

Calculus with Application 11A

Summer 2023

Instructor information

Instructor

Hoda Malak

Email

hmalak@ucsc.edu

Meeting Location & Time

Zoom, TuTh 6:00-9:30 PM (PST)

General information

Description

This course is synchronous online course specifically designed for students in life science fields like biology and biochemistry, aiming to equip them with tools to apply calculus in modeling and analyzing biological phenomena. The curriculum encompasses a range of topics including differentiation, exponential growth and decay, optimization of biological processes, population dynamics, and the interpretation of mathematical models in biology. By the end of this course students will cultivate the essential skills to utilize calculus as a robust tool for comprehending and predicting dynamic biological systems.

Prerequisites

MATH 3 or AMS 3; or mathematics placement (MP) score of 300 or higher; or AP Calculus AB exam score of 3 or higher. Prerequisite waived for non-UCSC students.

Learning Outcomes

- Analyze mathematical models in life sciences.
- Explore how calculus concepts can be applied in life sciences.
- Interpret rates of change.
- Compute derivatives.
- Improve their reading skills of math terminology.
- Utilize teamwork.

TA information

TA

Boyu Chen

Email

Bchen60@ucsc.edu

Office Hours

TBD

Communication

Canvas

Announcements will be done using Canvas.

Email

Contact me directly at my UCSC email hmalak@ucsc.edu

Edstem

We will use Ed for questions regarding HW, exams, lectures, etc. This tool is great for collaboration and writing math. It is difficult to type math in an email or in Canvas, so use Ed for all content related questions.

Office Hours

If you have any questions or concerns reach out to me during office hours. My office hours are Wednesday and Friday 11:00 AM-12:00 PM or by appointment (please request an appointment at hmalak@ucsc.edu).

Zoom Information

- Lectures

Meeting ID: 995 2893 1505

Passcode: math11a

Link: <https://ucsc.zoom.us/j/99528931505?pwd=TGhueHpxaUdUZTFzUHJCSGN6cGNKUT09>

- Office Hours

Meeting ID: 497 962 1965

Passcode: 763317

Link: <https://ucsc.zoom.us/j/4979621965?pwd=NnRnU0pGdERFUXBBK1ICdIJRUG1kdz09>

Grading Policy

Homework and Classwork

- Pre-class quizzes on Canvas (7%)

These include reading the module notes and working on the short assignments that you will complete on canvas. There will be Pre-Class assignments per lecture. These will be due before the lecture starts. The lowest 5 Pre-class assignment grades will be dropped.

- Post-class quizzes on Canvas (8%)

At the end of each module, you will find a section quiz. These quizzes will be available after the lecture ends and are due by Sunday midnight.

- Edfinity homework (20%)

Each week you will have two homework assignments, one due Friday midnight and one due Sunday midnight. Late assignments are subject to 20% grade penalty. We will use the online platform edfinity which is one of the most affordable options for our class. The subscription is 25\$ for the entire summer session one. The lowest 4 post-Class assignment grades will be dropped.

Note that online homework and quizzes are not extended under any circumstances.

- Projects (10%)

You will have an application project. This project can be worked in groups of at most 5 members. You will have two options to select between and you only need to complete **one** option for the project.

- **Reflection and Engagement (5%)**

In each module you will find a reflection quiz where you are going to give us feedback on the learning experience you had in each section of the course. The score of these quizzes will count towards this grade. Also participating in Ed discussions will count towards this grade.

- **Discussion Sections (Bonus 3%)**

Discussion sections are a great place to maintain a deep understanding of the topics. Attendance is not mandatory but is highly recommended. If you attend at least 7 sessions you will get a bonus of 3%, 5-6 sessions you will get a bonus of 2% and 3-4 sessions you will get a bonus of 1%.

- **Exams**

The format of the exam will be announced later. Instructions for each exam will be announced on Canvas. No makeup exams under any circumstances. Under a valid emergency the midterm exam grade will be replaced by the final.

- **Midterm (20%)**

The midterm covers the modules lecture1-2-3 and Lecture 4 (11-Continuity) on Fri, Jul 16th time window to be assigned.

- **Final (30%)**

The final exam is comprehensive on Th, Jul 27th time window to be assigned (will be available during lecture time).

Course materials

Required materials

The required course materials for this class will be available through.

- Canvas (<https://canvas.ucsc.edu/courses/64099>)
- Edfinity

Optional Textbook

Bio-calculus: Calculus, Probability and Statistics for the Life Sciences ISBN: 9781305804333,

By Stewart James and Troy Day

Bio-calculus: Calculus for the Life Sciences ISBN-13:978-1-133-10963-1 by James Stewart and Troy Day

Course schedule

Week	Topic	Reading and Activities
Week 1	Functions	Lecture 1 module
	Functions and Sequences	Lecture 2 module
Week 2	Limits	Lecture 3 module
Week 3	Limits/Derivatives	Lecture 4 module
	Derivatives	Lecture 5 module
	Midterm Exam	Lecture 1-2-3 modules and Lecture 4(11-Continuity)

Week	Topic	Reading and Activities
Week 4	Derivatives	Lecture 6 module
	Application of Derivatives	Lecture 7 module
	Project	Grade-scope
Week 5	Applications of Derivatives/Integrals	Lecture 8 module
	Final Exam	Everything is included except the project

Additional information and resources

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.

TITLE IX/CARE ADVISORY

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 as 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.

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.