

## Syllabus

**SIO-136**

**Marine Biology Laboratory**

**Spring 2015**

### Instructors

Aubrey Davis  
Brice Semmens  
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Nick Wegner

### Email

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### Module

Ecology  
Microbiology  
Physiology

### TA

Lyll Bellquist  
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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*

**April 8 & 9**

**April 11 & 12 (Sat / Sun)**

### 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 the 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.

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

### 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
<b>Module 1</b>		<b>Ecology</b>		
March 30, 31	Lab 1	Rocky intertidal ecology & field sampling	Semmens	20
April 1, 2	Lab 2	Rocky intertidal ecology & field sampling	Semmens	25
April 6, 7	Lab 3	Rocky intertidal data work up and analysis / Marine Fish ID	Semmens	28
April 8, 9	Lab 4	Diversity Metrics / Scientific communication ( <b>Birch Aquarium</b> )	Semmens	31
<b>April 11 &amp; 12 (Sat / Sun)</b>		<b>Fieldtrip R/V <i>Sproul</i></b>	Semmens / Širović	
April 13, 14	Lab 5	Mark-recapture techniques	Semmens	37
<b>Module 2</b>		<b>Marine Microbiology</b>		
April 15, 16	Lab 6	Molecular Ecology	Davis	43
April 20, 21	Lab 7	What's in a ml of seawater?	Davis	52
April 22, 23	Lab 8	Marine microbes and human health	Davis	58
April 27, 28	Lab 9	Marine microbes and human health (cont.) Prokaryotic phytoplankton	Davis	61
April 29, 30	Lab 10	Eukaryotic phytoplankton diversity	Davis	63
May 4, 5	Lab 11	Methods for monitoring algal growth	Davis	65
<b>Module 3</b>		<b>Physiology/Cell Biology</b>		
May 6, 7	Lab 12	Respirometry- metabolism and temperature	Wegner	69
May 11, 12	Lab 13	Respirometry (cont.)	Wegner	69
May 13, 14	Lab 14	Sea urchin fertilization	Wegner	76
May 18, 19	Lab 15	Mussel anatomy and feeding	Širović	84
May 20, 21	Lab 16	Sound and hearing in the marine environment	Širović	91
May 27, 28	Lab 17	Marine mammal skeletal morphology	Širović	96
June 1, 2	Lab 18	Fish functional morphology	Wegner	101
June 3, 4	Lab 19	Cumulative Quiz	Davis / Wegner	112