

BIOLOGY 242L: GENOMES AND EVOLUTION LABORATORY

Fall 2017

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Office Hours: MWF 11:00 am - noon
MF 1:00 - 2:00 pm
by appointment

Text: Urry, L.A. (and others). 2017. Campbell's Biology, 11th ed. Benjamin Cummings Publishing Company, San Francisco.
Knisely, K. 2017. Writing in Biology, 5th ed. Sinauer/Macmillan, Sunderland, MA.

Course website: <https://ole.sandiego.edu/>

Syllabus

This is the laboratory part of Biology 242. You must be enrolled in the lecture part of this course if you are in this lab. The laboratory provides you with a direct hands on approach to our inquiry into the genetic basis of evolutionary change and testing of hypotheses of adaptation. You will come to understand the relationships of structure and function. In addition, you will learn to approach evolutionary biology through “tree-thinking”.

Labs will meet on Wednesday afternoons from 2:30 to 6:30 pm. As the days grow shorter over the course of the fall semester, you may feel that the labs are getting longer. They aren't. Do not be tempted to leave lab early. Most labs are designed to last four hours. Typically, material will be put on Blackboard for the coming lab. Any other material you may need will also be posted on Blackboard. So will announcements, including adjustments to the syllabus or discussions about certain topics. But basic communications between members of the class and me will be through e-mail. Blackboard will not be used for posting grades.

Please turn off your cell phones before lecture begins. If you have a laptop computer, you are encouraged to bring it to class. If you do not have a laptop, we will endeavor to provide you with one during labs. However, in that case, do not forget to e-mail all your work to yourself because our laptops will not save it. The Academic Integrity policy of the University will be in force at all times. So although some assignments will be for groups, those assignments given to individuals that show signs of collaboration with other students will be penalized.

Learning Outcomes for Biology 242L

At the end of the semester a student who has taken both Biology 242 and 242L should be able to:

1. *Design and conduct an experimental and/or observational investigation to generate scientific knowledge.*
2. *Analyze data using methods appropriate to Biology in order to make valid and reliable interpretations.*
3. *Describe how information flows through cells, organisms, and entire populations; and how it contributes to the evolution of diverse organisms.*
4. *Identify and use appropriate and sufficient scientific evidence to evaluate claims and explanations about the natural world.*

Grading

- 50 points: Formal laboratory write-up
- 50 points: Group project and oral presentation
- 10 points: Laboratory assignment: creating and presenting figures
- 20 points: Laboratory assignment: understanding phylogenies
- 20 points: Laboratory exam #1
- 50 points: Final laboratory exam
- 0-25 points: Assignments, pop quizzes, etc. at professor's discretion

Final grades are determined by total points accumulated from the above material based on the following breakdown (this course is not scaled or curved):

A	93% - 100%	C+	77% - <80%	F	<60%
A-	90% - <93%	C	73% - <77%		
B+	87% - <90%	C-	70% - <73%		
B	83% - <87%	D+	67% - <70%		
B-	80% - <83%	D	60% - <67%		

BIOLOGY 242 LABORATORY SCHEDULE

<u>Week</u>	<u>Date</u>	<u>Laboratory Goals</u>
1	Sept. 13	Scientific Method Phylogenetic Relationships of Bacteria, Archaea, & Eukarya Introduction to Microscopy Bacterial Traits and Antibiotic Resistance
2	Sept. 20	Formulation of Hypotheses re Antibiotic Resistance Aseptic Technique Introduction to Spreadsheets and Standard Curves
3	Sept. 27	Start Experiment to Determine if Antibiotic Resistance is Spontaneous or Induced Introduction to Figure Formatting
4	Oct. 4	Data Collection; Introduction to Statistics Experimental Results/Discussion Formulate Hypotheses for Group Experiments
5	Oct. 11	Start Group Experiments to Investigate Antibiotic-resistant Mutants
---	Oct. 18	NO FORMAL LAB THIS WEEK – But... Group Experiments' Data Collection/Analysis Introduction to Lab Reports
6	Oct. 25	Introduction to <i>Mesquite</i> Build Morphological Phylogeny of Terrestrial/Aquatic Molluscs
7	Nov. 1	Invertebrate Adaptations to Land: I. Field Work Work on Group Projects
8	Nov. 8	Invertebrate Adaptations to Land: II. Comparative Lab Work Work on Group Projects
9	Nov. 15	Formulation and Testing of Hypotheses re Plant Adaptations to Land Work on Group Projects LAB PRACTICAL
—	Nov. 22	NO LAB THIS WEEK: <i>Happy Thanksgiving!</i>
10	Nov. 29	Adaptive Reproductive Strategies of Plants Work on Group Projects
11	Dec. 6	Vertebrate Adaptations to Land (Muscle & Skeleton) Oral Presentations of Group Projects
12	Dec. 13	Vertebrate Adaptations to Land (Circulation) Oral Presentations of Group Projects
—	Dec. 18	LAB FINAL