



**BIOL 1150 Lab**  
**General Biology II Laboratory**  
**“The Diversity of Life”**  
**CSU Stanislaus, Spring 2015**



**I. General Information**

**Section:** 1150-004

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

**Location:** N206

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

**Office Hours:** 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 to simple requests and questions within 24 hours. Important: Please write “BIOL 1150” in the subject line, and include your full name in the email.

**Office Phone:** (209) 667-2246 (I do not check messages every day)

**Personal Website:** <http://esrp.csustan.edu/>

**Course Website:** Blackboard (<http://www.csustan.edu/blackboard>)

**II. Course Description**

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

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 looking closely at examples of all of the major groups of living organisms on earth, as well as 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 this diversity, and give you the tools to recognize, classify, and describe virtually all of the world’s life.

*“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 (i.e., recalling the scientific names of taxonomic groups at the Kingdom, Phylum, and/or Class level).
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 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.

#### IV. Grades

Grades will be based on exams, an ecology project, a biodiversity survey assignment, a Monterey Bay Aquarium assignment, quizzes and other lab activities. Your lab grade is worth ~1/3 of your total grade for the course. Note: 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 33% of the total.

Quizzes/Lab Activities	100 pts.
Ecology Project	35 pts.
Campus 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

There will be 100 points allocated to quizzes and other lab activities. Not every lab will have a quiz, and if quizzes totaling more than 100 points are given, the lowest one(s) can be dropped. Typically, I will give a 10-pt. quiz at the start of lab covering material from the previous lab and 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.

Please be courteous about taking breaks during class. Class usually begins with a quiz and a short introductory lecture. 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 (100 pts)

Lab practical exams (2) will cover “the diversity of life,” 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.

### Ecology Project (35 pts)

The last 4 labs (11-14) are dedicated to ecology. For part of that time, you will carry out a research project related to ecology and biodiversity. Working in a group, you will develop a hypothesis, conduct an experiment, analyze data, and write up a report. The report will be submitted and presented (using PowerPoint, Keynote, etc.) during finals week (May 18-21).

### Campus Biosurvey (35 pts)

The campus biosurvey is a project to identify 35 different forms of life that occur on the CSU Stanislaus campus. 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 will be due in class during Week 14, May 11-14.

### Field Trip to Monterey Bay Aquarium & Moss Landing Marine Lab (30 pts)

On Saturday, April 18, 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. On our return trip to campus, we will visit ‘our’ marine lab, the famous Moss Landing Landing Lab. This is going to be a fun and educational way to spend a Saturday.

## **V. Required Course Materials**

- 1. BIOL 1150 Lab Manual.** 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. Because the lab instructors wrote this manual from scratch, it is relatively inexpensive (<\$20). Each student will need her/his own manual.
- 2. Photographic Atlas for Biology Lab.** By Van De Graaff and Crawley, 7<sup>th</sup> Edition, Morton Publishing Company. Available from the campus bookstore (~\$30-\$40 new). This book is extremely helpful when we are looking at specimens and performing dissections in class. Virtually every specimen and slide we examine in class is shown and labeled in this photo atlas. It will be your best guide as we examine the diversity of life. You can buy it new or used in the campus bookstore, or online, in bound, soft-cover format, or as loose-leaf, 3-hole punched pages. We recommend the loose pages so they can lay flat in your binder while you do dissections or examine specimens.
- 3. Dissection Kit.** Available at the 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.
- 4. Campbell's Biology.** Your lecture textbook will be very helpful as you work on lab assignments and questions. It is recommended, although not required, that you bring it 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 for Spring 2015

#	Week	Topics (numbered items refer to exercises in the lab manual)
1	2/2-5	Introduction, Syllabus, (1) History of Life/Living History
2	2/9-12	(2) Classification, (3) Microbes I, (9) Cladograms
3	2/16-19	(4) Microscopes, (5) Bacteria Cells, (6) Microbes II,
4	2/23-26	(7) Protists, Pond Sampling, (10) Intro to Plants
5	3/2-5	(11) Bryophytes, (12) Pteridophytes, (13) Gymnosperms
6	3/9-12	(14) Angiosperms, (15) Supermarket Botany
7	3/16-19	<b>Exam 1.</b> Afterwards: (9) Fungi/Lichen, (16) Animal Tissues
8	3/23-26	Invertebrate Biodiversity (17-24)
9	3/30-4/3	(25) Chordata, (26) Frog dissection
		<i>(n.b., Tuesday 3/31 is a holiday—Cesar Chavez Day)</i>
	4/6-10	<i>Spring Break</i>
10	4/13-16	(25) Chordata (cont.), (27) Animal Adaptations
	Sat. 4/18	Monterey Bay Aquarium Field Trip (7:45 am – 5:45 pm)
11	4/20-23	<b>Exam 2.</b> Afterwards: (28) Ecology, Insect Biodiversity Experiment
12	4/27-30	Field Ecology: Study Design and Data Collection
13	5/4-7	Field Ecology: Data Collection, Analysis and Writing
14	5/11-14	Field Ecology: Data Analysis and Writing; Landscape Ecology
	5/18-21	<b>Ecology Project</b> (submission and presentations)

*“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)