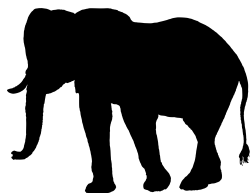
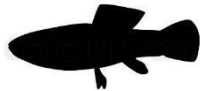


# *Development & Physiology of Organisms (BIOE 20B)*

## *Summer 2024 REMOTE*



## Welcome

*Dear Students,*

*On behalf of myself and our TA Pedro Juarez and Grading Support Theresa Tatom-Naecker, I am so thrilled to welcome you to Bioe 20 where we explore the physiology and development of plants and animals. As your teaching team, we recognize the challenges that all of us are facing from housing to continued issues with Covid and more. As your instructor, I have done my best to design this course around the principles of flexibility and compassion while still offering a rigorous learning opportunity to further your careers in biology.*

*In this summer session class, the pace of the course makes learning the material especially challenging. We will be providing many opportunities for you to be exposed to the material and practice the skills and material in these 5 weeks so that you can be prepared to excel in your next set of courses. To do that, I appreciate you bringing your whole self to this class and your strong commitment to learning. As you will see, the design of this class is focused on learning, not just the grade.*

*I know that you are here to explore the mysteries of the natural world and that you will fully engage yourselves to get the most of this experience. You are supported by an amazing team of instructors to help you meet the academic goals you have set for yourself. I encourage you to reach out with your questions, enthusiasm, or whatever needs I can address.*

*Best,  
Professor Carrillo, Pedro, and Theresa*

## Teaching Team

### Instructor

Elsie Carrillo

### Teaching Assistant

Pedro Juarez

### Grading Support

Theresa Tatom-Naeker

### Tutoring Support

Cayla Gapusan

## EMAIL

[elpcarri@ucsc.edu](mailto:elpcarri@ucsc.edu)

[pjuarez1@ucsc.edu](mailto:pjuarez1@ucsc.edu)

[ttatomna@ucsc.edu](mailto:ttatomna@ucsc.edu)

[ttatomna@ucsc.edu](mailto:ttatomna@ucsc.edu)

## COURSE WEBSITE

On Canvas

Find the syllabus,  
course schedule,  
contact info and more.

Link to Class Discord:

<https://discord.gg/z96ZV72YsZ>

## ***Class Times (READ CAREFULLY)***

Day	Time	Instructor	Description
Tue/Thu	9-11:30	Professor Carrillo	During these sessions we will review critical content from the videos and do practice questions. There will occasionally be extension material that was not in the video. These will be recorded. <i>To best facilitate learning, both sessions are required.</i>
Tue/Thu	11:30-12:30	Professor Carrillo	Office Hour (Student Hours) - Stick around and talk biology, careers, undergraduate research, or anything that you want to discuss!
Tue	1:30-2:30	Pedro	These are discussion session times where you will work with the TA to dig deeper into the course content and work on your scientific literature project.
Thu	1:30-2:30	Pedro	These are discussion session times where you will work with the TA to dig deeper into the course content and work on your scientific literature project.

## Course Structure & Attendance Policy

This course is designed as a hybrid course. Most of the content is available asynchronously via Canvas but there is an attendance requirement. Each week there are two whole class sessions of 2.5 hours each with Professor Carrillo. During this time we will review key material, work homework problems and discuss some of the concepts in more depth. There are also discussion sessions each week with our TA Pedro. **You need to attend both lectures with Professor Carrillo each week.** Sections are strongly encouraged but not mandatory. Note that we will do a lot of the course work together in class. Attendance is therefore helpful in minimizing the outside time you spend working solo. **You get 1 free excused absence automatically.**

**Why do I require attendance?** Each session is the equivalent of a week of material in the normal quarter. So coming to class will help you keep up. I have also found that I can respond to questions that folks have better when we have at least some face to face time. I also want to see folks engage in the community of the class which help us as humans and also helps with our learning.

***SUMMER NOTE: The drop deadline is Aug 5.***

## *The Basics*

### **COURSE DESCRIPTION:**

This course will cover structure and function of plants and animals from the cellular to the organismal level including anatomy, physiology, and development.

### **REQUIRED TEXT:**

Life – The Science of Biology 11th Edition (Sadava et al). You can use the older editions (check the equivalency table at the end of this syllabus). The syllabus is based on the 11th edition. There is an ebook edition available as well. You can find this at the bookstore or online. Please reach out to Professor Carrillo if you are unable to obtain a copy of the text.

