

Instructional Team:

Instructor:

Dr. Karla Heidelberg
Office Hours: TH 11:00-12:00 or 2:00-3:00
Location: SOS B15
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Dr. Naomi Levine
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Location: AHF M225
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Textbooks: Lecture: David Townsend, 2012, *Oceanography and Marine Biology: An Introduction to Marine Science*
Laboratory: Materials provided

Website: <https://blackboard.usc.edu>
(site for course materials, lecture notes, quizzes, additional readings, grades etc.)

Lecture times: T/Th 9:30- 10:50am (two lectures per week) THH 118
Laboratory time: Th 3:00 - 6:00pm (one lab per week)

Course Overview

This course will cover the basics of biological, physical, and chemical dynamics in the oceans with a particular emphasis on life in different ocean environments. Specific topics include primary production of phytoplankton, secondary production by zooplankton, bacterial remineralization, physiology and ecology of fishes, and marine mammals.

Prerequisites: BISC 120 or 120; BISC 220 or 221 (*students with BISC 103 can request prerequisite waiver*).

General objectives of the course

Through lectures, laboratories, and projects you will gain experience toward some of the general curricular goals of the university as related to Biological Oceanography: (1) the ability to think logically, analytically, and independently; (2) the ability to communicate clearly and effectively, both orally and in writing; (3) the ability to learn on one's own and as part of a group; and (4) in-depth of knowledge in a specific sub-discipline of marine biology.

Schedule of lecture topics (*subject to modification of specific topics and reading assignments*):

Day	Activity		Readings
T Aug 25	Lec 1 Introduction to the marine environment	KH/NL	TBD
Th Aug 27	Lec 2 History of Oceanography	KH	Ch 1
T Sept 1	Lec 3 Geology I: Earth's structure and plate tectonics	NL	Ch 2
Th Sept 3	Lec 4 Geology II: Weathering, sediments, paleoceanography	NL	Ch 3
T Sept 8	Lec 5 Water chemistry and properties of water	NL	Ch 4
Th Sept 10	Lec 6 General circulation in the oceans	NL	Ch 5
T Sept 15	Lec 7 Tides and Waves	KH	Ch 6
Th Sept 17	Lec 8 Nutrient cycles and limiting factors	NL	Ch 7
T Sept 22	Lec 9 Life at sea (photosynthesis and light)	NL	Ch 7
Th Sept 24	Lec 10 Primary production and primary producers	NL	Ch 8
T Sep 29	MIDTERM I (Lectures 1-10)		
Th Oct 1	Lec 11 Observing the oceans (satellites and other tools)	NL	TBD
T Oct 6	Lec 12 Modeling the ocean system	NL	TBD
Th Oct 8	Lec 13 Oceanic bacteria and archaea	KH	Ch 8
T Oct 13	Lec 14 Hydrothermal vent systems /Hydrocarbon seeps	NL	Ch 12
Th Oct 15	Lec 15 Grazers (secondary production and producers)	KH	Ch 9
T Oct 20	Lec 16 Benthic environments	KH	Ch 10
Th Oct 22	Lec 17 Ocean Acidification and its impacts	NL	TBD
T Oct 26	Lec 18 Case Study: Deep Horizons oil spill	NL	TBD
Th Oct 29	MIDTERM II (Lectures 11-18)		
T Nov 3	Lec 19 Food webs	KH	TBD
Th Nov 5	Lec 20 Larval Ecology and transport	KH	TBD
T Nov 10	Lec 21 Fisheries	KH	Ch 11
Th Nov 12	Lec 22 Perfect Storm: a case study for oceanography	KH	Book excerpts
T Nov 17	Lec 23 Human impacts on the ocean environments	Guest	
Th Nov 19	Lec 24 <i>NO CLASS (Wrigley weekend make-up)</i>		
T Nov 24	Lec 25 Human impacts on the ocean environments	KH	Ch 15
Th Nov 26	THANKSGIVING		
T Dec 1	Lec 26 El Niño	KH	Appendix B
Th Dec 3	Lec 27 Future of Oceanography/ Review	KH	TBD
Th Dec 10	FINAL EXAM 11:00-1:00		

The above schedule is tentative and is subject to change. Any schedule changes will be discussed in class and posted on Blackboard. Students who miss classes are responsible for finding out about announcements.

