

BIO 124: BIOLOGICAL OCEANOGRAPHY, Fall 2016

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Instructor's Office Hours (EBS 319): Tu & Thurs 10:30-12:30 or by appointment

Course Website: www.biosbcc.net/ocean (location of Syllabus, lecture notes, Study Guides)

Online Text (location of reading assignments):

<http://connect.mheducation.com/class/m-paddack-bio-124---fall-2016>

Note: This syllabus may adapt to our progress as a class – listen for announced changes & check your pipeline email & the course website frequently!

Wk of:	LAB: EBS 210 M/T/W/R 2:30 – 5:35pm	Lecture # (Date)	LECTURE: EBS 309 Tu & Th 12:45-2:05pm	Reading Homework Castro & Huber 10thed
Aug. 22	1. Water Sampling	1 (8/23)	Oceanography Intro; Scientific Method; Ocean Zones	Ch 1: 6-15 Ch 2: 33-36
		2 (8/25)	Water Properties & Challenges Dissolved Gases; Light; Pressure	Ch 3: 40-48
Aug. 29	2. Beach ecology Scientific articles OCEAN JRNL 1 DUE	3 (8/30)	LECTURE QUIZ 1 Marine Ecology; Food webs	Ch 10: 213-225
		4 (9/1)	Biology Basics	Ch 4: 64-71
Sept. 5	3. Water & Organisms Lab Quiz 1 (Labs 1-2) DUE: Project Topic	5 (9/6)	Salinity & Temperature	Ch 4: 72-76
		6 (9/8)	LECTURE QUIZ 2 Atmosphere & Ocean Circulation	Ch 3: 48-57
Sept 12	4. Currents, Waves, Beach	7 (9/13)	Reproduction in the ocean Natural Selection & Evolution	Ch 4: 76-83
		8 (9/15)	Phytoplankton; Picoplankton; Zooplankton introduction	Ch 5: 85-100 Ch 15: 336-340
Sept 19	5. Boat Trip	9/20	MIDTERM 1	
		9 (9/22)	Zooplankton; Life in the Epipelagic	Ch15: 340-350
Sept 26	6. Pigments DUE: Project Outline Lab Quiz 2 (Labs 3-5)	10 (9/27)	Epipelagic Adaptations II; DSL	Ch15: 350-352; 16: 372
		11 (9/29)	Nutrient Cycles; Productivity; El Niño – Southern Oscillation	Ch 15: 352-363
Oct. 3	7. Plankton Productivity	12 (10/4)	Marine Migrations	Ch 8:169-172 Ch 9: 206-208
		13 (10/6)	LECTURE QUIZ 3 Changing Planet	233-245
Oct 10	8. Ocean Acidification Due: Article Questions	14 (10/11)	Biodegradable marine pollutants	Ch. 18: 410-417
		15 (10/13)	Persistent Marine Pollutants	Ch. 18: 417-21
Oct 17	9. Infauna Lab Quiz 3 (Labs 6-7)	16 (10/18)	Invasive Species; Trash Gyres	Ch 18: 421-423
		17(10/20)	Polar oceans Marine mammals	Ch 13: 292-293; Ch 9: 188-190
Oct 24	10. Adaptations	10/25	MIDTERM 2	
		18 (10/27)	Tropics; Coral reefs	Ch 14: all
Oct 31	11. TERM PROJECTS	19 (11/1)	Coral reef ecology	
		20 (11/3)	Soft-sediment ecosystems	Ch 13: 289-297
Nov. 7	12. Settlement Plates Lab Quiz4 (Labs 9-11)	21(11/8)	LECTURE QUIZ 4; Kelp Forest Ecosystems	Ch 13: 300-309
		22 (11/10)	Fisheries	Ch 17:387-404
Nov 14	13. Rocky Intertidal (Carpinteria fieldtrip) OCEAN JRNL 2 DUE	23 (11/15)	Tides Rocky Intertidal	Ch 3: 57-62 Ch 11: 246-263
		24 (11/17)	Bioluminescence; Mesopelagic	Ch 16: 365-376
Nov 21	14: Review for lab final	25 (11/22)	LECTURE QUIZ 5; Deep sea	Ch 16: 376-383
		11/24	Thanksgiving Holiday	<i>Relax ☺</i>
Nov. 28	LAB FINAL EXAM Review for lecture final	26 (11/29)	Hydrothermal Vents & Cold Seeps	Ch 2: 36-38; 54 Ch 16: 383-385
		27 (12/1)	Ocean Future & Frontiers	Ch 18: 424-429

➤ **LECTURE FINAL EXAM: THURS DEC. 8th from 11:00am – 1 pm IN EBS 309**

Required Materials:**Textbook (required):** Marine Biology, by Castro & Huber, 10th edition – **online access required****Lab book (required):** Biological Oceanography Lab Manual, Paddock & Anderson, 2016.

