

**California State University, Los Angeles**  
**Natural and Social Sciences/Biological Sciences**  
**BIOL 4570 Marine Invertebrate Zoology Spring 2017**

**INSTRUCTOR INFORMATION**

**Instructor:** Elizabeth Torres  
**Office Location:** ASCL 313  
**Telephone:** (323) 343-2179 (do not leave any messages)  
**Email:** etorre11@calstatela.edu  
**Office Hours:** Monday 11:00 am -12:00 pm in ASCL 344  
**Class Day/Time:** MW 1:40-2:55 pm [4 units]  
**Classroom:** lecture – BIOS 246; lab – ASCL 344  
**Prerequisites:** Grade of C or higher in BIOL 1200, Biol 100A, or equivalent.

**LAB SCHEDULE**

Section	Lab	Instructor	Email
<b>02</b>	<i>Wed 11:00 am-1:30 pm</i>	<i>Dr. Torres</i>	etorre11@calstatela.edu
<b>03</b>	<i>Wed 3:00-5:30 pm</i>	<i>Maura Palacios Mejia</i>	mpalac30@calstatela.edu

**COURSE DESCRIPTION**

Taxonomy, phylogeny, and natural history of major marine invertebrates taxa; laboratory work emphasizes species from local fauna and those of economic importance.

**COURSE OUTCOMES**

Upon successful completion of this course, students will be able to:

- Identify specimens to Phylum (and to other taxonomic levels depending on taxon)
- For each major invertebrate phylum, know the major evolutionary innovations of the body plan that led to that phylum's initial or persistent success in marine environments.
- Know synapomorphies that unite members of each phylum or well-established clade.
- Explain the role of developmental gene networks in metazoan evolution.
- For each phylum or class, identify the larval form that corresponds to a given adult.
- Identify and describe conflicts between recent molecular and traditional morphological approaches, including where their respective trees agree and disagree. Recognize taxonomic problems caused by homoplasy.
- Examine macroscopic and microscopic details and use taxonomic keys or other resources to identify unknown local specimens.
- Produce drawings of representative specimens, and record personal observations of live animal behavior in a scientific manner.
- Know the structures and functions associated with invertebrate support and locomotion, feeding and digestion, circulation and gas exchange, nervous systems and sensory organs, and reproduction and development.

## COURSE OUTLINE/SCHEDULE

<b>Week</b>	<b>Lecture Topic</b>	<b>Reading Assignment</b>	<b>Lab Activity</b>
<b>Week 1</b> 1/23, 1/25	<i>Phylogeny, Marine Environments</i> <i>Animal Body Plans</i>	Ch. 1, 2 Ch. 4	Enrollment – Introduction to lab
<b>Week 2</b> 1/30, 2/1	<i>Development, Life History</i> <i>Porifera</i>	Ch. 5 Ch. 6	Overview of phyla; drawing techniques
<b>Week 3</b> 2/6, 2/8	<i>Cnidaria 1</i> <i>No lecture Wed- FIELD TRIP</i>	Ch. 7	FIELD TRIP – Cabrillo Aquarium San Pedro, CA
<b>Week 4</b> 2/13, 2/15	<i>Cnidaria 2</i> <i>Cnidaria 3/Ctenophora</i>	Ch. 7 Ch. 8	Porifera/Cnidaria
<b>Week 5</b> 2/20, 2/22	<i>Triploblasts: Platyhelminthes</i> <i>Mollusca 1</i>	Ch. 9, 10 Ch. 13	Molluscs
<b>Week 6</b> 2/27, 3/1	<b>Midterm 1</b> <i>Mollusca 2</i>	[Ch. 1-2, 4-10] Ch. 13	Annelids
<b>Week 7</b> 3/6, 3/8	<i>Mollusca 3</i> <i>Annelids 1</i>	Ch. 13 Ch. 14	Live specimens: Molluscs + Annelids
<b>Week 8</b> 3/13, 3/15	<i>Annelids 2</i> <i>Annelids 3</i>	Ch. 14 Ch. 14	Lab Practical Exam I
<b>Week 9</b> 3/20, 3/22	<i>Lophophorates</i> <i>Nematodes/Arthropods I</i>	Ch. 17 Ch. 18, 20	Arthropods
<b>Week 10</b> 3/27, 3/29	<b>Spring Break</b> <i>Arthropods II</i> <i>Arthropods III</i>	<b>Spring Break</b> Ch. 21 Ch. 21, 22	<b>Spring Break</b>
<b>Week 11</b> 4/3, 4/5	<i>Echinoderms 1</i> <b>Midterm 2</b>	Ch. 25 [Ch.13, 14, 17, 18, 21, 22]	Echinoderms
<b>Week 12</b> 4/10, 4/12	<i>Echinoderms 2</i> <i>Field Trip California Science Center</i>	Ch. 25	FIELD TRIP: California Science Center/NHM
<b>Week 13</b> 4/17, 4/19	<i>Echinoderms 3</i> <i>Invertebrate Chordates</i>	Ch. 25 Ch. 27	Live specimens: Arthropods + Echinoderms + lophophorates
<b>Week 14</b> 4/24, 4/26	<i>Group Project</i> <i>Group Project</i>		Lab Review
<b>Week 15</b> 5/1, 5/3	<i>Group Project</i> <i>Review</i>		Lab Practical Exam II
<b>Week 16</b> 5/15,	<i>Mon = Finals Study Day</i> <i>Tues-Fri, Final Exams</i>	All chapters	No Lab
<b>Final Exam</b>	Wed <b>May 17</b> at 1:40pm (to be confirmed)	Cumulative Final Exam	No lab

