

Syllabus

SIO-136

Marine Biology Laboratory

Spring 2016

Instructors

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Module

Ecology
Microbiology
Physiology

TA

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Office hours:

By appointment

Class hours:

Section

833628

833631

Day

Tu / Th

M / W

Time

1 – 5 pm

1 – 5 pm

Required textbooks:

Laboratory manual available at Soft Reserves
Coastal Fish Identification by Paul Humann

Field Trips:

Birch Aquarium

Cruise on R/V *Sproul*

March 28 & 29

May 7, 8 & 14 (Sat / Sun / Sat)

Course Goals:

This course will provide an introduction to current principles and techniques applicable to research problems in marine biology, and will consist of both laboratory and field exercises. A third of the course is devoted to pico-, phyto-, and zooplankton, a third to the physiology and biochemistry of marine organisms, and a third to field exercises, which will introduce students to intertidal, nearshore, and other marine ecosystems. This course will also provide students with a unique opportunity to experience work at sea on an oceanographic research vessel and allow them to gain hands-on experience conducting research in the intertidal zone.

Learning Objectives:

By the conclusion of the course students will be able to:

- Utilize field and laboratory techniques for the study of marine organisms.
- Use common laboratory equipment (ex. pipetmen, spectrophotometers, counting chambers, microscopes).
- Become familiar with equipment and concepts used in oceanographic research (ex. Niskin bottles, trawls, plankton nets, Secchi disk).
- Become familiar with the biology of diverse marine organisms ranging from bacteria to large animals.
- Understand some key physiological adaptations that allow organisms to thrive in the marine environment.
- Understand the interplay between the marine environment and organisms within it.
- Think critically about experimental processes and data collection and synthesize results.
- Find, read and evaluate primary literature.

Course Website:

Course materials will be available through the course website (<http://ted.ucsd.edu>). All students will need to be able to access this site. Be sure to check the course website frequently for announcements, updates and assignments.

Grading:

Due to the breadth of material covered in this course, the instructors of each module may emphasize different types of assignments; however, your overall grade will be based on quizzes, a laboratory notebook, participation and written assignments, including homework problems and laboratory reports.

	Points
Formal Lab Reports	300 (100 / module)
Homework	300 (100 / module)
Lab Notebook / Prelab / Participation	150 (50 / module)
Cumulative Quiz	250
Total	1000

Participation, Notebook and Attendance:

A. Lab participation:

Although you will be performing experiments and collecting data with a partner, make sure that you have the opportunity to participate. In other words, share the tasks so that everyone has an opportunity to gain experience. Further, you must hand in your own written assignments, in your own words (no plagiarism). You must also be on time because that is when experiments will be explained and safety information provided.

B. Lab Notebook:

You will be expected to keep a formal laboratory notebook for all of the experimental work you do in lab. Detailed instructions about how to keep a lab notebook are available in the lab manual.

C. Lab attendance is required:

If you are unable to attend lab for some reason, please **email the instructor directly**.

Materials required by second meeting:

- 1) Lab Manual (Soft Reserves)
- 2) Bound laboratory notebook with carbon paper (bookstore)
- 3) Safety glasses (at bookstore)
- 4) Lab coat (bookstore has cheap ones)
- 5) Proper clothing

Lab Schedule

			Instructor	Page
Module 1		Ecology		
March 28, 29	Lab 1	Diversity Metrics / Scientific communication (Birch Aquarium)	Semmens	20
March 30, 31	Lab 2	Mark-recapture techniques	Semmens	26
April 4, 5	Lab 3	Rocky intertidal ecology & field sampling	Semmens	32
April 6, 7	Lab 4	Rocky intertidal ecology & field sampling	Semmens	37
April 11, 12	Lab 5	Rocky intertidal data work up and analysis	Semmens	40
Module 2		Marine Microbiology		
April 13, 14	Lab 6	What's in a ml of seawater?	Brahamsha	42
April 18, 19	Lab 7	Marine microbes and human health	Brahamsha	48
April 20, 21	Lab 8	Marine microbes and human health (cont.) Prokaryotic phytoplankton	Brahamsha	51
April 25, 26	Lab 9	Eukaryotic phytoplankton diversity	Brahamsha	53
April 27, 28	Lab 10	Methods for measuring phytoplankton abundance	Brahamsha	55
May 2, 3	Lab 11	Microalgal interactions	Brahamsha	59
Module 3		Physiology		
May 4, 5	Lab 12 (14)	Respirometry (Fish functional morphology for Tu/Th Section)	Wegner	61 (68)
May 7,8 (Sat / Sun)		Fieldtrip R/V Sproul	Semmens / Širović	
May 9, 10	Lab 13 (12)	Respirometry cont. (Respirometry start for Tu/Th)	Wegner	61
May 11, 12	Lab 14 (13)	Fish functional morphology (Respirometry cont. for Tu/Th)	Wegner	68 (61)
May, 14 (Sat)		Fieldtrip R/V Sproul	TBA	
May 16, 17	Lab 15	Sound and hearing in the marine environment	Širović	79
May 18, 19	Lab 16	Marine mammal skeletal morphology	Širović	84
May 23, 24	Lab 17	Sea urchin fertilization	Širović	89
May 25, 26	Lab 18	Cruise make-up lab	Brahamsha	97
June 1, 2	Lab 19	Cumulative quiz	Wegner	98