Welcome to Biological Oceanography! This course is an introduction to the amazing world that awaits you just offshore. It is designed for non-majors in science but will also be valuable for biology majors interested in marine science.

In this class, we will be learning about the connections between the physical environment of the oceans and marine organisms, focusing on biological adaptations and ecology. We will be working with these concepts in both lecture and lab. The lab is your chance to put your learning into action, proving concepts for yourself and using tools & skills used by oceanographers worldwide to study the marine realm.

My goal is to help you discover how the oceans influence life on Earth, including your own. Along the way, you will better understand biology and ecology as you discover the many connections you have with the ocean and develop the ability to integrate scientific literacy and thinking into your daily life.

This course satisfies the SBCC general education requirement in Natural Sciences and is transferable to both UC and CSU as a general education laboratory science course. This course does not apply toward the Biology major at SBCC.

Student Learning Outcomes (SLO's) for Bio124 Biological Oceanography:

1. Physical: Summarize the major physical aspects of the oceans (salinity, temperature, dissolved oxygen, nutrients, pH), how each one varies or does not vary, and how each one affects marine life (geographically and/or seasonally).

2. Adaptations: Describe basic adaptations that occur in marine pelagic organisms to facilitate buoyancy, migrations, and reproduction.

3. Communities: Compare and contrast marine benthic communities in tropical, polar, and deep-sea marine environments.

4. Lab: Recognize the major pieces of oceanographic equipment, what each one samples or measures, and what the sample or measurement can tell about the ocean.

GRADING will be determined by the total percentage earned in the course. There is one letter grade for this 4 unit class (lecture and lab together) which will be based upon your percentage of points earned out of a possible 1,000 points using the following scale. A student who shows strong effort and/or improvement in the course may be bumped up into the next higher level at my discretion.

A+: >97%	A: 93-96.9%	A-: 89.5-92.9%
B+: 87-89.5%	B: 83-86.9%	B-: 80-82.9%
C+: 75-79.9%	C: 70-74.9%	
D+: 67-69.9%	D: 63-66.9%	D-: 60-62.9% F: <60%

Students taking pass/no pass must get at least 67 to pass the class.

Points are earned as follows:

Lecture Activities	Pts	% of grade	Lab Activities	Pts	% of grade
Reading Assignments (10 @ 7 pts each)	70	8%	Lab Exercises (14 @ 10 pts ea)	140	14%
Lecture Quizzes (6 at 10 pts each – drop lowest)	50	5%	Lab Quizzes (4 at 10 pts each – drop lowest)	40	4%
Midterm 1	100	10%	Ocean Journals (2 @ 10 pts ea)	20	2%
Midterm 2	100	10%	Acidification Worksheet	50	5%
Midterm 3	100	10%	Project topic (on-time)	5	.5%
Lecture Final	100	10%	Project Outline	10	1%
Participation (Lecture & Lab)	55	5%	Project	100	10%
			Lab Practical Exam	100	10%
			Lab Manual	10	1%

NOTE: 10% per day late will be deducted from grades for all late assignments

Extra Credit opportunities will be offered throughout the semester and announced in class. If you hear of an activity/lecture/etc that you think would be a valuable learning experience, let me know. All extra credit opportunities will be no cost, or a no cost option will be available.

Here are some Extra Credit opportunities you will have the opportunity to do:

1. News Flash: If you read or hear a news article about the ocean environment, share it with the class (a quick summary). You may do up to 3 of these (3 points each).
2. Local scientific lectures/films (will be announced). Worth 5 points each.

For any lecture/presentation you attend, you must hand in:

- a) the notes you took during the lecture;
- b) a brief summary of the lecture/presentation;
- c) 2-3 sentences of your thoughts/reaction/questions

Participation: A key element of the sciences is to be inquisitive and interactive with your subject and your peers. Your participation is therefore an important part of your learning, so is a part of your grade. Do not be afraid to ask questions or to seek help in understanding from your instructor or your peers – discussion & debate are important aspects of science. **I encourage you to ask questions in class.** If you don't understand something, it is most likely that someone else in the class shares your confusion. The easiest way to resolve your misunderstanding is to speak up.

