

Instructor:

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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> (course associated materials and grades)

Lecture times: T/Th 2:00-3:20 (two lectures per week) VKC 256
Laboratory time: T 3:30 - 6:20pm (one lab per week) ZHS 469

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 knowledge of the sub-discipline of biological oceanography.

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

Day	Activity		Readings	Assignments
T Aug 27	Lec 1 Geology: Earth's structure, sediments, paleoceanography	NL	Ch 1	
Th Aug 29	Lec 2 The Bio in BioOce	CT		
T Sept 3	Lec 3 Water chemistry and properties of water Lab 1 Seawater density lab	NL	Ch 4	Worksheet 1
Th Sept 5	Lec 4 General circulation in the oceans	NL	Ch 5	Assignment 1
T Sept 10	Lec 5 Circulation 2 – OMZ physics <i>No lab Makeup for WMSC field trip</i>	CT		
Th Sept 12	Lec 6 Tides and Waves	CT	Ch 6	
T Sept 17	Lec 7 Energy for life 1: phototrophy Lab 2 Eunice lab	NL	Ch 8	Worksheet 2
Th Sept 19	Lec 8 Primary producers	NL	Ch 8	
T Sept 24	Lec 9 Energy for life 2: chemotrophy Lab 3 Respiration lab	CT	Journal article	Assignment 2 Worksheet 3
Th Sept 26	Lec 10 Observing the oceans	NL	Journal article	
T Oct 1	MIDTERM I (Lectures 1-9) <i>No lab Makeup for WMSC field trip</i>			
Th Oct 3	Lec 11 Nutrient cycles	NL	Journal article	Assignment 3
T Oct 8	Lec 12 Limiting factors Lab 4 Nutrient modeling/ Introduction to Stella	NL	Journal article	Worksheet 4
Th Oct 10	Lec 13 Microbial loop 1(Grazers & Carbon cycling)	CT	Journal article	
T Oct 15	Lec 14 Microbial loop 2 (Grazers & Carbon cycling) Lab 5 Stella ecosystem model Lab	CT NL	Ch 9	Final project topic due Worksheet 5
Th Oct 17	FALL BREAK			
T Oct 22	1 slide over-view of final project Lab 6: BioInformatics Lab 1			Worksheet 6
Th Oct 24	Lec 15 Omics approach to oceanography	CT	Ch 15	
T Oct 29	Lec 16 Dissolved Organic Carbon Lab 7: BioInformatics Lab 2	CT	Journal article	Worksheet 7
Th Oct 31	MIDTERM II (Lectures 10 - 16)			
Fri Nov 1 st – Sun Nov 3 rd	Wrigley Marine Science Center Weekend FIELD TRIP			Lab report
T Nov 5	Lec 17 Oxygen Minimum Zones Lab 8: WMSC data analysis	CT	Journal article	Assignment 4
Th Nov 7	Lec 18 Estuaries: physical structure; Watershed activity, biological structure	CT	Ch 8	
T Nov 12	Lec 19 Ocean Acidification and its impacts Lab 9: Ocean acidification lab	NL	Journal article	Assignment 5 Worksheet 8

Th Nov 14	Lec 20 Modeling the ocean system	NL	Journal article	
T Nov 19	Lec 21 History of Oceanography Lab 10: History lab	CT	Ch 3	Worksheet 9
Th Nov 21	Lec 22 El Nino	NL		
T Nov 26	<i>No class Makeup for WMSC field trip</i> <i>No lab Makeup for WMSC field trip</i>			
Th Nov 28	THANKSGIVING			
T Dec 3	Student Presentations Student Presentations			
Th Dec 5	Student Presentations		Final presentation and 5 page paper (not including references, need <u>at least 4</u> references)	
	FINAL EXAM			

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.

Assignments and Worksheets:

There will be 5 assignments given through Blackboard or by handout. Assignments and worksheets will be based on lab or lecture activities. Points for each are indicated in the table on page 5.