### COURSE STRUCTURE

This course is conducted with two in-person lectures per week and one laboratory. There are two field trips that will take the place of a full day of lecture/lab. The field trips are highly recommended.

## REQUIRED COURSE MATERIALS

### TEXTBOOK:

**Title:** Invertebrates

**Authors:** Richard Brusca, Wendy Moore & Stephen Shuster

**Edition:** 3rd

**ISBN:** 978-1605353753

### OTHER READINGS

Links to websites with information that is at appropriate level for this course will be provided on Moodle. It is recommended that students view all video links posted to Moodle.

### MATERIAL REQUIREMENTS

You will need to maintain a **lab notebook** – a composition book style with at least half of the page unlined for drawings; observations can be made on lined part of the page or unlined. You will also need pencils, a pencil sharpener, a small ruler, and a good eraser. Colored pencils are optional. On a few occasions, we will do dissections of specimens from food markets, so you may want to bring a **lab coat**. Some examples include squid, octopus, shrimp, and clams.

### COURSE POLICIES

There are NO MAKE-UPS if you miss activities without written medical excuse. Make up exams will only be considered with an official notice from a doctor in the case of illness. The syllabus, lectures, course announcements and resources will be posted on the class website (Moodle). Student grades will be posted and maintained in Moodle. All students that are registered for the course are automatically enrolled in the Moodle course. You can access Moodle through mycsula on University homepage or moodle.calstatela.edu. Students are expected to be present for their in-person lab; drawings and assignments on days that you are not present will not be accepted for credit. You must be present in lecture to earn credit for lecture activities.

### ASSIGNMENTS AND GRADING POLICY

**Lab** meets on Wednesdays. The **activities** will consist of drawings (live and preserved specimens), worksheets, observations of live and preserved specimens. You are encouraged to bring your textbook, laptop, tablet or smartphone to assist in looking up information. The schedule will closely follow the taxonomic categories that are covered in lecture. You will make drawings, note observations, report magnification/size scale, and classify each organism. You must make original drawings from observations of specimens, not from other student drawings, photographs, books, or online information. It is considered academic dishonesty if you copy other people's drawings. Sketches must be one-half page per drawing. Important features should be labeled. There will be **two laboratory practical exams** where students will be timed at each station and will answer questions about specimens (identification, structure, function).

The **midterms** and **final exam** will have a similar format, and will include some "objective" questions (multiple choice, matching, label diagrams, fill in the blank.), short answers (1-2 sentences), and short essay questions (1-2 paragraphs). Exam questions will be based on material covered in lectures, laboratory, and course readings. **The final exam is cumulative.**

Students will work on a **group project** in class. Groups will be formed based on interest in a particular topic or field. **Extra credit will not be available.**

## GRADING CRITERIA:

### POINTS POSSIBLE

Assignment	Percentage
2 Midterms [100 pts each]	~33.3%
Final Exam [150 pts - cumulative]	25%
Lecture Activities [75 pts]	12.5%
Group Project [25 pts]	~4.2%
Laboratory Notebook [100 pts]	~16.7%
2 Practical Exams [25 pts each]	~8.3%
<b>Total: 600 pts</b>	<b>100%</b>

## GRADING SCALE:

A=94% or above, A- =90-93.9%, B+ = 86-89.9%, B=83-85.9%, B- =80-82.9%, C+ 76-79.9=%, C=70-75.9%, C- =67-69.9%, D+ =64-66.9%, D=60-63.9%, D- =55-59.9%, and F= below 55%.