All science classes build on the foundations laid in each lecture, so it is important that you *do not get behind*. Text readings will support the lecture material, but additional material WILL be presented in lectures. Therefore, if you are absent, it is important that you get class notes from a classmate.

Tardiness/Absences: Please be on time! Coming in late is confusing for you and disruptive for the class. If you miss more than 3 lectures &/or 2 labs you are subject to being dropped.

Lecture Quizzes: There will be a total of 6 lecture quizzes/in-class work – 5 quizzes are scheduled and 1 is a 'pop' in-class work. Scheduled quizzes will be closed-book on material from the previous 2 lectures. Your lowest lecture quiz score will be dropped or considered extra credit. Make-ups ONLY with a documented valid absence (e.g., doctor's note).

Exams will be a combination of scantron & short answer. Each mid-term will cover material up to the test. The final exam will be half material from the last third of the class and half cumulative.

No exit/re-entry allowed during exams, so be sure that you use the restroom prior to the exam.

You must bring a #2 pencil and 100 question scantron form to each exam.

NOTE THE TIME OF THE FINAL (11-1) differs from the regularly scheduled lecture time!

ASSIGNMENTS:

Reading Assignments

Access to the online text is **required**. This will provide you with helpful tools to succeed in this class. There will be reading assignments each week. As you do the reading assignments, the online system will 'quiz' you to help ensure you understand the material. You will receive a full score for each assignment as long as you complete all of the questions, regardless of how many are correct. I will be able to see your progress and to see which topics require more explanation and in-class discussion. Instructions for logging into your text are on the last page of this syllabus.

Reading assignments are due on Monday of each week, based on the readings for the previous week. I recommend, however, that you do the assignments in time to prepare you for the week for the week to come.

There will be a reading assignment for each week, but only 10 will be required, so you may choose which ones to do. Any ones that you do beyond the required 10 will be considered extra credit (and will help you greatly!).

Ocean Journals are 2 short outside assignment (literally). You will be required to write an essay that includes at least 2 journal entries and an analysis. Each journal entry will be based upon a minimum of 20 minutes spent outside of class/lab during the semester where you take time to simply observe

whatever aspects of the ocean interest you (e.g., the waves, particular marine organisms, tide pools, etc.) The details for this exercise can be found in your lab manual under the tab "Ocean Journal".

Term Project will be a short, formal presentation on the biology and/or ecology of any aspect of biological oceanography. You will work on and present your project in lab. A list of suggested topics will be provided on the class website, or you may come up with your own idea. Your topic must be based upon published scientific studies. Topics & outlines must be cleared with the instructor - only one student can write on each topic so sign up early.

The project will be an oral 8 minute (solo) or 15 min (buddy team) presentation - each team member must take part in the oral presentation. This will provide you with valuable presentation and collaborative skills as well as help to teach each other about the interesting topics you have researched.

Although the presentation is oral, you are required to submit in printed form your topic, outline, an annotated bibliography, and an abstract prior to the presentation date (see syllabus). The format of the presentation is your choice – PowerPoint is recommended as it is a tool you will use again & again, but you are welcome to use any other format (e.g., overheads, the blackboard, a poster, an artistic representation), as long as you are able to convey the information to the class in a meaningful, understandable, & engaging way. On the day of your presentation, you must bring in a printed abstract and bibliography. Your sources must include of at least 1 peer-reviewed scientific article.

Be sure you understand the difference between a peer-reviewed, scientific article and one written for the public.

Do not try to read an article that you do not understand. Periodicals are available in our library both electronically and in print- new ones are in the mezzanine and older ones are in the stacks (often bound in volumes). Take advantage of our amazing librarians at the Luria library for help on finding articles. Some excellent, on-line scientific journals which provide free on-line access to some or all articles include: Marine Ecology Progress Series, Journal of Marine Biology, Current Biology, Bioscience, Ca. Fish & Game Bulletin, Science, Nature, PLoS ONE and PLoS Biology.

Your lab manual contains format instruction sheet, rubric, and in-class pointers.

Lab Quizzes- will be given during the first 10 minutes of each lab in which they are scheduled. They will cover lab material from the previous labs as well as test your preparedness for the lab you are about to do (read over your labs BEFORE class!). Students who are late will not have time extended for quizzes. Make-ups will be given only with a valid doctor's note. The lowest scoring quiz will be dropped.

