



**BIOL 1150-001**  
**General Biology II**  
**“Evolution, Diversity, and Ecology”**  
**CSU Stanislaus, Spring 2015**



### **I. General Information**

**Time:** MWF 8:00-8:50 am

**Location:** N101

**Instructor:** Dr. Matthew R. Cover, Associate Professor, Department of Biological Sciences

**Office Hours:** Monday 9:00-10:30 and Wednesday 9:00 – 10:30; in my office (room N273)

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

The best way to communicate with me is to come to my office hours. The second best way is email; I usually respond to simple questions within 48 hours. Important: Please write “BIOL1150” in the subject line, and include your full name and student ID in the email; otherwise I might miss your email. Also, note that very complicated questions are best answered in person- I may reply to your email and ask you to speak with me in person.

**Personal Website:** <http://www.matthewrcover.com> (learn a bit about my research)

**Twitter:** <https://twitter.com/matthewrcover> (biology, environmental science, climate, and teaching)

**About the instructor:** I have spent my whole life in Northern California. I went to U.C. Berkeley and decided to major in Earth Science, probably because I enjoyed running and biking up and down hills and was fascinated by mountain landscapes. I worked for several years at a state government agency doing water quality monitoring in streams and rivers, which got me interested in aquatic biology. I decided that to advance in my career I needed to learn biology, so I went back to grad school and got my PhD in Environmental Science. Along the way I realized I really enjoyed teaching, so after finishing grad school I was lucky to get a job teaching biology here at CSU Stanislaus in 2008. For fun I enjoy spending time with my family and friends (especially when there is food and drink involved), listening to music, and walking my dog. Luckily one of my favorite activities is also part of my job: I really enjoy exploring river and stream ecosystems and studying the species that live there.

### **II. Course Description**

Introduction to the fundamental aspects of **organismal biology: evolution, diversity, 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. If you are enrolled in this lecture section, you need to be enrolled in one of these lab sections:

- BIOL 1150-002, Monday 9-12 (Sue Ellen Gleaves)
- BIOL 1150-003, Tuesday 9-12 (Jeremy Shuman)
- BIOL 1150-004, Thursday 6-9 (Dr. Patrick Kelly)

Enrollment changes (i.e., adding the course) will be done by the lab instructor. In other words, if you can add a lab section then you will be enrolled in the lecture section as well. There are no labs the first week of classes; labs begin on February 2. Make sure you attend the first lab section or you will be dropped!

This course is designed specifically for biology majors, as well as other students who want 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 dis-enrolled. 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 course is designed to provide students with knowledge about organismal biology. We divide the lecture and lab course into three main components:

1. Evolution: by what processes do lineages change in their genotype and phenotype over time?
2. Diversity: what are the major groups of life on earth? How do we classify and describe these groups?
3. Ecology: how do species interact with each other and with the environment? What factors affect whether or not a species will survive in a certain region? How do ecosystems change over time?

The major goals of this course are for you to develop an appreciation of the **diversity** of life on earth, and understand how these groups came about and are related to each other (**evolution**) and how they persist and interact in their environment (**ecology**).

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

*“Nothing in biology makes sense except in the light of evolution.”*  
Theodosius Dobzhansky

### III. Student Learning Objectives

If we succeed in our objectives, what will you gain from this class?

1. You will be able to describe the species concept, how speciation happens, how natural selection results from ecological processes acting on phenotypic variation over long timescales, and the history of life on earth (**evolution**).
2. You will be able to identify and classify the major groups of life on earth based on shared, derived characteristics and innovative adaptations (**evolution, diversity**).
3. You will be able to describe the basic biology (life cycles, internal and external features, ecology, and evolutionary history) of the major groups of life on earth (**diversity**).
4. You will be able to explain ecological concepts including biomes, population growth, food webs and interactions, energy flow and nutrient cycling through ecosystems, and factors affecting biodiversity (**ecology**).
5. You will be able to apply these concepts to your own investigations of the natural world.
6. You will be able to pose hypotheses from observations, interpret biological data (including x-y graphs and bar graphs), and use data to draw conclusions.
7. You will be able to effectively communicate biological concepts in written, oral, and visual formats.