## GRADES

You can view your grades using the *GRADES* button in the course navigation links in Moodle. Please check your grades **regularly** to make certain that we have received all your assignments. If you have a question about a lab grade, email your laboratory instructor. Questions about graded activities in lecture will be addressed by Dr. Torres.

## HELPFUL STUDENT RESOURCES

**TECHNICAL RESOURCES:** <http://www.calstatela.edu/cetl/technical-support-resources>

**STUDENT SUPPORT SERVICES:** <http://www.calstatela.edu/cetl/student-support-resources>

**ACADEMIC SUPPORT SERVICES:** <http://www.calstatela.edu/cetl/academic-support-resources>

**MOODLE MENTOR SITE:** Information for students on how to be a successful online student and how to use Moodle <http://www.calstatela.edu/moodlemmentor>

## **COURSE & UNIVERSITY POLICIES:**

**STUDENT HANDBOOK:** Information on student rights and responsibilities, academic honesty, standards of conduct, etc., can be found in Schedule of Classes for the current quarter (<http://www.calstatela.edu/classschedule/>) under Policies and Procedures.

**DROPPING AND ADDING:** Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes: <https://get.calstatela.edu/Registrar.htm>.

**INCOMPLETE GRADE POLICY:** Incomplete grades can only be assigned when the majority of the coursework has been completed (essentially all work except the final exam), and the student is passing the course. The submission of an Incomplete Grade Form is required.

**AMERICANS WITH DISABILITIES ACT (ADA):** Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the website at <http://web.calstatela.edu/univ/osd/atlc.php>.

## **ACADEMIC HONESTY/STUDENT CONDUCT**

**Academic Honesty:** Many incidents of plagiarism result from students' lack of understanding about what constitutes plagiarism. However, you are expected to familiarize yourself with Cal State L.A.'s policy on plagiarism. All work you submit must be your own scholarly and creative efforts. Cal State L.A. plagiarism as follows: "At Cal State L. A., plagiarism is defined as the act of using ideas, words, or work of another person or persons as if they were one's own, without giving proper credit to the original sources."

**Student Conduct:** [http://ecatalog.calstatela.edu/content.php?catoid=11&navoid=772#stud\\_cond](http://ecatalog.calstatela.edu/content.php?catoid=11&navoid=772#stud_cond)

**Turnitin Statement:** In this course we will utilize turnitin.com, an automated system that instructors can use to quickly and easily compare each student's assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you will be expected to submit assignments in an electronic format. After the assignment is processed, as instructors we receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process, visit Turnitin <http://www.calstatela.edu/cetl/edtech/student-faq>

Invertebrates are animals that belong to a large animal group. These animals do not belong to a single sub-phylum like the vertebrates. They are the animals without a backbone. This was all about the vertebrate and invertebrate differences. There are hundreds of different animals in earth. These animals are grouped together based on their similarities and further divided according to their differences. Invertebrate is a term used to describe any animal without a backbone or spinal column. The group includes about 97 percent of all animal species; that is, all animals except vertebrates, (subphylum Vertebrata of the phylum Chordata), which have a backbone or spinal column. Invertebrates include simple organisms, such as sponges and flatworms, and more complex animals, such as arthropods and molluscs. Vertebrates include the familiar fish, reptiles, amphibians, birds, and mammals. Since invertebrates Invertebrate, any animal that lacks a vertebral column, or backbone, in contrast to the cartilaginous or bony vertebrates. Apart from the absence of a vertebral column, invertebrates have little in common. More than 90 percent of all living animal species are invertebrates. Apart from the absence of a vertebral column, invertebrates have little in common. Indeed, they are distributed between more than 35 phyla. In contrast, all vertebrates are contained within a single phylum, the Chordata.