LAB SCHEDULE (*subject to modification of specific topics and assignments*):

Day	Activity		Assignments/Comments
Week 1 Aug 27	NO LABS WEEK 1		
Week 2 Sept 3	Lab 1 Species identification lab	KH	Worksheet 1 (10 pts)
Week 3 Sept 10	Lab 2 Seawater density lab	NL	Worksheet 2 (10 pts)
Week 4 Sept 17	Lab 3 Geology lab	NL KH	Worksheet 3 (10 pts)
Week 5 Sept 24	Lab 4 Nutrients lab – <i>Ballona Wetlands Fieldtrip (afternoon only)</i>	NL KH	Lab Report (35 pts)

Week 6 Oct 1	Lab 5 Pigments lab and phytoplankton identifications	NL/ KH	Worksheet 4 (10 pts)
Week 7 Oct 8	Lab 6 NO LAB (<i>Wrigley weekend make-up</i>)		
Oct 15	Lab 7 Boundary layers; Water flow and feeding	KH	Worksheet 5 (10 pts) Lab presentation outline due (10 pts)
Oct 16 th -18 th	<i>USC Wrigley Institute for Environmental Studies (Friday night departure; Sunday midday return)</i>		Lab write up (35 pts)
Week 8 Oct 22	Working with Data: SPOTs analysis and Group Wrigley lab data workup/ tips on presentations	NL/ KH	
Week 8 Oct 29	Lab 8 Ocean acidification lab	KH/ NL	Worksheet 6 (10 pts)
Week 9 Nov 5	Lab 9 <i>California Science Center visit/assignment (afternoon only)</i>	KH	Worksheet 7 (10 pts)
Week 10 Nov 12	Lab 10 Presentations I	KH	Presentation (40 pts)
Week 11 Nov 19	Lab 11 <i>Ferman Point field trip (afternoon only)</i>		Worksheet 8 (10 pts)
Week 12 Nov 26	THANKSGIVING		
Week 13 Dec 3	Lab Final		Final 50 points

Quizzes and Exams

Lectures: There will be two lecture exams (200 pts each), and 11 lecture quizzes given through Blackboard or by handout (10 pts each; only 10 counted in final grade). Questions on quizzes and exams will be a combination of multiple choice, short answer, problem sets, fill in the blank and essays.

All exams will be held in our regular lecture room. THERE WILL BE NO SCHEDULED MAKE-UP EXAMS. If you have any anticipated problem due to athletic schedules or religious holidays see one of the instructors by WEEK 2 of the course.

Reviews of primary literature

Additional readings for specific lectures or labs may be posted on Blackboard during the semester. Some lecture quiz points may be allocated to a paper review.

Labs:

Laboratory activities will include outdoor activities, bench side experiments and computer-based modeling activities. These activities will emphasize how the ocean works and how marine biologist test their ideas, through quantitative observations, models, and manipulative, controlled, and replicated experiments.

Some labs will be in the field. Working outdoors is a great way to see organisms in their natural habitats. Plan to dress appropriately for each proposed activity and bring water. **There are four field trips**, three of which fall within the normal lab time.

Additional information:

The final letter grade will be assigned on a curve, determined by the total number of points as follows:

Lecture:

Midterm Exams x 3 (200 each) 600 pts

Lecture Quizzes x 10 (10 pts each) 100 pts

LECTURE TOTAL 700 pts

Laboratory:

Full Lab Reports x 2 (35 pts each) 70 pts

Worksheets x 8 (10 pts each) 80 pts

Special topics presentation outline 10 pts

Special topics presentation 40 pts

Prelab questions x 8 (5 pts each) 40 pts

Leadership/Participation 10 pts

Lab Final 50 pts

LAB TOTAL 300 pts

CLASS TOTAL 1000 pts

GENERAL GRADING SCALE

90 - 100% A

80 - 89% B

65 - 79% C

55 - 64% D

0 - 54% F

Course Policies

Any document associated with grading may be photocopied by the instructional staff.

Exams

The lecture portion of this course will include three midterm exams (Midterm 3 is the Final). Exams may include multiple choice questions, fill-in answers, definitions, T/F, short answers, and short or long essays. Material will be drawn from lectures, reading, laboratory material, and problem set material. The final will focus heavily on the third portion of the exam, but may also have cumulative questions.

Policy on Re-grading Examinations

If you feel that an error was made in the grading of an examination, you need to do the following: 1) Check the posted answer key, 2) Prepare a printed statement explaining why you feel your grade was incorrect, and 3) submit this and your original examination to your instructor within one week of the time the examination was returned to you. Your entire exam may be re-graded and, as a result, your grade may increase or decrease from a requested re-grade. No frivolous reasons will be accepted for requesting grade changes; stated reasons for a grade change must be legitimate (e.g., error in totaling the score).

Late work

All late assignments must be turned in to the instructor personally. Late assignments will be penalized 10% of a grade per day.

Class participation

Since this course will be interactive and will require you to work closely with others, part of your grade will be dependent on your ability and willingness to participate in class discussions and laboratory investigations, as well as interact positively with other members of the class. Students are also expected to be on time and have active participation in all field trip activities.

