



**BIOL 1150 Lab**  
**General Biology II Laboratory**  
**“The Diversity of Life”**  
**CSU Stanislaus, Spring 2019**



### **I. General Information**

**Section:** 1150-009

**Time:** Thursday 6:00 p.m. - 8:50 p.m.

**Location:** N206

**Instructor:** Dr. Patrick Kelly, Professor of Zoology and Coordinator, Endangered Species Recovery Program, Department of Biological Sciences

**Office Hours:** Thursday and Friday 8:00-10:00, room N277 (or by appt.)

**Email:** [pkelly@csustan.edu](mailto:pkelly@csustan.edu)

Email is the best way to reach me. I usually respond quickly to simple requests and questions, but please write “BIOL 1150” in the subject line, and include your full name in the email.

**Office Phone:** (209) 667-3446

### **II. Course Description**

Introduction to the fundamental aspects of **organismal biology**: taxonomy, evolution, diversity, form and function, and ecology.

BIOL 1150 is the second semester of the two-semester general biology sequence at CSU Stanislaus. The lecture and laboratory portions of the course must be taken at the same time. It is not possible to take the lab or lecture separately, even if you have passed one or the other a previous semester. This course is designed specifically for biology majors, as well as other students who need a comprehensive introduction to biology. All students enrolled in BIOL 1150 must have received a C- or better in 1050; students without a C- or better grade will be dropped from the class. To receive credit for the one-year biology sequence, you must take *both* Biology 1050 and Biology 1150 at CSU Stanislaus, or transfer the complete, equivalent one-year *majors* series from another institution.

The General Biology II laboratory is designed to provide students with laboratory and field experience with a focus on the **diversity of life**. We will explore many of the topics that are covered in lecture, but in lab we have the luxury of carrying out laboratory and field exercises that give you practice being a scientist. A major goal of this course is for you to develop an appreciation of the diversity of life, how this diversity came about (evolution), and how biota interact with their environment (ecology). Additionally, this lab will give you the tools to recognize, classify, and describe virtually all of the world’s life, and to carry out independent investigations of organismal biology.

*“The beginning of wisdom is calling things by their right names.”* (Chinese Proverb)

### **III. Student Learning Objectives**

After completing this course, you should be able to:

1. Recognize, identify, and classify the major groups of life on earth, and understand how they are related to one another on the tree of life (phylogeny).

2. Describe the basic biology (life cycles, internal and external features, ecology, and evolutionary history) of the major groups of life on earth.
3. Describe how technological advances, including microscopes and genetic sequencing, have expanded our understanding of the diversity of life on earth.
4. Proficiently use compound and dissection microscopes to examine cells, tissues, and organisms.
5. Create cladograms that describe hypothetical evolutionary relationships based on morphological or genetic characters of specimens.
6. Analyze and interpret biological data collected in the field and laboratory using statistics and graphs.
7. Cooperate with other students to investigate and learn about the diversity of life, ecology, and evolution.

#### IV. Grades

Grades will be based on quizzes, exams, in-class activities, a biodiversity survey assignment, and a Monterey Bay Aquarium assignment. Your lab grade is worth 25% of your total grade for the course, but points from lab may not be 1:1 equivalent to points for the lecture portion of the course; nevertheless, your lab grade will still be worth 25% of the total. Your lab score will be submitted to your lecture instructor, who will combine your lab score to your lecture score and assign your final grade for the class.

Quizzes/Lab Activities (11x10 pts, drop the lowest)	100 pts.
Ecology field project	35 pts.
Biosurvey	35 pts.
Monterey Bay Aquarium Assignment	30 pts.
Lab Exam 1	50 pts.
Lab Exam 2	50 pts.
<b>TOTAL</b>	<b>300 pts.</b>

#### In-Class Quizzes and Participation

Typically, I will give a 10-point quiz at the start of lab covering material from the previous lab and/or general concepts we will be working on that day in lab. You must be present at the time of the quiz in order to take it; there are no make-ups. Students who show up late will not be allowed to take quizzes. To do well on quizzes, make sure you are staying on task, completing all of the activities, and closely examining the specimens. Questions will come from material in the lab workbook, **which you need to read ahead of time to be prepared for class**. Most of our class time will be spent applying the material that is in the lab manual, rather than going over the basic concepts (which you should read and study ahead of time). Pay particular attention to the “objectives” listed at the beginning of each exercise.

At various times during lab, I may randomly choose one or more groups to present their answers to questions from the day’s lab assignment. You and your group members need to give a thorough explanation that answers the question. A simple, off-the-top-of-your-head answer will not suffice. Often, the questions will come from questions at the end of each lab exercise. Lab questions often require thinking critically about the topic and making educated guesses. The answers will not always be obvious, and there may not be a “right answer.” Your answers will be judged on completeness, originality, and level of critical thinking.

Additionally, I may assign homework in the form of questions or analyses. Homework will be due at the beginning of class, and will be a part of your daily 10 points for quizzes/lab activities.

Please be courteous about taking breaks during class. Class usually begins with a quiz and a short introductory lecture, which may last for up to one hour. Please try to avoid leaving the room during this time. Once you are working independently or in groups there will be opportunities to use the restroom, get a drink of water, or stretch your legs.