### **DRC STUDENTS:**

WELCOME! Please be sure to introduce yourselves to the instructor via email or private chat during an online lecture in the first week of class and let me know how I may facilitate your learning experience. In the remote learning environment we will need to address things a little differently. The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations or any other disability-related matter, email the DRC Schedulers at [drc@ucsc.edu](mailto:drc@ucsc.edu) for an appointment.

### **MAJOR QUALIFICATION**

This course is required to declare one or more of the majors in the Division of Physical & Biological Sciences. Your performance in this course may determine your eligibility for a science or math major. For more information on major qualification, please go to: <https://undergrad.pbsci.ucsc.edu/eeb/index.html>

## *Frequently Asked Questions*

### **AM I REQUIRED TO ATTEND CLASS?**

This course is designed as a hybrid course. Most of the content is available asynchronously via Canvas but there is an attendance requirement. Each week there are two whole-class sessions of 2.5 hours each with Professor Carrillo. During this time we will review key material, work homework problems and discuss some of the concepts in more depth. There are also discussion sessions each week with our TA Pedro. **You need to attend both sessions of the lectures with Professor Carrillo each week.** Sections are strongly encouraged but not mandatory. Note that we will do a lot of the course work together in class. Attendance is therefore helpful in minimizing the outside time you spend working solo. **You get 1 free excused absence automatically.**

**Why do I require attendance?** Each session is the equivalent of a week of material in the normal quarter. So coming to class will help you keep up. I have also found that I can respond to questions that folks have better when we have at least some face to face time. I also want to see folks engage in the community of the class which help us as humans and also helps with our learning.

### **HOW DO I PARTICIPATE IN CLASS?**

There are multiple ways for you to participate depending on your comfort level and situation. These include speaking up or chatting during class or section, contributing to the discussion board on Canvas, “attending” office hours, and competing assignments when they come up. Participation is especially valued in this remote learning environment and we all have to work harder to participate in the community of the course.

### **WHAT WILL CLASS BE LIKE?**

This course is designed such that you can get most of the content asynchronously and our synchronous time will be spent doing some summary of big or tricky ideas as well as working through problems and questions.

### **WHAT WILL SECTION BE LIKE?**

Section time will be structured time to work on specific content and skill exercises with your peers, and a TA. you can attend ANY section that you wish. Attendance at section (any section) is strongly recommended. If for some reason this doesn't work for your situation, please email Professor Carrillo.

### **HOW WILL I BE ASSESSED ON WHAT I HAVE LEARNED?**

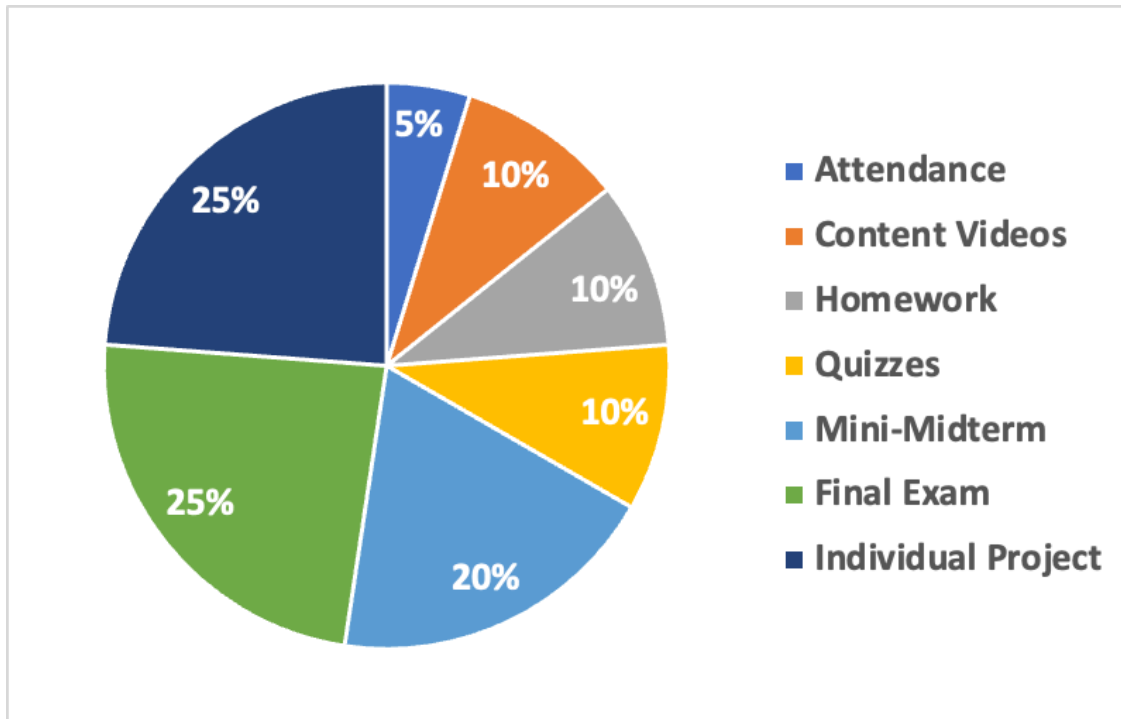
You will be asked to do weekly quizzes, homework, an individual project and various participation exercises. There will also be an open book final exam.