Policy on Missed Lecture Exams, Quizzes or Lab activities or Lab Exams

UNPLANNED ABSENCES: The general University policy is that you may be excused from an exam or labs only in the event of a documented illness or emergency as outlined by university policy. If

you miss a class or lab exam, quiz or graded activity due to medical illness you must present a valid medical excuse within 48h of the missed exam or graded event. The reason for missing an examination or quiz must be of a medical nature or totally unavoidable (e.g., a verified automobile collision on the day and time of the examination). Remember that the USC Student Health Center does not provide routine medical excuses. Notify the Instructor in writing that you were seen by a physician, making sure that you include: 1) the physician's name and telephone number, and 2) a statement authorizing us to discuss with the doctor whether you were too ill to take the examination. Note that neither you nor the physician need tell us the nature of your illness. If the excuse is valid, we will accommodate needs. If you miss the final examination and have provided a valid medical excuse within 72 hours of the examination time, a final course grade of incomplete (IN) will be recorded and you will be permitted to take a make-up final examination during the following semester.

PLANNED ABSENCES: Students who wish to miss an examination for observance of a religious holy day should be aware of the University's policy on such absences, published at: <http://orl.usc.edu/religiouslife/holydays/absences.html>. Requests for such absences should be made by email to the Instructor at least *2 weeks in advance* of the absence, although notice at the beginning of the semester is better. If the absence is approved, a reasonable accommodation will be provided.

Students with Disabilities

Students requesting academic accommodations based on a disability are required to register with the Office of Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Be sure that the letter is delivered as early in the semester as possible. DSP is located in STU 301 and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. The telephone number of DSP is 213-740-0776. If a student's approved accommodation is limited to extra time on examinations, accommodation will be provided. For any other accommodation, such as a private room, translator, etc., students must make prior arrangements with the DSP office *2 weeks before* the exam date. For more information please visit the following website: http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html.

Statement on Academic Integrity

Ethics of academic integrity is a primary focus of the course. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00: <http://web-app.usc.edu/scampus/1100-behavior-violating-university-standards-and-appropriate-sanctions/>, while the recommended sanctions are located in Appendix A. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>. It is a violation of academic integrity to either use someone else's clicker in the classroom to assist that person in gaining points, or lend your assigned clicker to another student.

Website

Postings on Blackboard (<https://blackboard.usc.edu>) will be an official source for announcements, course materials, lecture notes, grade postings and general discussions. We may also use Blackboard for lecture or laboratory quizzes. Students are responsible for checking the course website on a regular basis.

Laboratory Performance guidelines

1. You are required to attend all lab sessions. Any unexcused absences or early departures will seriously affect your evaluation. Come to lab on time. You are also to remain for the entire lab session or until excused by your instructor. At the end of the lab session, clean and return all supplies to their proper place, and clean your work area. Check with your instructor before leaving. **NO EATING OR DRINKING IS ALLOWED IN THE LABORATORY.**

If you have to miss a lab for a legitimate reason, we will prorate your grade for that lab based on other grades of comparable points. If you miss a lab with a major write up, you will be assigned another lab for a full write-up. Note that this may involve extra sampling work or analysis.

2. **PRE-LAB QUIZZES:** Each student will take a quiz during the first 5 minutes of each lab session. Students who come late to lab without a legitimate and verifiable excuse will not be allowed to make up the quiz. Quizzes will consist of multiple choice questions and/or fill-in-the-blanks.

3. **LAB WORK SUMMARIES OR WRITE-UPS:** During each lab students need to record their results (drawings, observations, calculations) in their lab notebook or provided worksheet. Tables need to be filled and all post-lab questions answered. Each student is required to show the lab workbooks whenever asked for spotcheck grades. We will cover details on lab requirements and expectations for each specific lab.

4. **LAB REPORTS:** Lab reports (x2) will be submitted using turnitin link on Blackboard and a hard copy turned in at the beginning of the lab session that it is due. Lab report guidelines will be posted on Bb (<https://blackboard.usc.edu/>).

5. **LAB FINAL:** The lab final will test your understanding of the topics and exercises covered in the laboratory sessions. You will have a written portion and a practical portion (being able to use a microscope to identify different organisms or a piece of equipment to determine a measurement).

6. **PRESENTATION:** Detailed instructions for preparing your presentation, including how points will be assigned, will be provided on Blackboard (<https://blackboard.usc.edu/>).

7. **BLACKBOARD:** Blackboard will be used to distribute course materials and announcements and grades. Lecture and lab grades will also be available on Blackboard: <https://blackboard.usc.edu>. It is the student's responsibility to notify his/her Instructor ASAP in the event of any mistakes, so please check your scores on Blackboard weekly.