Assignment	Content	Assigned	Due	Notes
1	Ocean Circulation	9/5	9/12	Worksheet
2	Energy for life	9/17	9/24	Journal article and questions
3	Nutrient cycles	10/3	10/10	Journal article and questions
4	Oxygen Minimum Zones	11/5	11/12	Journal article and questions
5	Ocean Acidification	11/12	11/19	Journal article and questions

Exams

The lecture portion of this course will include three midterm exams, with exam 3 being 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, readings, laboratory material, and problem set material. The final will focus heavily on the third portion of the exam,

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

The University's policy on absences due to athletic schedules or religious holidays is published at: <http://orl.usc.edu/religiouslife/holydays/absences.html>. Requests for such absences should be made by email to the Instructor Team 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.

The weekend trip to Wrigley is a MANDATORY and important part of this course.

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. Notify the Instructor in writing that you were seen by a physician, making sure that you include the physician's name and telephone number. Note that neither you nor the physician need tell us the nature of your illness. 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.

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) Prepare a printed statement explaining why you feel your grade was incorrect, and 2) 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.

Final Project

Each student will choose a research topic from a list provided. The project will focus on a previous study done by a biological oceanographer and published in a peer-reviewed journal. The student will summarize this study and associated previous work that has been done on the topic and come up with a proposed "next steps" for a research study or experiment that would address unanswered questions related to the topic. Each student will prepare:

1. Bibliography of primary literature
2. 1-slide over-view of topic
3. Presentation
4. Paper

Further details of expectations regarding the final project will be posted on Black Board.

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 biological oceanographers test their ideas, through quantitative observations, models, and manipulative, controlled, and replicated experiments. Students will conduct group projects that will involve sampling and collecting data. Each student will submit a lab report, which includes a discussion of relevant primary literature and a data summary. Each group will discuss its findings in class.

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 is one field trip that falls outside of normal course time: a one weekend trip to Catalina Island.** Other labs fall within the normal lab time.

Grading:**Grading policies**

Late assignments will be penalized 10% of a grade per day. Any document associated with grading may be photocopied by the instructional staff.

Class		Assignments:	
Midterms x 3 (200 pts each)		Ocean Circulation (Assignment 1)	10
		Energy for life (Assignment 2)	10
		Nutrient Cycles (Assignment 3)	10
		Oxygen Minimum Zone (Assignment 4)	10
		Ocean Acidification (Assignment 5)	10
		Labs:	
		Seawater density (Lab 1)	15
'1-slide' presentation	15	Eunice Lab (Lab 2)	15
'1-slide' feedback	10	Respiration Lab (Lab 3)	15
Peer-review feedback	15	Nutrient modeling (Lab 4)	15
Final student presentation	50	Stella ecosystem modeling (Lab 5)	15
Final presentation feedback	15	BioInformatics #1 (Lab 6)	15
Final presentation paper	50	BioInformatics #2 (Lab 7)	15
		Ocean Acidification (Lab 9)	15
		History lab (Lab 10)	15
Exam totals	600	<i>WMSA write-up</i>	50
Class Assignments (x5) totals	50		
Lab Totals	185		
Final Project	155	Beginning of semester questionnaire/e-mail	4
Class questionnaires	10	End of semester eval completion	6
CLASS TOTAL	1000		

Class participation

Since this course will be interactive and will require you to work closely with others. We expect all students 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.

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

GENERAL GRADING SCALE

90 - 100%	A
80 - 89%	B
65 - 79%	C
55 - 64%	D
0 - 54%	F

Students with Disabilities

Students requesting academic accommodations based on a disability are required to register with the Office of Disability Services and Programs (DSP; 213-740-0076) each semester. DSP can provide a letter specifying accommodations. If a student's approved accommodation is limited to extra time on examinations, accommodation will be provided. Students must make prior arrangements with the DSP office *2 weeks before* the first exam date. For more information visit: 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/>. 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/>.

Website

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

Laboratory Performance guidelines

You are required to be on time and attend all lab sessions. Any unexcused absences or early departures will seriously affect your evaluation. 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.

1. 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 work whenever requested. We will cover details on lab requirements and expectations for each specific lab.

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

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu