

BIOL 586 [2] Fall 2020 - Marine Ecology Laboratory

Tuesday 12:30 PM - 03:15 PM

Instructor: Dr. Kaho Tisthammer

Contact: ktist@sfsu.edu

Office Hours: Tuesday and Thursday by appointment. For all class matters please e-mail me at the address listed above.

Course Description & Objectives:

This is a virtual (online) marine ecology laboratory course, covering the basic concepts applicable to marine ecological studies. Marine ecology involves a variety of factors that influence the abundance, distribution, and diversity of organisms, including the anthropogenic stressors. This course is designed to familiarize students with different study and experimental methods and techniques used in marine ecology, while learning key ecological concepts and scientific hypothesis testing. Because it is a virtual class, we will use videos and photos as much as we can to expose you to 'hands-on' experience.

Students will also engage in an independent research project, in which they develop their own research question and methods. Students will report their project idea and progress orally, and the final results orally as well as a written report.

The major goals of this course are to :

- Understand ecological concepts about marine coastal habitats
- Learn key factors structuring marine communities
- Find, understand, and discuss relevant literature and incorporate scientific papers into independent learning
- Design an experiment that tests a hypothesis about a pattern or process.

Given my background (coral reef biologist), we will likely use many examples from tropical marine habitats ☺.

Course Format:

Combined synchronous and asynchronous: We will meet every Tuesday synchronously at 12:30 via Zoom at:

<https://sfsu.zoom.us/j/96974203955?pwd=eDdXMno5NHhwK0paeXBucnR6V1Mydz09>

We will meet at least for an hour each week (some weeks may be longer or shorter). Students will then study the assigned topics/homework/readings each week asynchronously. Remember, this is a 2-unit laboratory course, and the assignments will reflect this.

Required textbook:

“*Marine Ecology: Processes, Systems, and Impacts*” by Michel J Kaiser, Martin J Attrill, Simon Jennings et al. Oxford University Press. The 2nd edition is the current one, but any editions are ok.

The textbook will be used as a guide to cover fundamental concepts. We will have additional readings, including primary literature, all of which will be provided at iLearn.

Assignments and Grading policy:

Assignments:

- 10 Weekly assignments: Students complete weekly assignments, and submit them via iLearn. Most assignments are due within one week (by Monday midnight).
- 1 Mini lab report : Students write a report in the format of a scientific paper.

- Research project: A written report is due at the end of the semester.

Evaluation:

150 points: Weekly evaluation (10 points each), including attendance and positive participation, discussion preparation, peer review activities

200 points: Weekly assignment (20 points each)

50 points Lab report (50 points)

50 points: Project proposal (oral)

50 points: Project progress report (oral)

100 points: Project final report (oral and written)

Total 600 points

Research project: An important component of this course is a research project that YOU will design, conduct/propose, and communicate as an oral presentation and a written report.

You can choose one of the two formats:

(1) Scientific paper: Students conduct an experiment or use available data (e.g. obtain data from a data repository), analyze the data, and summarize the findings. The written format

should follow a scientific paper with 1) Abstract, 2) Introduction, 3) Methods, 4) Results, 5) Discussion (+ Conclusion as optional).

(2) Research proposal: Students develop questions and detailed methods, and write; 1) Abstract, 2) Introduction/Background, 3) Proposed methods, 4) Anticipated results, 5) Research significance. The goal is to make your project funded!

Your project can be related to any topic in marine ecology, but it is expected to be original and independent. Begin thinking right away about what your project might entail. There will be checkpoints intended to allow you to receive feedback throughout the process.

1. Oral presentation of your proposed project idea - September 22, 2020
2. Oral presentation of your project progress - November 3, 2020
3. Oral presentation of your final project results - December 8, 2020

An infinite amount of DNA sequences are available at NCBI GenBank, and various data are deposited to open data-depository sites, such as Dryad (<https://datadryad.org/stash>) and figshare (<https://figshare.com/>).