### **HOW SHOULD I ENGAGE WITH THE COURSE OUTSIDE OF CLASS TIME?**

You should be working through the assigned work in the modules prior to class if indicated and spending about 1-3 hours a day working on this class. You should think about this class in terms of what you need to get done

each week. All assignments will be due at the same time, Sunday night at midnight. You should plan to work on weekly assignments to meet this deadline.

## HOW WILL MY GRADE BE DETERMINED?



*\*\*Note that because this is a partially asynchronous course. To pass the course, at least 80% of the points for the content videos must be earned regardless of the points earned in other categories.\*\**

## WHAT DOES IT MEAN TO HAVE ACADEMIC INTEGRITY? WHY IS IT IMPORTANT?

Academic integrity means conducting yourself in a way that is consistent with the academic code of conduct of UCSC. More importantly, it means conducting yourself in such a way that you are engaging in the course and with the other members of our community with respect for learning. As in life, taking short cuts may lead to short term gains but almost certainly will lead to long term problems. Cheating on weekly quizzes or copying assignments means you will not really learn the material and end up being unprepared going forward. Most people do not come to college to just get by – rather – we come to college to deeply learn and improve ourselves intellectually. Of course, in doing so we also improve our chances of securing a well-paying job that we are passionate about.

## WHAT KINDS OF THINGS I AM ALLOWED TO DO WHEN TAKING WEEKLY QUIZZES, HOMEWORK?

The weekly quizzes for this course will be online. You are allowed to consult your notes and textbook as well as online sources, though all assessments will be doable without online sources. You are NOT permitted to consult with peers for these particular assignments.

## WHAT IS THE DUE DATE FOR THE CONTENT VIDEOS?

The content videos have due dates that correspond to when I will be discussing the material in class. Content videos will remain open for the entire course and you can always go back and rewatch videos. All videos will close at the end of the term. There will be no exceptions to keep them open past this date.

## WHAT KIND OF MUSIC DOES YOUR TEACHING TEAM LIKE?

Professor Carrillo enjoys listening to movie soundtracks like Inception and Interstellar, jazz, and popular bands like Coldplay - her favorite song is *The Scientist*. *What kinds of music do you like?* **LET'S SHARE MUSIC – add songs to our class playlist here:**

<https://open.spotify.com/playlist/1lOgyTi88cjXgodIVkSKDS?si=c2b207ae0de94194>

## I HAVE A PROBLEM WITH THE COURSE – WHO SHOULD I ASK?

You should check the syllabus and canvas site then, ask a peer, a TA, or email Professor Carrillo. **If something comes up for you PLEASE email Professor Carrillo so we can work out a solution together.** Please consider joining our class Discord server so you can consult your classmates and form study groups. Keep a look out for reminders and announcements! Join via the link provided here: <https://discord.gg/z96ZV72YsZ> or form your own study groups via this [Google Sheet](#).

# Other Important Information

## LOGISTICS

**Please refer to Canvas for all class instructions and assignments.** I will be sending weekly emails with upcoming due dates. Generally, work will be due by Sunday but there may be exceptions. The syllabus is subject to change. Work is all due on canvas by the due date. **The canvas due dates are the most accurate - they supersede the syllabus if there is a discrepancy.**

## LATE WORK POLICY

For this quarter, all deadlines will have a 24-hour grace period. If you can't complete something or you just plain forget, email your TA ASAP to discuss a plan. After 24 hours, late assignments will be docked 10% per day for up to 1 week. After the week, the assignment will be closed. If you find yourself missing this one-week deadline, please email Professor Carrillo and cc your TA. Considerations for acceptance of late work past the one-week open period, will be made case by case.

