

BIOE126 | Biology of Large Marine Vertebrates

Summer 2021 (10 weeks)



Instructor: Dr. Roxanne Beltran (roxanne@ucsc.edu)

Office: [Zoom Room](#)

Office Hours: Wednesdays 3-4pm

Dates: June 21 – August 27

Meeting Times: Wednesdays 9-11am or noon-2pm for discussion section

Zoom Links: Provided on the Canvas website.

Please refer to Canvas for all class lectures and assignments and check your UCSC email regularly to ensure that you are receiving important course announcements. There is no required text for this class. I strongly encourage you to come visit me during office hours, either with specific questions or to just talk about natural history! I would love to get to know you better.

Enrollment Logistics

- Prerequisites are BIOE 20C.

Learning Objectives

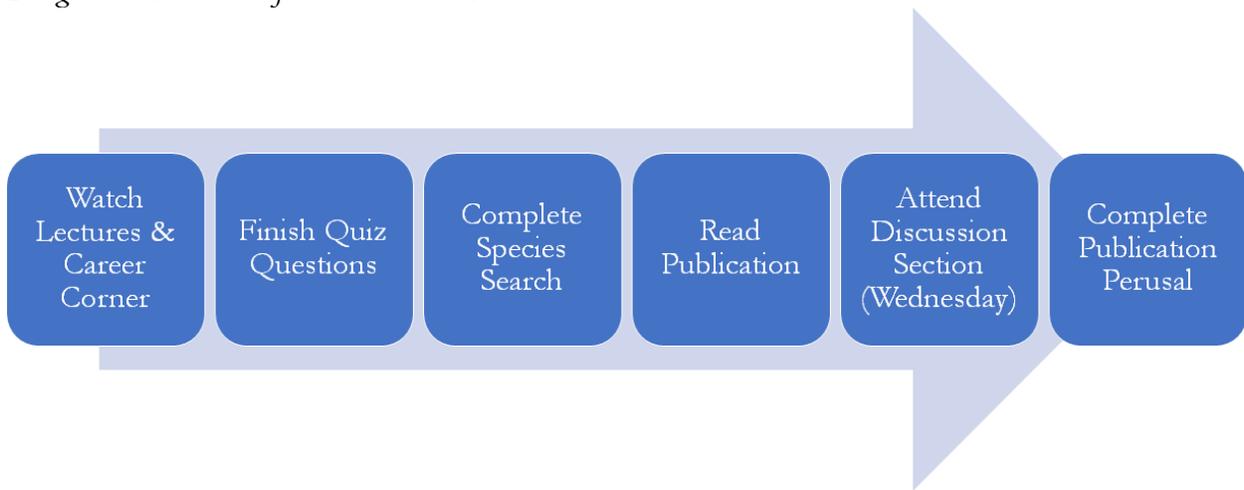
Large marine vertebrates are incredible animals! In this course, we will cover a broad overview of the ecology, evolution, physiology, and behavior of marine mammals, birds, and turtles, with an emphasis on local Monterey Bay species. By the end of the course, you will be able to:

- Recognize local Monterey Bay species and describe basic aspects of their life histories
- Give examples of specialized adaptations that allow large marine vertebrates to survive and thrive in the marine environment
- Describe how ecology, evolution, physiology, and behavior interact to drive the patterns we see in nature
- Synthesize interdisciplinary knowledge to understand management strategies for marine mammal conservation
- Read primary literature and interpret data figures to summarize recent research findings on large marine vertebrates
- Know about potential career options in the field of large marine vertebrates

Like many topics, learning about large marine vertebrates works best when you engage and participate. I will do everything I can to create frequent opportunities for active learning. In return, I ask that you do your best to be a proactive participant in this course. Whether this means creating informal study/discussion groups, or developing personal learning goals, I will leave the choice to you. Let me know how I can support you.

Remote Course Format

The general structure of each week will be:



1. **Lectures:** To maximize the amount of interaction with classmates and faculty as well as active problem-solving, I have chosen to pre-record 3-4 mini lectures each week and upload them to Canvas. I hope this will help you engage with the course material and give you the option to revisit lectures when needed. *You are responsible for watching these lectures prior to the discussion section, and will get points for doing so.*
2. **Career Corner:** To help you understand some possible career trajectories in the field of large marine vertebrates, I have asked some of my colleagues to pre-record a short introduction to themselves and their work. *You are responsible for watching these career corners prior to the discussion section, and will get points for doing so.*
3. **Quiz Questions:** To help you synthesize and demonstrate your understanding, I have created weekly quizzes, each with 15 questions, on the lecture materials. These types of questions are similar to those on the final exam. *You are responsible for answering the Quiz Questions prior to the discussion section, and will get points for doing so.*
4. **Species Search:** To help you apply your knowledge to a new situation, you will complete take-home assignments to summarize the biology of a single study species, which will be assigned to you during the first week of class. You will search the primary literature for information about your species and submit a 1-page summary. *You are responsible for*

submitting the Species Search assignment prior to the discussion section, and will get points for doing so.

5. **Publication Perusal:** To introduce you to hot-off-the-press research, I have picked one peer-reviewed publication each week for you to read and discuss with a small group of your peers. You will read the paper by yourself before the discussion section, and then submit a summary after the discussion section. *You are responsible for Perusing the Publication prior to the discussion section and submitting the assignment no later than 1 week after your discussion section, and will get points for doing so.*

Expectations and Grading

This is a 5-unit course. Expectations for the course consist of the responsibilities detailed above, totaling 15 hours per week (e.g., 3 hours of lecture, 1 hour of discussion, 4 hours of reading, 7 hours of assignments and studying). Grades will be calculated as follows:

- Watching Lectures & Career Corners (20%)
- Quiz Questions (20%)
- Species Search (20%)
- Publication Perusal (20%)
- Final Project (10%)
- Final Exam (10%)

In light of the ongoing Covid-19 pandemic, I understand that you may be dealing with urgent matters outside of school. Your health and well-being are important to me. Feel free to reach out if you need to discuss your participation in the course and I will accommodate you as best I can.