Disclosures of Sexual Violence (Title IX)

SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the Dean of Students. To disclose any such violence confidentially, contact:

- The SAFE Place – (415) 338-2208; psyservs.sfsu.edu/content/safe-place
- Counseling and Psychological Services Center – (415) 338-2208; psyservs.sfsu.edu

Disability Access

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The [Disability Programs and Resource Center](#) (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email to dprc@sfsu.edu.

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Schedule (Note: The schedule is subject to change. Modifications will be posted on iLearn or given in class.) (Readings are due before the class.)

	Date	Topic	Assignments
1	8/25/20	<ul style="list-style-type: none"> • Introduction • Our Water Planet • Talk about the research project • Data repositories 	<ul style="list-style-type: none"> • Written assignment1
2	9/1/20	<ul style="list-style-type: none"> • Water sampling instruments and census methods 	<ul style="list-style-type: none"> • Written assignment2 • Reading: Textbook Chap1
3	9/8/20	<ul style="list-style-type: none"> • Planktons • Plankton tow • Microscope 	<ul style="list-style-type: none"> • Written assignment 3 • Reading: Textbook Chap1
4	9/15/20	<ul style="list-style-type: none"> • Marine biodiversity • Taxonomic classification • Intro to Metazoan 	<ul style="list-style-type: none"> • Reading: "Invert Guide" by Jonathan Fingerut (pdf)
5	9/22/20	<ul style="list-style-type: none"> • Project proposal (Oral) • Intro to corals & coral reefs! 	<ul style="list-style-type: none"> • Written assignment 4
6	9/29/20	<p>Virtual field trip to the Kewalo Marine Laboratory (Ms. Alex Barkman)!</p> <ul style="list-style-type: none"> • Marine habitats: Coral reefs 	<ul style="list-style-type: none"> • Written assignment 5 • Reading: Chap 10
7	10/6/20	<p>Marine habitats: Coral reefs</p> <ul style="list-style-type: none"> • Symbiosis • <u>Guest Speaker</u> -Dr. Lori Ling, Stanford University 	<ul style="list-style-type: none"> • Written assignment 6 • Reading: Roth, M, 2014 (pdf) "The engine of the reef: photobiology of the coral–algal symbiosis"

8	10/13/20	Virtual field trip to the Mote Marine Laboratory (Dr. Aileen Maldonado)!	<ul style="list-style-type: none"> • Written assignment 7 • Reading: Richmond 2014 (pdf) " Making science matter- Forging effective partnerships for coral reef conservation"
9	10/20/20	Invasive species presentation Climate change & anthropogenic impacts <ul style="list-style-type: none"> • Ocean Acidification 	<ul style="list-style-type: none"> • Written assignment 8 (presentation preparation) • Reading: Assigned papers for each group
10	10/27/20	Climate change <ul style="list-style-type: none"> • Sea level rise Review on data analysis/stats Intertidal System	<ul style="list-style-type: none"> • Reading: Textbook Chap 5 • Virtual intertidal field trip & Mini Lab Report (Due in 2 weeks on 11/10/29)
11	11/3/20	Project progress report Marine habitats: Deep Sea	<ul style="list-style-type: none"> • Reading: Textbook Chap 8
12	11/10/20	Marine habitats: Temperate communities (Dr. Sarah Cohen)	<ul style="list-style-type: none"> • Written assignment 9 • Reading
13	11/17/20	Virtual field trip to the EOS Center & San Francisco Bay National Estuarine Research Reserve (Ms. Anna Deck)	<ul style="list-style-type: none"> • Written assignment 10 • Reading: Textbook Chap 4
	11/24/20	Fall Break	
14	12/1/20	Ecotoxicology/Fisheries (TBD)	<ul style="list-style-type: none"> • Reading
15	12/8/20	Presentation of the Final Project	<ul style="list-style-type: none"> • Final project report (Due 12/11)