

Syllabus: Marine Biochemistry (SIO 181)

Instructors

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TA

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Office hours:

By appointment

Time (*Lectures*):

Tuesday & Thursday 11.00 am- 12.20 pm

Location (*Lectures*):

Lecture Hall (Room 227), Eckart Building

Sumner Auditorium

Time (*Seminars*)

Monday 4.00-4.50 pm OR Wed 5.00-5.50 pm

Location (*Seminars*)

Vaughn Hall 100

Final Exam:

TBD

Required textbooks:

None, instructors will upload reference material (TED)

Course Goals:

To provide an introduction of biochemical and physiological adaptations in diverse marine organisms and how these adaptations are important in their natural environment and in relation to anthropogenic activities.

Learning Objectives:

By the conclusion of the course, the students should be familiarized with biochemical and physiological adaptations used by marine organisms. In particular, they should have learned principles on essential physiological processes such as:

- Metabolism (aerobic and anaerobic),
- Acid/base regulation
- Nitrogen metabolism
- Osmoregulation (osmoconformers, osmoregulators)
- Thermoregulation
- Biochemistry and physiology of coral, *Osedax* worms, and hagfish
- Mechanisms to achieve and maintain buoyancy

The students should also become familiar with the most important biochemical and physiological adaptations that are characteristic of marine organisms, including general and species-specific mechanisms.

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:

Grades will be based on a “Midterm Exam” on lectures 1-12 (40% of the final grade), a “Final Exam” focused on lectures 13-19 (40% of the final grade), and “Seminars” (20% of final grade).

Schedule

MT	Tue April 3	Intro - General metabolism
MT	Thu April 5	Aerobic and anaerobic metabolism
MT	Tue April 10	Oxygen transport
MT	Thu April 12	Hypoxia adaptations
MT	Tue April 17	<i>Sodium/potassium ATPase, V-type proton ATPase, Carbonic Anhydrase</i>
MT	Thu April 19	<i>Acid/Base regulation I</i>
MT	Tue April 24	<i>Acid/Base regulation II</i>
MT	Thu April 26	Osmoregulation I
MT	Tue May 1	Osmoregulation II
MT	Thu May 3	Nitrogen metabolism
MB	Tue May 8	MIDTERM
MB	Thu May 10	Pharmacognosy & biomimicry
MB	Tue May 15	Thermal Strategies in the marine environment
MB	Thu May 17	Buoyancy
MB	Tue May 22	<i>Coral I Anatomy, Morphology, Cytology, Symbiosis</i>
MB	Thu May 24	<i>Coral II Calcification, pH regulation, bleaching</i>
MB	Tue May 29	<i>Bone-eating Osedax worm, Acid secretion, symbiosis</i>
MB	Thu June 5	<i>Hagfish feeding strategies, slime production</i>
MB	Tue June 7	Review Session
MB	TBD	FINAL

Note: 80-minute lectures

Instruction begins Monday April 3, ends Friday June 9.