### IV. Learning Environment and Responsibilities

#### My Teaching Philosophy and Responsibilities

- I strive to foster a “student-centered classroom.” What does this mean? It means the number one reason I am here is to help each and every one of you become outstanding scientists and to develop as fully actualized human beings. I am concerned about the success of every student in my class.
- Our goal in this class is not to cover every topic in biology. This is an impossible task in a lifetime, let alone a one-semester class! Instead, we will focus on the *most important concepts* in organismal biology and on improving our skills to think and act like scientists. I would be supremely happy if all of you leave this class with an increased level of wonder about the natural world and an increased passion for asking questions and finding answers using the scientific process.
- A student-centered classroom is:
  - *Interactive*: in every class session I will ask you to discuss ideas with your neighbors and write down your own ideas;

- *Inquiry-driven*: once we've learned concepts we will apply our knowledge to try to answer questions using the scientific method;
- *Cooperative*: you will work closely with your peers to insure we are learning and growing;
- *Relevant*: we will identify how every topic we examine in this class is connected with the everyday world all around us
- I strive to give you frequent and helpful feedback on your progress, and give you advice about how to improve your knowledge and skills as a scientist.
- I will also strive to make our class as interesting as possible, maybe even fun or humorous.
- I will help you prepare for exams by giving you 'signposts' along the way to focus your study.
- I will answer questions respectfully and will begin and end class on time.
- I will be fair to all students.
- I will seek feedback from students about the course and my teaching, and always try to improve the learning environment.

### Your Responsibilities as a Student

- You should actively participate in class discussions, group activities, and peer-peer teaching.
- You should come to class having completed the readings and assignments.
- You should actively engage in the topics outside of class by exploring the wide world of biology in the real world and through media; discussing biology concepts with your classmates, other students, and friends; and thinking deeply about what evolution, diversity, and ecology mean for how we, as humans, live in the world.
- You should communicate your concerns and questions about the course to the instructor. I am here to help you. There are no silly questions or worries. Any issues that are preventing you from succeeding are important; I will take them seriously and do my best to help.
- You should seek out other resources to help you succeed. Many services are offered by the university, including one-on-one tutoring at the library [[csustan.edu/tutoring](https://www.csustan.edu/tutoring)] and in the CVMSA commons on the first floor of Naraghi Hall. Additionally, the university offers excellent counseling services [[csustan.edu/counseling](https://www.csustan.edu/counseling)] in MSR210 and health services [[csustan.edu/health-center](https://www.csustan.edu/health-center)].
- You should maintain your academic integrity. Your integrity is your most valuable asset in your academic and professional career. It is more valuable than any grade. Your integrity reflects your own moral character and sense of self. Please, resist any temptation to "borrow" the work and ideas of someone else. If you have concerns about your grade, please come speak to me privately in office hours about it. I encourage everyone to review how we define plagiarism in an academic setting on this webpage [<https://www.csustan.edu/grow/academic-integrity-plagiarism>]. Anyone caught plagiarizing or cheating will receive an F on the exam or assignment, and depending upon the severity of the infraction, may also receive an automatic F in the course. In order to uphold standards of high academic integrity, I reserve the right to ask a student I suspect of cheating to take a second, different exam on the material.
- You should take exams and turn in assignments on the scheduled days and times. If you have a legitimate excuse, you need to contact me *prior* to the due date or exam date in order to arrange an alternate scenario for completing the work. If an emergency prevents you from attending class, you need to contact me as soon as possible and provide evidence of the emergency.
- You should respect the rights and humanity of everyone else in the class. This especially includes being conscientious of your own actions and the potential to disturb others who are trying to learn. Let's discuss some ground rules:

## V. Required Course Materials

### 1. Campbell Biology 10<sup>th</sup> edition, with Mastering Biology.

- You should have this book from taking BIOL 1050. If you have the 9<sup>th</sup> edition it will be fine too, although a few minor things will be different.
- It is available in many formats, but I highly recommend the loose-leaf three-hole-punched version so you can bring just the chapters you are reading with you to class.
- This book is the standard biology textbook used in colleges around the country. It is easy to read, has great figures, and has good online resources.
- You will need to complete homework assignments on mastering biology, so make sure you have purchased the module. The course name on <http://masteringbiology.com> is: MBCOVER43305

### 2. Paper and pen/pencil.

- During *every* class period I will ask you to write down your responses to questions and turn in your paper at the end of class.
- Put your name and SID at the top right hand corner of the page, and number each question/answer.
- If your handwriting is difficult to read, please make a special effort to write as clearly as you can.

### 3. Blackboard course website

- You will need to have reliable access to the internet in order to access the Blackboard course website.
- We will make use of blackboard for discussion boards, web links to videos and other extra information, and announcements.

### 4. Email

- I will periodically send out updates and reminders via email. It is important that you regularly check your csustan email address, at least once per day, or you set up automatic email forwarding to another email account you check more frequently. This is easy to do by signing in to your csustan email at: <https://www.csustan.edu/StudentEmail/> and clicking on "Settings."

Note: i>clicker is NOT required for this course.

## VI. Assessment of Learning Outcomes

Grades will be based on exams, Mastering Biology homework, in-class assignments, and an independent project. Additionally, your lecture grade will make up 2/3 of your overall grade for the BIOL 1150 course, while your lab grade makes up the original 1/3 of your total grade. 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 33.33% of the total.