## ACTIVE LEARNING

This class values your participation. In both class and section we will facilitate your learning by incorporating opportunities for you to actively engage with the material. *Scientific data shows that people learn more effectively when they take an active role in their learning even in class!*

**Passive learning strategies include:** reading book or lecture notes, watching video recordings, making flash cards, making vocabulary lists, rewriting your notes in different color inks. These are all good but are NOT good enough to help you keep an A in this course.

**Active learning strategies include:** drawing and labeling diagrams, standing at a whiteboard and walking someone else through a concept, asking "what if" questions in which you challenge your understanding of

material by asking what would happen if I perturb the system in a particular way (thought questions in class are examples), asking experimental design questions and challenging yourself to understand how an experiment answers a particular question, asking new scientific questions, making up sample quizzes for yourself and exchanging them with a friend, teaching the material to your peers, friends, family, or pet!

## STUDENT HOURS

Students are **enthusiastically** encouraged to attend the office hours of your instructor and TA. You are welcome to come with specific questions or to just “talk biology”. We will not respond to requests for notes or “what is going to be on the exam.” Professor Carrillo’s Office Hours are generally group question and answer periods. If you have a private question/issue to discuss, please contact me ahead of time to make an appointment.

## IF YOU ARE TAKING THIS COURSE AGAIN

Please check in with the instructor in Office Hours so we can figure out a strategy for you to be successful the second time through.

## Session 2

July 29 - August 30, 2024

### Deadlines

- **Add/Swap** - Thursday, August 1
- **Drop** - Monday, August 5 (tuition reversed)
- **Request "W" Grade** - Sunday, August 18 (no tuition reversal)
- **Change Grade Option** - Sunday, August 25
- **Grades Due** - Thursday, September 5

**THIS COURSE IS BEING RECORDED AND WILL NOT BE CIRCULATED BEYOND OUR UCSC COMMUNITY.**

## MAIN LEARNING OBJECTIVES

- 1) Students should be able to *describe* the principles and *explain* the physiological functions of the core mammalian organ systems including energy balance, digestion, osmoregulation, circulation and respiration, and the nervous system.
- 2) Students should be able to *describe* the idea of differential gene expression (DGE) and *provide multiple examples* as well as *illustrate and explain* the key developmental mechanisms that lead to DGE during early development.

- 3) Students should be able to *describe* the key patterns of cell division and important developmental phases in a variety of animal species.
- 4) Students should be able to *summarize and illustrate* the key physiological structures and mechanisms in plants for water and sugar transport, growth, photosynthesis, and reproduction. They should also be able to *identify* key concepts of plant nutrition.
- 5) Students should be able to accurately *predict* symptoms, outcomes, or potential outcomes provided a physiological perturbation (disease, drug, environmental change) for any of the animal, plant, or developmental systems covered.
- 6) Students should be able to read and *interpret* graphical data or *construct* an accurate graph provided numerical or written data about the core physiological concepts that are covered in the course.
- 7) Students should be able to read and *translate* into plain language (no jargon) a passage or abstract from a scientific paper.
- 8) Students should be able to use the skill of annotation to read and understand a scientific paper.
- 9) Students should be able to describe the findings of a scientific paper relevant to their life or interests in plain language to a non-science person.

## TUTORING SUPPORT SERVICES

There is tutoring available for this class, provided by [Learning Support Services \(LSS\)](#)!

Learning Support Services Tutors are an important part of the teaching team and are here to help you be successful. [Tutoring](#) is for everyone and open to all students in class to get extra practice on the things you already know or the things you want to know better.

Your tutor(s) is an undergraduate student who took the class, did well, and received extensive training on how to help you learn! Sessions are one-hour long, available several days a week and attendance is voluntary.

Why attend? Easy, students who attend sessions weekly tend to earn a higher final grade than students who do not participate.

Ask your tutor for more information about session times, visit the LSS [website](#), or visit [in person at the ARCenter](#). You can also view your Tutor's schedule and sign up on [Tutor Hub](#).

[Learning Support Services](#), catch-up, keep-up, excel!



