

Syllabus: Marine Biochemistry (SIO 181)

Instructors

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Office hours:

By appointment

Time (Lectures):

Tuesday & Thursday 11.00 - 12.20 pm

Location (Lectures):

Mandeville B-150

Time (Seminars)

TBD Monday 4-5 pm ; Wednesday 5-6 pm

Location (Seminars)

TBD Vaughn Hall 100

Final Exam:

Tuesday June 9, 11.30 am-2.30 pm (location?)

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),
- Biomineralization (calcium carbonate, silica, etc)
- Symbiosis (in corals, mollusks, worms)
- pH regulation (all organisms)
- osmoregulation (osmoconformers, osmoregulators).

The students should also become familiar with the most important biochemical and physiological adaptations that are characteristic for diatoms, corals, oysters, deep-sea worms, sea urchins, hagfish, lampreys, sharks and bony fish.

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

Tue March 31	MT1	Intro
Thu April 2	MT2	Metabolism
Tue April 7	MT3	Anaerobiosis (guest lecturer Dr. Felbeck)
Thu April 9	MT4	Hypoxia
Tue April 14	MT5	ATPases, Carbonic Anhydrases, pH regulation
Thu April 16	MT6	ATPases, Carbonic Anhydrases, pH regulation
Tue April 21	MT7	Thermal Strategies in the Marine Environment (guest lecturer Dr. Wegner)
Thu April 23	MT8	Symbiosis (guest lecturer Dr. Felbeck)
Tue April 28	MT9	Corals <i>Symbiosis, calcification, pH regulation, nitrogen metabolism, in vitro research approaches, bleaching.</i>
Thu April 30	MT10	Bone-eating <i>Osedax</i> worms
Tue May 5	MT11	<i>MIDTERM</i>
Thu May 7	MT12	Hagfish <i>Osmoregulation, acid/base regulation, slime production, feeding.</i>
Tue May 12	MT13	<i>Sharks and bony fish osmoregulation</i>
Thu May 14	MT14	Pharmacognosy & biomimicry (guest lecturer Dr. Rapoport)
Tue May 19	MH15	Intro Biomineralization
Thu May 21	MH16	Marine Biomineralization: Silica
Tue May 26	MH17	Marine Biomineralization: Calcium carbonate
Thu May 28	MH18	Marine Biomineralization: Bone formation
Tue June 2	MH19	Biodiesels
Thu June 4	MT20	Review Session
Tue June 9	MH21	<i>FINAL</i>

Annelids *Worms from hydrothermal vents and whale falls.*

Note: 80-minute lectures

Quarter begins Thursday March 26, ends Friday June 12.

Final Exams: Saturday-Friday June 6-12.

Lecturer

MT=Martin Tresguerres

MH=Mark Hildebrand