### Exams

Exam 1- Evolution	100 pts
Exam 2- Non-Animal Life	100 pts
Exam 3- Animals	100 pts
Exam 4- Ecology	100 pts
Final Exam (comprehensive)	100 pts
Mastering Biology HW	150 pts
In-class Assignments (5 pts/day)	200 pts
Independent Project	150 pts
<b>TOTAL</b>	<b>1000 pts.</b>

## Exams

The most practical way to assess your understanding of the concepts covered in the course is through objective exams. There will be 5 exams: 4 at regular intervals covering specific topics, and one cumulative final exam. These exams will include a mix of short answer and multiple-choice questions. You do not need a scantron or blue book.

## Mastering Biology Homework

There will 8-10 Mastering Biology assignments during the semester. You will need to complete these on the MB website. I will give you a full week to complete each assignment. I will announce due dates in class and on blackboard.

## In-Class Assignments

Every day during class I will ask you to write your thoughts on a separate piece of paper, which you will turn in at the end of class. These “one-minute papers” are a very important part of the class. The process of writing down your thoughts and ideas will help you learn the material much better than passively listening. In addition to reading your responses and giving credit for participation, I may also assign scores. It is most important to me that you take advantage of these opportunities to think and write, and that you make use of class time to do your best work. Short, poorly thought-out, or poorly prepared responses will not receive full credit.

## Independent Project

It is important that we gain practice in both *learning* science as well as *learning to do* science. Over the course of the semester I want you to perform your own independent project, which you will present during the last week of the semester. The project will involve a series of observations about a species or an ecosystem. You will then make a poster that details your observations and describes how your observations are related to the concepts we cover in this class (evolution, diversity, ecology).

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One final note:

### Letters of Recommendation

I enjoy writing letters of recommendation for students. Because they are letters of *recommendation*, however, I need to be able to recommend the candidate. As such, I can only recommend students who have excelled academically and/or exhibit qualities of dedication, intelligence, or leadership. If you do think you will need a letter from a professor, it is important that you get to know that professor by visiting office hours and taking part in research, internships, or individual study. Otherwise your letter will not be as strong.

And...

One final quote:

*“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)

**BIOL 1150 Schedule** (changes are possible- any changes will be announced in class and via email)

Numbers in bold refer to chapter numbers in Campbell.

Date	Topics
28-Jan	Syllabus
30-Jan	<b>22</b> Darwin and Natural Selection
2-Feb	<b>23</b> Evolution of Populations
4-Feb	<b>24</b> Speciation
6-Feb	<b>24</b> Speciation
9-Feb	<b>25</b> Time; Fossil Record
11-Feb	<b>25</b> Time; Fossil Record
13-Feb	<b>26</b> Phylogeny
16-Feb	<b>26</b> Tree of Life
<b>18-Feb</b>	<b>Exam 1- Evolution</b>
20-Feb	<b>27</b> Prokaryotes
23-Feb	<b>27</b> Bacteria/Archaea
25-Feb	<b>28</b> Protists
27-Feb	<b>29</b> Plant Evolution
2-Mar	<b>29</b> Alternation of Generations
4-Mar	<b>30</b> Seed Plants
6-Mar	<b>30</b> Flowering Plants
9-Mar	<b>30</b> Flowering Plants
11-Mar	<b>35</b> Plant Structure and Growth
<b>13-Mar</b>	<b>Exam 2- Non-Animal Life</b>
16-Mar	<b>31</b> Fungi
18-Mar	<b>32</b> Animal Diversity
20-Mar	<b>32</b> Tissues and Body Plans
23-Mar	<b>33</b> Invertebrates
25-Mar	<b>33</b> Arthropods-Insects
27-Mar	<b>34</b> Vertebrate Evolution
30-Mar	<b>34</b> Vertebrate Evolution
1-Apr	<b>40</b> Animal Form and Function
<b>3-Apr</b>	<b>Exam 3- Animals</b>
	<b>Spring Break</b>

Date	Topics
13-Apr	<b>52</b> Introduction to Ecology
15-Apr	<b>52</b> Climate and Biomes
17-Apr	<b>53</b> Pop Ecology
20-Apr	<b>53</b> Human Population
22-Apr	<b>54</b> Community Ecology
24-Apr	<b>54</b> Community Ecology
27-Apr	<b>55</b> Ecosystems
29-Apr	<b>55</b> Ecosystems
1-May	<b>56</b> Conservation Biology
4-May	<b>56</b> Global Change
6-May	<b>Exam 4- Ecology</b>
8-May	1 Synthesis: Biology and Society
11-May	Project Presentations
13-May	Project Presentations
15-May	Project Presentations
18-May	<b>Final Exam, 8:30-10:30</b>