**ALL ASSIGNMENTS & QUIZZES ARE TURNED IN VIA CANVAS**  
*Due dates are subject to change*

Week	Date	Topic	Read Watch	Major Individual Assignments <i>All assignments are due on Sunday at 11:59pm unless otherwise stated**</i>	Individual Project Work Due on Sundays at 11:59 with 24 hour grace period	Section Activity
Week 1	July 30	Logistics, Form and Function, SA/V Ratios	Chapter 39	<i>Pre-survey Syllabus Acknowledgment Academic Integrity Watch all content videos Graphing Homework Homework 1 Quiz 1</i>	1) <i>Decide on a plant, animal, or developmental disease to focus on, look for scientific paper in Google Drive</i> 2) <i>Select scientific paper and submit your chosen paper; read paper</i>	<b>Finding a Scientific Paper</b> <b>Homework Help</b> <b>SKILL: Annotation</b> <b>Mtabolic Jamboard</b>
		Animal Tissues, Homeostasis, Metabolism, Bioenergetic Strategies	Module 0, 1			
	Aug 1	Nutrition & Digestion	Chapter 50 Module 2			
Week 2	Aug 6	Osmoregulation, Salt & Water Balance; Mammalian Kidney Function	Chapters 51, 49	<i>Watch all content videos Homework 2 Homework 3 Quiz 2 Quiz 3</i>	1) <i>Read and annotate scientific paper</i> 2) <i>Turn in 1 paragraph plain language summary of the paper</i>	<b>Plain Language Summary</b> <b>Homework Help</b> <b>Digestion Jamboard</b> <b>Heart Jamboard</b>
		Animal Circulatory Systems	Module 3			
	Aug 8	Animal Respiratory Systems	Chapters 48, 44			
		Nervous Systems	Module 4			
Week 3	Aug 13	Mini-Midterm	Chapters 43, 19	<i>Watch all content videos Homework 4 Homework 5 Quiz 4 Quiz 5</i>	1) <i>Reread your scientific paper</i> 2) <i>Focus on Methods Flow Chart Due</i>	<b>Methods Flow Chart</b> <b>Homework Help</b> <b>SKILL: Methods Flow</b> <b>SKILL: Reading Figures</b> <b>in a Scientific Paper</b> <b>Development Jamboard</b>
		Development Part 1: Stages of development, differential gene expression, cell potency	Module 5			
	Aug 15	Development Part 2: Maternal Effects Genes, Stem Cells	Chapters 19, 43			
		Development Part 3: Germ Layers, Gastrulation, Human Stages of development	Module 6			
Week 4	Aug 20	Introduction to Plants, Plant structure function & Plant Tissues	Chapters 33, 34	<i>Watch all content videos Homework 6 Homework 7 Quiz 6 Quiz 7</i>	1) <i>Figure Annotation due</i> 2) <i>Work on Final Creative Project</i>	<b>Figure Annotation</b> <b>Homework Help</b> <b>Water Potential</b> <b>Jamboard</b> <b>SKILL: Planning</b> <b>Creative Project</b>
		Water Transport: Water potential, Transpiration Cohesion Tension Theory, Sugar Transport	Module 7			
	Aug 22	Plant Nutrition: Soil, Cation Exchange, Mycorrhizae, Nitrogen Fixation	Chapters 35, 36			
		Plant Growth & Regulation, Acid growth hypothesis	Module 8			

Week 5	Aug 27	Plant Defenses	Chapters 36, 10	<i>Watch all content videos</i> <i>Final Exam - DUE AUG 30</i>	<i>Final Project Due Sep 1</i>	<b>Homework Help;</b> <b>Photosynthesis</b> <b>Jamboard</b> <b>Material Review</b>
		Photosynthesis	Module 9			
	Aug 29	Plant Reproduction & Development/Pedro Juarez Guest Lecture	Chapters 10, 37			
		Finish plant reproduction & All the questions: Grad School, Careers, Undergrad Research	Module 10			

**Syllabus subject to change | Consult canvas for final due dates | The final exam will be similar in structure to a quiz but will be comprehensive**  
**The final exam will open on Aug 29 and will close on Aug 30 with NO grace period.**  
**\*\* There is a 24 hour grace period on all assignments. After that, quizzes close and other assignments will be docked for lateness.**

### Book Chapter Equivalents\*

(Syllabus is based on the 11th edition)

Ninth/Tenth Edition	Eleventh Edition	Twelfth Edition
40	39	38
51	50	49
52	51	50
50	49	48
49	48	47
45	44	43
48	47	46
19	19	Gone
44	43	42
34	33	32
35	34	33
36	35	34
37	36	35
10	10	10
38	37	

### Grading Scale

% in Course	Grade
94-100	A
90-93	A-
88-89	B+
84-87	B
80-83	B-
78-79	C+
70-77	C
68-69	D+
63-67	D
60-62	D-
</=59	F

**Please note that most of the content videos for this course will need to be completed in order to pass this course. If you complete all the work but less than 75% of the content videos, you will get a non-passing score.**

**A+ are only given for truly exceptional work. An A+ and an A count the same for GPA points.**