Lab Exercises-- Your lab notebook has all of the labs you will do (with the exception of week #1, which will be passed out in the first lab). It is your responsibility to bring your lab notebook to class. Students who forget their printed labs will receive no higher than a 10/15 on that lab. Lab exercises are to be completed during the laboratory period and turned in or checked over before leaving.

Your role in this class: Congratulations on taking the initiative to learn a fascinating subject! This will be a class that will have you interacting directly with the things we are studying, and with each other. We will provide great tools for you to learn, but it is ultimately YOU who is responsible for your knowledge. If you need extra help, come to my office or make an appointment - I am here for YOU.

Respect your fellow classmates and instructor: **No cell phones, laptops, mp3s, I pads, Kindles, etc during class without prior permission from the instructor.** Any student who causes any disruption, such as using the above items or talking out of turn, will be given a single verbal warning and points will be deducted from participation grade. If the disruption continues then or any following classes, the student may be removed from class & will not be able to return until meeting with the Academic Dean. Accommodations for Students with Disabilities:

Disabled Student Programs & Services (DSPS) www.sbccc.edu/dsps

coordinates all academic accommodations for students with documented disabilities at Santa Barbara City College. If you have, or think you might have, a disability that impacts your educational experience

in this class please contact DSPS to determine your eligibility for accommodations. DSPS is located in the Student Services (SS) Building, Room 162. Their phone number is 805-730- 4164.

If you are already registered with DSPS please submit your accommodation requests via the 'DSPS Online Services Student Portal' as soon as possible. Once submitted and confirmed please visit with me about your specific accommodations.

Please complete this process in a timely manner to allow adequate time to provide accommodation.

I do not post grades but will check in with you periodically. It is important that you keep track of how you are doing in class. Below is chart to help you keep track of your grades. Record your grade for each assignment in the 'Points earned' column. To calculate your grade at any time in the semester, add up all of the points you have earned so far plus all Extra Credit earned. Divide this number by the total of all of the maximum points for those assignments (but not Extra Credit). Multiply this number by 100 for your % score. Remember that you can drop your lowest lecture quiz and lowest lab quiz scores.

Lecture Activities	Points offered	Points earned	Lab Activities	Points offered	Points earned
Online reading 1	5		Ocean Journal 1	20	
Online reading 2	5		Ocean Journal 2	20	
Online reading 3	5		Lab 1	10	
Online reading 4	5		Lab 2	10	
Online reading 5	5		Lab 3	10	
Online reading 6	5		Lab 4	10	
Online reading 7	5		Lab 5	10	
Online reading 8	5		Lab 6	10	
Online reading 9	5		Lab 7	10	
Online reading 10	5		Lab 8	10	
Online reading 11	5		Lab 9	10	
Online reading 12	5		Lab 10	10	
Online reading 13	5		Acidification Worksheet	10	
Online reading 14	5		Lab 11	10	
Online reading 15	5		Lab 12	10	
Lecture Quiz 1	10		Lab 13	10	
Lecture Quiz 2	10		Lab 14	10	
Lecture Quiz 3	10		Lab Quiz 1	10	
Lecture Quiz 4	10		Lab Quiz 2	10	
Lecture Quiz 5	10		Lab Quiz 3	10	
Lecture Quiz 6	10		Lab Quiz 4	10	
<i>Drop lowest quiz</i>			<i>Drop lowest quiz</i>		
Midterm 1	100		Project Topic	5	
Midterm 2	100		Project Outline	10	
Midterm 3	100		Term Project	100	
Final	100		Lab Practical	100	
Participation	50		Lab Manual	10	
Extra Credit			Extra Credit		
Extra Credit			Extra Credit		
Extra Credit			Extra Credit		
Grand TOTAL					

Student Instructions: Register and Sign In

1. Go to <http://connect.mheducation.com/class/m-paddack-bio-124---fall-2016>
2. After confirm the course and instructor information displayed on the right side of the screen, click "Register Now".
3. Enter your e-mail address.
4. If you are a new user, you'll see three options:
 - a. If you already received an access code with your new text OR if you purchased an access card from your bookstore, enter your code in the appropriate field and click "Submit".
 - b. If you don't have a code yet, click "Buy Online" to purchase one with a credit card.
 - c. Not ready to purchase yet? Try Connect for free for two weeks by clicking on "Courtesy Access".
5. Fill out the registration form.
6. Once you have completed and submitted the form, you can access your Connect homepage by clicking on "**Go To Connect Now**"
7. At your Connect homepage you can access your assignments, study center, grades, and other resources provided by your instructor. Start by clicking any of the assignment titles displayed on the list.