Weekly Work

Week	Lectures	Career Corner	Publication Perusal
1	<ul style="list-style-type: none"> ● Course Overview ● Instructor Introduction ● Lecture Overview ● The Marine Environment 	Michelle Hanenburg (Animal Trainer)	Sydeman 2015 Science
2	<ul style="list-style-type: none"> ● Taxonomy ● Evolution ● Anatomy 	Dan Costa (Professor)	Block 2011 Nature
3	<ul style="list-style-type: none"> ● Population dynamics ● Life History ● Technology/Methods ● Field Trip to Año Nuevo 	Florencia Vilches (Researcher)	Wood 2021 PLOS ONE

4	<ul style="list-style-type: none"> ● Energetics ● Locomotion ● Thermoregulation 	Greg Frankfurter (Veterinarian)	Pagano 2018 Science
5	<ul style="list-style-type: none"> ● Molt ● Migration ● Foraging 	Tony Orr (Fisheries Biologist)	Harrison 2018 Nature Ecology & Evolution
6	<ul style="list-style-type: none"> ● Feeding ● Diet ● Diving Behavior/Physiology ● Fasting 	Taiki Adachi (Instrument Developer)	Adachi 2021 Science Advances
7	<ul style="list-style-type: none"> ● Social systems ● Reproduction 	Josh London (Data Scientist)	Shaffer 2006 PNAS
8	<ul style="list-style-type: none"> ● Sensory systems ● Cognition ● Captive Animals 	Shelby Burman (Animal Trainer)	Strobel 2018 Journal of Experimental Biology
9	<ul style="list-style-type: none"> ● Case study: Elephant Seal ● Case study: Sea otter ● Case study: Emperor Penguins 	Diana Alvarado (Field Technician)	Watanabe 2020 PNAS
10	<ul style="list-style-type: none"> ● Human Disturbance ● Conservation ● Management 	Sara Young (Fisheries Biologist)	Final presentation: research proposal

My goal is to create an inclusive and supportive learning environment for all students that includes responsible, respectful interactions. Students are encouraged to bring any concerns regarding the class environment or content to me.

Disability Resource Center (DRC)

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 submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to us privately during office hours or by appointment, as soon as possible in the academic quarter, preferably within 1 week. We also encourage you to discuss with us ways we can ensure your full participation in this course. We encourage all students who may benefit to learn about the DRC and the UCSC accommodation process. You can visit the DRC website at drc.ucsc.edu to make an appointment with a DRC staff member. The phone number is 831-459-2089, or email drc@ucsc.edu.

Academic Integrity

For all assignments, answers should be in your own words (e.g., no plagiarism, including copy-pasting from a publication or website). You may paraphrase (put ideas and information in your own words, using a limited number of words from the original work. For example, if an article says “maximizing growth during the early years is thought to be a key factor in survival for juvenile cormorants”, you might summarize the sentence as “for cormorants, one important way to prevent mortality is to build mass while you are young”.

By enrolling in the university, students are automatically agreeing to abide by policies, including those on academic misconduct. Academic integrity and scholarship are core values that should guide our conduct and decisions as members of the UCSC community. Plagiarism and cheating contradict these values and are very serious academic offenses. Penalties can include a failing grade on an assignment or in the course, or suspension or expulsion from the university. Students are expected to familiarize themselves with and follow citation practices (<http://nettrail.ucsc.edu/ethics/index.html>) and the university's Rules of Conduct regarding student conduct and discipline:

<https://ue.ucsc.edu/academic-misconduct.html>

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Diversity Statement

As a community, we acknowledge the richness of commonalities and differences we share, the intrinsic worth of all who work and study here, and that science and learning are enhanced by investigation of and reflection upon multiple perspectives. We also aspire to create respect for and appreciation of all persons as a key characteristic of our campus community and to achieve an environment that welcomes and supports diversity as well as ensures full opportunities for all who teach, learn, work and do research here. The [EEB Department IDEA website](#) includes our full diversity, equity and inclusion statement, actions and links to give feedback or to report a problem.

Land Acknowledgement

The land on which we gather is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa

Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

TITLE IX

Please be aware that under the UC Policy on Sexual Violence and Sexual Harassment, faculty and student employees (including Teaching Assistants, Readers, Tutors, etc.) are “responsible employees” and are required to notify the Title IX Officer of any reports of incidents of sexual harassment and sexual violence (sexual assault, domestic and dating violence, stalking, etc.) involving students. Academic freedom exceptions exist for disclosures made within a class discussion or assignment related to course content; under those conditions only, a report to the Title IX Officer is not required. The Campus Advocacy Resources and Education (CARE) Office (831) 502-2273, care@ucsc.edu can provide confidential support, resources, and assist with academic accommodations. To make a Title IX report, please contact the Title IX Office at (831) 459-2462, website: <https://titleix.ucsc.edu/>. The Title IX office can also assist with academic, housing, work, and transportation adjustments and implement interim and safety measures.

CARE

UCSC Campus Advocacy, Resources & Education (CARE) believes that all people deserve to live and engage in an environment free from violence. We believe in promoting an environment where people can learn and work while being safe and healthy. We celebrate the differences on this campus and believe in working collectively to create a community that is free from violence, exploitation, and harassment and instead promotes safety and equity. For an appointment, call 831-502-2273 or email care@ucsc.edu.



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