for support.

Please be aware that if you tell me about a situation involving Title IX misconduct, I am required to share this information with the Title IX Coordinator. This reporting responsibility also applies to course TAs and tutors (as well to all UCSC employees who are not designated as “confidential” employees, which is a special designation granted to counselors and CARE advocates). Although I have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. The goal is to make sure that you are aware of the range of options available to you and that you have access to the resources you need.

Confidential resources are available through [CARE](#). Confidentiality means CARE advocates will not share any information with Title IX, the police, parents, or anyone else without explicit permission. CARE advocates are trained to support you in understanding your rights and options, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more. You can contact CARE at (831) 502-2273 or care@ucsc.edu.

In addition to CARE, these resources are available to you:

- If you need help figuring out what resources you or someone else might need, visit the [Sexual Violence Prevention & Response \(SAFE\) website](#), which provides information and resources for different situations.
- [Counseling & Psychological Services \(CAPS\)](#) can provide confidential counseling support. Call them at (831) 459-2628.
- You can report gender discrimination and sexual harassment and violence directly to the University’s [Title IX Office](#) by calling (831) 459-2462 or by using their [online reporting tool](#).
- Reports to law enforcement can be made to the UC Police Department, (831) 459-2231 ext. 1.
- For emergencies, call 911.

Note: The following statements are optional. You may choose to incorporate any or all of them as they are or (even better) revise them so that they are more relevant to your course or field.

ACADEMIC INTEGRITY

All members of the UCSC community benefit from an environment of trust, honesty, fairness, respect, and responsibility. You are expected to present your own work and acknowledge the work of others in order to preserve the integrity of scholarship.

Academic integrity includes:

- Following exam rules
- Using only permitted materials during an exam
- Viewing exam materials only when permitted by your instructor
- Keeping what you know about an exam to yourself
- Incorporating proper citation of all sources of information
- Submitting your own original work

Academic misconduct includes, but is not limited to, the following:

- Disclosing exam content during or after you have taken an exam
- Accessing exam materials without permission
- Copying/purchasing any material from another student, or from another source, that is submitted for grading as your own
- Plagiarism, including use of Internet material without proper citation
- Using cell phones or other electronics to obtain outside information during an exam without explicit permission from the instructor
- Submitting your own work in one class that was completed for another class (self-plagiarism) without prior permission from the instructor.
- Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript. For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the [Academic Misconduct page](#) at the [Division of Undergraduate Education](#).

INTELLECTUAL PROPERTY

The materials in this course are the intellectual property of their creators. As a student, you have access to many of the materials in the course for the purpose of learning, engaging with your peers in the course, completing assignments, and so on. You have a moral and legal obligation to respect the rights of others by only using course materials for purposes associated with the course. For instance, you are not permitted to share, upload, stream, sell, republish, share the login information for, or otherwise disseminate any of the course materials, such as: video and audio files, assignment prompts, slides, notes, syllabus, simulations, datasets, discussion threads. Conversely, any materials created solely by you (for example, your videos, essays, images, audio files, annotations, notes) are your intellectual property and you may use them as you wish.

RELIGIOUS ACCOMMODATION

UC Santa Cruz welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request reasonable accommodation for religious practices. The instructor will review the situation in an effort to provide a reasonable accommodation without penalty. You should first discuss the conflict and your requested accommodation with your instructor early in the term. You or your instructor may also seek assistance from the [Dean of Students office](#).

PRINCIPLES OF COMMUNITY

You may choose to involve students in the preparation of principles of community for your course. This allows students to be partners in deciding what guidelines you will collectively follow to ensure free, open, and respectful discussions. A sample of such principles follows.

The University of California, Santa Cruz expressly prohibits students from engaging in conduct constituting unlawful discrimination, harassment or bias... [More here](#). I am committed to providing an atmosphere for learning that respects diversity and supports inclusivity. We need to work together to build this community of learning. I ask all members of this class to:

- be open to and interested in the views of others
- consider the possibility that your views may change over the course of the term
- be aware that this course asks you to reconsider some “common sense” notions you may hold
- honor the unique life experiences of your colleagues
- appreciate the opportunity that we have to learn from each other
- listen to each other’s opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- ground your comments in the texts we are studying. Refer frequently to the texts and make them the focus of your questions, comments, and arguments. This is the single most effective way to ensure respectful discussion and to create a space where we are all learning together.

REPORT AN INCIDENT OF HATE OR BIAS

The University of California, Santa Cruz is committed to maintaining an objective, civil, diverse and supportive community, free of coercion, bias, hate, intimidation, dehumanization or exploitation. The Hate/Bias Response Team is a group of administrators who support and guide students seeking assistance in determining how to handle a bias incident involving another student, a staff member, or a faculty member. To report an incident of hate or bias, please use the following form: [Hate/Bias Report Form](#).

STUDENT SERVICES

Counseling and Psychological Services

Many students at UC Santa Cruz face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients’ cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

Student Success and Engagement Hub

The Division of Student Success provides campus-wide coordination and leadership for student success programs and activities across departments, divisions, the colleges, and administrative units.

Tutoring and Learning Support

At Learning Support Services (LSS), undergraduate students build a strong foundation for success and cultivate a sense of belonging in our Community of Learners. LSS partners with faculty and staff to advance educational equity by designing inclusive learning

environments in Modified Supplemental Instruction, Small Group Tutoring, and Writing Support. When students fully engage in our programs, they gain transformative experiences that empower them at the university and beyond.

Slug Support Program

College can be a challenging time for students and during times of stress it is not always easy to find the help you need. Slug Support can give help with everything from basic needs (housing, food, or financial insecurity) to getting the technology you need during remote instruction.

To get started with SLUG Support, please contact the [Dean of Students](#) Office at 831-459-4446 or you may send us an email at deanofstudents@ucsc.edu.

Slug Help/Technology

The ITS Support Center is your single point of contact for all issues, problems or questions related to technology services and computing at UC Santa Cruz. To get technological help, simply email help@ucsc.edu.

On-Campus Emergency Contacts

For all other help and support, including the health center and emergency services, Click here to go to UCSC's [Emergency Services](#) page. Always dial 9-1-1 in the case of an emergency.