## Lab Exams

Two lab practical exams will cover lab material, including examples of the various organisms we examine in lab. There will be two types of questions: (1) questions that ask you to identify organisms and give their scientific and/or common names, and (2) short-answer questions about the organisms' ecology, morphology, and evolutionary history. The exams are not cumulative.

## Biosurvey

The biosurvey is a project to observe, identify, and photograph different forms of life. You will be required to find, identify, and take photographs of a wide diversity of organisms. You will submit your photos, along with information on where and when you observed the organism, for credit. The Biosurvey is due by Lab 11 (**Apr 15-19**), but can be turned in earlier if completed.

## Ecology Project

Students, working in pairs, will conduct original ecological research, due Lab 14 (**May 6-10**).

## Field Trip to Monterey Bay Aquarium

On Saturday, April 20, from 7:45 a.m. to 6 p.m., we will travel by bus—paid for from your lab fees—to the Monterey Bay Aquarium, arguably the finest marine aquarium in the world, where you will complete a stimulating assignment on marine biodiversity.

## **V. Required Course Materials**

- 1. Exploring Biology in the Laboratory, CSU Stanislaus edition.** Authored by Pendarvis and Crawley, published by Morton. Available from the campus bookstore. Bring it with you to each lab. You will need it to follow along with the lab exercises and to answer study questions. It is also handy for making notes and drawings during lab. Each student will need her/his own manual.
- 2. Dissection Kit.** Available at the campus bookstore or at Nasco Lab Supply (4825 Stoddard Rd., Modesto). It should have a scalpel, forceps, a blunt probe, and micro-dissection scissors. A good kit costs \$10-15 and can be shared by a pair of students.
- 3. Campbell's Biology.** Your lecture textbook will be very helpful as you work on lab assignments and questions. It is recommended that you bring the relevant chapters to lab.

## **VI. Laboratory Policies**

This course requires your presence in lab every week for the **entire lab period**. Because the laboratory setups change from class to class, it is **not possible to make-up missed laboratories**. Unexcused absences will result in no points for quizzes and any other graded activities given that day. If you know you will miss a lab ahead of time, tell your lab instructor at least one week in advance; with instructor permission you *may* be able to attend a different lab section.

I have a no-tolerance policy for cheating and plagiarism. Students cheating on quizzes or exams or representing the work of others as their own will receive a zero for that assignment and will receive an F in the class. Even a quick glance at your neighbor's paper during a quiz is considered cheating, and subject to disciplinary action. As a student at CSU Stanislaus, you should take great satisfaction and pride in knowing that the work you submit is completely your own.

You need to make productive use of lab time in order to make sure you finish all of the assignments and examine all of the specimens. **You should expect to spend the entire 2 hour and 50 minute class period working in lab each week.** If you finish your lab assignment early, you should take advantage of the extra time to study the topics covered that day. Identifying specimens requires developing keen observation skills, and an ability to recognize similarities amidst differences. These skills are only developed through practice. Understanding and remembering the material we cover is a challenge for most students.

## BIOL 1150 Laboratory Schedule

Lab #	Week of	Lab Activities, (Chapter # in manual)	Points (quizzes, activities)
1	Aug 26 - 30	(Handout) Deep Time, Study Skills	
2	Sep 3 - 6	(15) Evolution handout, (Handout) Cladograms, (16) Biological classification, Start 18.3, How to do science	10
3	Sep 9 -13	Microscope review, (18) Bacteria	10
4	Sep 16 - 20	(19) Protists, Introduction to Ecology for project	10
5	Sep 23 - 27	(20, 21) Seedless Plants	10; First 10 Biosurvey observations-10
6	Sep 30 – Oct 4	(22, 23, 24) Seed Plants	10
7	Oct 7 - 11	(25) Fungi/Lichen, (26) Animal Tissues	10
	Oct 14 - 18	<b>No labs – Spring break</b>	
8	Oct 21 – 25	<b>Lab exam 1</b>	50
9	Oct 28 – Nov 1	(27, 28 ) Inverts I	10
10	Nov 4 - 8	(29) Inverts II	10
11	Nov 11 – 15	(30) Deuterostomes	10; Biosurvey due – 25
12	Nov 16	MBA Field Trip	10
	Nov 25 – 27	THANKSGIVING	30 – due on day of trip
13	Dec 2- 6	(Handout) Mammal dentition, (30.4) Frog dissection	10
14	Dec 9/10 & 12/13	<b>Lab exam 2</b>	50; Ecology Project due – 35
		(Finals start on 12/12)	

*“To keep every cog and wheel is the first precaution of intelligent tinkering.”*

Aldo Leopold, A Sand County Almanac

*“Mankind has gone very far into an artificial world of his own creation. He has sought to insulate himself, in his cities of steel and concrete, from the realities of earth and water and the growing seed. Intoxicated with a sense of his own power, he seems to be going farther and farther into more experiments for the destruction of himself and his world. There is certainly no single remedy for this condition and I am offering no panacea. But it seems reasonable to believe — and I do believe — that the more clearly we can focus our attention on the wonders and realities of the universe about us the less taste we shall have for the destruction of our race. Wonder and humility are wholesome emotions, and they do not exist side by side with a lust for destruction.*

-Rachel Carson, speech accepting the John Burroughs Medal (April 1952)