Biology Department

Point Loma Nazarene University

BIO333: Marine Biology

3 units

"Here is the sea, great and wide, which teems with creatures innumerable, living things both small and great. There go the ships, and Leviathan, which you formed to play in it. These all look to you, to give them their food in due season."

– Psalm 104:25-27

Spring 2018

Meeting days: Lecture: Monday, Wednesday, & Friday Lab: Friday	**Instructor:** Dr. Walter W. Cho
Meeting times: Lecture: 1:30PM – 2:25PM Lab: 2:45PM – 6:15PM	**Phone:** x2398
Meeting location: Lecture: Taylor 313 Lab: Sator 105	**E-mail:** waltercho@pointloma.edu
Final Exam: Monday, 4/30/18, 1:30PM – 4:00PM	**Office hours:** Rohr Science 106 Tues. 1:30-3:30PM, Thurs. 10AM-12PM, or by appointment

PLNU Mission

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

COURSE DESCRIPTION

From the course catalog:

The study of life in the oceans, including the ecology, structure, function and adaptations of marine organisms to their environment. Lecture, lab and fieldwork.

Prerequisite(s): BIO 211.

Welcome to BIO333! In this course we are going to study one part of God's amazing creations, the oceans and the organisms within it. The ocean is a complex environment and we will start the course with a brief overview of the marine environment, examining the properties of seawater and the dynamic nature of the oceans including waves, tides, and currents. We will then discuss specific marine habitats and the organisms that live in them, focusing on the biological adaptations and ecological functions of marine organisms in their specific habitat. We will end with a discussion of human impacts on the marine environment. This course will involve a combination of lecture, labs/field trips, writing, and a discussion of published literature relevant to the field. Upon completion of this course, you will have a greater understanding of the ocean environment and its inhabitants, as well as a greater appreciation for the beauty and wonder of God's Creation around us.

COURSE LEARNING OUTCOMES

Upon completion of the course, you will be able to…

- … define and explain the fundamental marine habitats and marine organisms.
- … classify marine life based upon distinguishing characteristics and adaptations of multiple categories, including major taxonomic groups, major categories of aquatic life (plankton, nekton, benthos), and major biogeographic and habitat/depth patterns related to the physical characteristics of the ocean.
- … identify the major anatomical and physiological adaptations of marine organisms to the physical, chemical, and geological conditions of marine environments.
- … describe and interpret patterns of marine primary and secondary production, including energy flow in marine food webs, trophic structure, and the microbial loop.
- … describe the interactions of marine organisms through processes such as growth, reproduction, competition, predation, and varied symbioses and understand how these behaviors and processes are influenced by the physical environment.
- … describe the major marine community types, including their dominant habitat, community structure, and ecological characteristics.
- … discuss current and potential anthropogenic impacts upon marine ecosystems and demonstrate informed judgments about the effects of human activities on the marine environment.

COURSE CREDIT HOUR INFORMATION

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request.

REQUIRED TEXTS AND RECOMMENDED RESOURCES

Levinton, J. S. (2014) *Marine biology: function, biodiversity, ecology*. 4th Ed. Oxford University Press, New York: 576 pp.
Additional reading and articles as assigned for class discussions and posted on the course site.

ATTENDANCE AND PARTICIPATION

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member has the option of filing a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of W or WF consistent with university policy in the grading section of the catalog. See Academic Policies in the undergrad student catalog.

Class participation/attendance is a very important part of learning. Be responsible and show up for class.

Students are responsible for notifying the instructor of any known excused absence at least one week before the date of that absence. Three or more unexcused absences from class could result in a significant reduction of the student's final grade.

Make-ups for any missed assignments or activities will only be given if a legitimate excuse is given. The format of this make-up will be at the instructor's discretion.

Missed exams, with a documented excuse, must be made up within one week of the date on which they are given.

All students are expected to please turn off all telephones before entering class. No texting is allowed during class.

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due.
Regular assignments turned in late will be graded as follows: 5% reduction per day up to 3 days late; more than 3 days late = no credit.

ACADEMIC HONESTY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. As explained in the university catalog, academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. Violations of university academic honesty include cheating, plagiarism, falsification, aiding the academic dishonesty of others, or malicious misuse of university resources. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for a) that particular assignment or examination, and/or b) the course following the procedure in the university catalog. Students may appeal also using the procedure in the university catalog. See Academic Policies for further information.

