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) AHF 259
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 22	Lec 1 History of Oceanography Lab 1: Organismal diversity	KH	Ch 1	 Worksheet 1
Th Aug 24	Lec 2 Geology: Earth's structure, sediments, paleoceanography	NL	Ch 3	Assignment 1
T Aug 29	Lec 3 Water chemistry and properties of water Lab 2 Seawater density lab	NL	Ch 4	 Worksheet 2
Th Aug 31	Lec 4 General circulation in the oceans	NL	Ch 5	Assignment 2
T Sept 5	Lec 5 & Lab 3: ***Abalone Cove fieldtrip*** *(lecture and lab combined)*	KH		Worksheet 3 (Field data

				collection) Lab write-up
Th Sept 7	Lec 6 Tides and Waves	KH	Ch 6	
T Sept 12	Lec 7 Light and photosynthesis Lab 4 Pigment lab	NL	Ch 8	 Worksheet 4
Th Sept 14	Lec 8 Nutrient cycles and limiting factors	NL	Journal article	Assignment 3
T Sept 19	Lec 9 Primary production and primary producers Lab 5 Nutrient modeling/ Introduction to Stella	NL	Ch 8	 Worksheet 5
Th Sept 21	**MIDTERM I (Lectures 1-8)**	NL		
T Sep 26	Lec 10 Oceanic bacteria and archaea Lab 6 Stella ecosystem model	KH	Ch 8	 Worksheet 6
Th Sep 28	Lec 11 Linking biogeochemical cycles	NL	Journal article	Assignment 4
T Oct 3	Lec 12 Grazers and food webs **Presentation Topic Due** Lab 7 Microplastics (Samples from Abalone Cove)	KH	Ch 9	Assignment 5 Worksheet 7
Th Oct 5	*No class Makeup for WMSC field trip*			
T Oct 10	Lec 13 Shallow benthic environments *No lab Makeup for WMSC field trip*	KH	Journal article	**Abalone Lab write up due**
Th Oct 12	Lec 14 Lec 14 Select Marine Environments: Deep Benthic Environments: Hydrothermal vent systems/Hydrocarbon seeps.	NL	Ch 12	Assignment 6
T Oct 17	Lec 15 Ocean Acidification and its impacts Lab 8: Ocean acidification lab	NL	Journal article	 Worksheet 8
Th Oct 19	**MIDTERM II (Lectures 9-15)**	KH		
FR-Sun Oct 20 -22nd	WMSC FIELD TRIP	KH NL		Lab report
T Oct 24	Lec 16 Observing the oceans Lab 9: Zooplankton sample analysis	NL KH	Journal article	 Worksheet 9
Th Oct 26	Lec 17 Estuaries: physical structure; Watershed activity, biological structure	KH	Ch 15	
T Oct 31	Lec 18 El Niño Student presentations from WMSC field trip	NL	Journal article	Assignment 7
Th Nov 2	Lec 19 Modeling the ocean system	NL	Journal article	
T Nov 7	Lec 20 Marine Pollution/Marine Debris **Optional review of Final Presentation Outline** Lab 10: Boundary Flows; flume work	KH	Ch 15	 Worksheet 10
Th Nov 9	Lec 21 Case study: Fukashima as related to the oceans	KH	Journal article	
T Nov 14	Lec 22 & Lab 10: California Science Center – Guest Lecture Kelp Expert and marine food webs	KH		Worksheet 11
Th Nov 16	Lec 23 Marine Fisheries and Aquaculture and MPAs (larval dispersion and supply) – Guest lecture: Phyllis Griffman (USC Sea grant MPAs)	KH	Ch 11, 14	

T Nov 21	*No class Makeup for WMSC field trip* *No lab Makeup for WMSC field trip*			
Th Nov 23	**THANKSGIVING**			
T Nov 28	Student Presentations Student Presentations	KH NL		Final presentation and 2 pager
Th Nov30	Special Topics: Fukushima nuclear disaster and the marine environment: 6 years later	KH	TBA on Bboard	
T Dec 13th	**FINAL EXAM (Lectures 16-23) 11am -1pm**			

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.

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		**Labs and Assignments:**	
Midterms x 3 (200 pts each)		Diversity lab (Worksheet 1)	15
		Geology (Assignment 1)	10
		Seawater density lab (Worksheet 2)	15
		General Ocean Circulation (Assignment 2)	10
		Abalone Cove (Worksheet 3)	15
		Pigment lab (Worksheet 4)	15
		Nutrient cycles (Assignment 3)	10
		Nutrient modeling (Worksheet 5)	15
		Stella ecosystem modeling (Worksheet 6)	15
Abalone Cove lab report	40	Biogeochemical cycles (Assignment 4)	10
WMSC lab report	40	Presentation topic/references (Assignment 5)	5
WMSC student presentation	30	Micro-plastics (Worksheet 7)	15
Final student presentation	30	Oil Spills (Assignment 6)	10
		Ocean acidification (Worksheet 8)	15
		Zooplankton analysis (Worksheet 9)	15
		El Nino (Assignment 7)	10
		Boundary Flows (Worksheet 10)	15
		California Science Center (Worksheet 11)	15
Exam totals	**600**		
Class Assignments (x7) totals	**65**		
Lab Totals	**165**		
Lab reports and presentations	**140**		
Class participation	**30**		
CLASS TOTAL	**1000**		

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.

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

Assignments and Worksheets:

There will be 7 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 below table.

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, 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.

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) 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.

Reviews of primary literature
Additional readings for specific lectures or labs will be posted on Blackboard during the semester.

Research Presentation
Each student will choose an approved research topic, which they will develop a research presentation based on the primary literature. A detailed metric of instructions and expectations 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 marine biologists 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 are multiple field trips, including one weekend trip to Catalina Island.** Other labs fall within the normal lab time.

This class included two full lab write ups. Full lab reports should be formatted as in the example below. Pages should be numbered. Use 12 point font, double spaced. Lab reports 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 Blackboard (https://blackboard.usc.edu/).

General format
Title page (project title, date, course, your name)
Abstract (a one paragraph summary of the topics importance, what you did, what you found and a conclusion)
Introduction 2-3 pages (introduce topic, related literature, and your project)
Materials and Methods 2-3 pages (state what sampling methods were used and where you sampled)
Results and Discussion 2-3 pages (state what you found including data in tables; what it tells us about the project topic)
Literature Cited (list all references you mentioned) as needed using an accepted format found in a major journal for the topic.

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/).