

Syllabus: SIO 181: Marine Biochemistry Spring Term 2019

Instructor
Martin Tresguerres

Email
mtresguerres@ucsd.edu

TAs
Patrick Brunson
Shane Finnerty

jkbrunso@ucsd.edu
sfinnert@ucsd.edu

Office hours: By appointment

LECTURES

Time and Location Tuesday & Thursday 9.30 am- 10.50 am
Sumner Auditorium (SIO campus)

SEMINARS

Time and Location

- 1) Tuesday 4.00-4.50 pm
- 2) Tuesday 5.00-4.50 pm
- 3) Thursday 5.00-5.50 pm

All sections in Vaughn Hall 100 (SIO campus)

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 those 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 1-10 (40% of the final grade), a “Final Exam” focused on lectures 11-18 (40% of the final grade), and “Seminars” (20% of the final grade).

Schedule

Tue April 2	Intro - General metabolism
Thu April 4	Aerobic and anaerobic metabolism
Tue April 9	<i>Sodium/potassium ATPase, V-type proton ATPase, Carbonic Anhydrase</i>
Thu April 11	Oxygen transport
Tue April 16	Hypoxia adaptations
Thu April 18	<i>Acid/Base regulation I</i>
Tue April 23	<i>Acid/Base regulation II</i>
Thu April 25	Osmoregulation I
Tue May 1	Osmoregulation II
Thu May 2	Nitrogen metabolism
Tue May 7	MIDTERM
Thu May 9	Harmful algal blooms
Tue May 14	Thermal Strategies in the marine environment
Thu May 16	Diving physiology
Tue May 21	Buoyancy
Thu May 23	<i>Coral I Anatomy, Morphology, Cytology, Symbiosis</i>
Tue May 28	<i>Coral II Calcification, pH regulation, bleaching</i>
Thu May 30	<i>Bone-eating Osedax worm, Acid secretion, symbiosis</i>
Tue June 4	<i>Hagfish feeding strategies, slime production</i>
Thu June 6	Review Session
	FINAL EXAM (TBD)