ACADEMIC ACCOMMODATIONS

While all students are expected to meet the minimum academic standards for completion of this course as established by the instructor, students with disabilities may require academic accommodations. At Point Loma Nazarene University, students requesting academic accommodations must file documentation with the Disability Resource Center (DRC), located in the Bond Academic Center. Once the student files documentation, the Disability Resource Center will contact the student's instructors and provide written recommendations for reasonable and appropriate accommodations to meet the individual needs of the student. See Academic Policies in the undergrad student catalog.

FERPA POLICY

In compliance with federal law, neither PLNU student ID nor social security number should be used in publicly posted grades or returned sets of assignments without student written permission. This class will meet the federal requirements by distributing all grades and papers individually. Also in compliance with FERPA, you will be the only person given information about your progress in this class unless you have designated others to receive it in the "Information Release" section of the student portal. See Policy Statements in the undergrad student catalog.

FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination **on its scheduled day, Monday, April 30, 2018, 1:30PM – 4:00PM**. The final examination schedule is posted on the Class Schedules site. No requests for early examinations or alternative days will be approved.

USE OF TECHNOLOGY

Point Loma Nazarene University encourages the use of technology for learning, communication, and collaboration. Important materials including lecture, syllabus, course announcements, class and lab handouts, etc. will be posted on the **Canvas** website. The class site can be accessed at the web address above. It is your responsibility to check your email and the course Canvas website often.

ASSESSMENT AND GRADING

Grades will be based upon a straight percentage of the total possible points available in this course and will include the following requirements:

Approximate Grading Scale:

93-100 = A 90-92 = A- 88-89 = B+ 83-87 = B 80-82 = B- 78-79 = C+
73-77 = C 70-72 = C- 68-69 = D+ 63-67 = D 60-62 = D- 00-59 = F

Course Requirements:	**% Value of Final Grade:**
EXAMS:	
Exam #1	10%
Exam #2	10%
Exam #3	10%
Final Exam	20%
LAB/FIELD PARTICIPATION & REPORTS	25%
TERM PAPER	15%
ASSIGNMENTS/QUIZZES/ATTENDANCE/PARTICIPATION	10%
TOTAL	**100%**

Course Requirements in Detail:

A. Lecture:

The lectures will follow the tentative "TENTATIVE Schedule" attached to your syllabus. Due to limitation in time, lectures will cover important key concepts but will not cover all of the information important for this course. You will need to read the appropriate chapters before the lecture to be best prepared for lecture and to participate in classroom discussions. Keep up with the course material and do not be afraid to ask questions.

B. Exams:

There will be 3 exams (10% final grade each) and a Final Exam (20% of final grade). Each exam is objective and can consist of multiple-choice, matching, short answer and true/false type questions. There will also be some application questions including synthesis and analysis of important concepts as well as essay/discussion questions. Each exam will only cover material since the previous exam; however, fundamental concepts introduced early on will need to be remembered to address concepts throughout the course. The Final Exam will be comprehensive, covering topics from the 4th Unit of the course as well as the first 3 Units.

All materials in the class are potential test topics. This includes lecture materials from the required textbook (text, illustrations), lab information, any handouts or additional reading assignments you might receive, and in-class discussions on relevant topics or questions of interest.

TENTATIVE dates for the exams are: **Exam #1 – February 2, 2018 [F]; Exam #2 – March 16, 2018 [F]; Exam #3 – April 20, 2018 [F]; FINAL EXAM – April 30, 2018 [MON, 1:30PM–4:00PM]**. Except for the final exam, dates are subject to change depending on progression through required course material.
NOTE: See above for make-up policy for exams.

C. Lab/Field Participation & Assignments:

The field trips and labs have been designed to expose the students to as many possible different aspects and potential interests of marine biology. Because of the opportunity for exciting & significant scientific discovery and observation during these trips, attendance at scheduled lab activities and full completion of lab reports is mandatory and will constitute 25% of your grade. Absences must be excused ahead of time and unexcused absences for labs will count significantly against this portion of your final grade as lab makeup work will not be accepted when an excused absence is not given/recognized. A good portion of the "laboratory" component of this class will take place in the field where direct observations of phenomena can be made. Please see the tentative schedule for labs below.

NOTE: The weather may impact what we can do in the field. Flexibility and adaptability is an important part of marine research and something we all may experience this semester.

D. Term Paper:

You will be expected to write a term paper worth 15% of the final course grade. This will be in the form of a *review paper* where you will summarize and synthesize multiple peer-reviewed articles about a research topic of your choice focused on a particular marine organism or habitat.

Writing is a vital skill that you will use in whatever field you enter in the future. This is an opportunity to practice and improve that skill while learning about something that is important and interesting to you.

REQUIRED COMPONENTS:

1. You must decide upon your topic for the term paper and get instructor approval by **FRI, March 23, 2018**.
   - At the time you are seeking approval for the paper, you will submit a short summary of your paper topic (1 paragraph) and a list of at least 2 preliminary peer-reviewed sources, with justification of how the sources are relevant.
2. FINAL DRAFT OF YOUR TERM PAPER DUE: **FRI, April 13, 2018**.
   - Your term paper will be graded along the following criteria: your outline, prompt submission of required components, content and thoroughness of the topic discussed, proper grammar, exhibited knowledge of supporting literature. A grading rubric will be given to you before the final submission date.
   - The term paper should be 6-8 pages in length (not including references), double-spaced and with a 12 pt font.
   - You are expected to use/cite at least 4 references in the preparation of the paper and these must be listed in the bibliography following *Marine Ecology* Guidelines. All 4 references must be from peer-reviewed sources.
   - More information about the paper will be provided later in the semester.

E. Class Assignments/Quizzes/Attendance/Participation:

Class assignments and quizzes may be given throughout the course. These will focus on the reading and lecture materials. In addition, class attendance /participation is a very important part of learning and these will count for 10% of your final grade. Be responsible and show up for class.

You are responsible for notifying the instructor of any known excused absence at least one week before the date of that absence**.**

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BIO 333 Spring 2018 TENTATIVE Schedule (Underlining indicates reading)

Week	MONDAY Lecture	WEDNESDAY Lecture	FRIDAY Lecture	Lab
1/8	(Meet on Tuesday) Intro to BIO333 Text Chapter 1	Oceanic Environment 1 Text Chapter 2	Oceanic Environment 2	**No Lab** (0'@1:14PM)
1/15	**Martin Luther King Jr. Day - No class**	Oceanic Environment 3	Chemical & Physical Environment 1 Text Chapter 4	Intertidal Exploration 1 (-0.4'@4:48PM)
1/22	Chemical & Physical Environment 2	Life in Fluids Text Chapter 5	Reproduction, Dispersal, Migration 1 Text Chapter 6	Reynolds Number Lab
1/29	Reproduction, Dispersal, Migration 2	Reproduction, Dispersal, Migration 3	Plankton 1 Text Chapter 7	**EXAM #1** (-1.1'@4:46PM)
2/5	Plankton 2	Phytoplankton & Primary Productivity 1 Text Chapter 9, 10	Phytoplankton & Primary Productivity 2	Plankton Lab
2/12	Phytoplankton & Primary Productivity 3	Algae & Plants Text Chapter 11	Invertebrates 1 Text Chapter 12	Dissections (Molluscs) (-0.6'@3:46PM)
2/19	Invertebrates 2	Invertebrates 3	Invertebrates 4	Dissections (Echinoderms, Arthropods)
2/26	Invertebrates 5	Fishes 1 Text Chapter 8	Fishes 2 Text Chapter 8	Dissections (Fish) (-1.0'@3:37PM)
3/5	**Spring Break – No class**	**Spring Break – No class**	**Spring Break – No class**	**No Lab**
3/12	Reptiles & Birds 1 Text Chapter 8	Reptiles & Birds 2	Marine Mammals 1 Text Chapter 8	**EXAM #2** (-0.5'@3:44PM)
3/19	Marine Mammals 2	Marine Mammals 3	Marine Ecology 1 Term Paper Outline DUE Text Chapter 1, 3	Seaworld Trip
3/26	Marine Ecology 2 Text Chapter 3, 10	Marine Ecology 3 Text Chapter 1, 3	**Easter Recess – No Class**	**No Lab** (-0.6'@3:31PM)
4/2	**Easter Recess – No Class**	Benthic Habitats 1 Text Chapter 13	Benthic Habitats 2	Meiofauna Lab
4/9	Intertidal Habitats 1 Text Chapter 14	Intertidal Habitats 2	Subtidal Habitats 1 Term Paper DUE Text Chapter 15	Intertidal Lab (-0.1'@2:35PM)
4/16	Subtidal Habitats 2	Deep-sea Habitats 1 Text Chapter 16	Deep-sea Habitats 2	**EXAM #3**
4/23	Deep-sea Habitats 3	Biogeography 1 Text Chapter 17	Biogeography 2	Intertidal Exploration 2 (0'@2:23PM)
4/30	**FINAL EXAM (1:30PM-4:00PM)**			