

## Biodiversity, Evolution and Ecology (Bio 1) Course Information

**Summer 2015**

**Instructor:**

Dr. Ron Coleman

Office: 119 Humboldt

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<http://www.csus.edu/indiv/c/colemanr/index.html>
**Course Location & Times:**

Lecture (01) #50031	M, T, W, Th 8:00 to 9:35pm	Room SQU 316
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Lab (02) #50032	M, W 9:45pm to 12:55pm	Room Hmb 110
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Lab (03) #50033	M, W 1:00pm to 4:10pm	Room Hmb 110
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Activity (04) #50034	T, Th 9:45am to 11:55am	Room Hmb 102
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Activity (05) #50035	T, Th 12:00pm to 2:10pm	Room Hmb 102
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**Course Website:**
<http://www.csus.edu/indiv/c/colemanr/Courses/Bio1/bio1.html>
**Office hours:**

Ron Coleman

T, Th 2:10 - 3:10pm

Room HMB 119

**Course description:**

BIO 1. Biodiversity, Evolution and Ecology. Introduction to properties of life and cells leading to genetic and biological diversity. Survey of biological diversity emphasizing variation leading to natural selection; introduction to ecological concepts within an evolutionary framework; a survey of ecosystems and global climate change. Development of scientific skills will be emphasized. Designed for science majors. Lecture three hours; laboratory three hours; activity two hours; fee course. Note: Field trips may be required. Graded: Graded Student. Units: 5.0 This course satisfies General Education Area B2 and B3.

**Relationship with Other Courses:**

Bio 1 is the first course for those interested in pursuing a major in Biological Sciences. It is also taken by students in other majors who require an intense introduction to biology. For those who are interested in a less intense course in biology, I suggest you consider Bio 9, Bio 20 or Bio 22, each of which has a slightly different focus, but fulfills the General Education area B2 requirement. Bio 15 is a laboratory course which fulfills the General Education area B3 requirement. Bio 15 may be taken with any of Bio 9, Bio 20 or Bio 22.

Bio 1 is part of a two-course "introductory sequence", the other half being Bio 2. While Bio 1 covers biodiversity, evolution and ecology, Bio 2 covers cell and molecular biology. We try as much as possible to make these courses work together, e.g., you will use the same text book in Bio 2 as you are in Bio 1. As such, we cover only part of the text in Bio 1. You are welcome to read the other parts. Note that in order to take Bio 2, you must have completed Bio 1 AND Chem 1A. Plan carefully.

Some students might think that they have "covered" much of the material in Bio 1, perhaps in an advanced placement course in high school. This is a misconception. Throughout your training as a biologist, you will find that the topics often sound similar to those you have already taken, the difference is the increased depth and nuance that you should discover each time you examine a "familiar" topic. If you already think you know something, challenge yourself to learn it to a much more sophisticated level. If you are particularly well-versed in a topic, take the opportunity to teach what you know to your fellow students, and to try to understand why they might have difficulty understanding the topic.

**General Education Area B Learning Outcomes**

Students will be able to:

- Draw upon one or more of the life sciences to explain and apply core ideas and models concerning living systems and life forms, citing critical observations, underlying assumptions and limitations
- Describe how scientists create explanations of natural phenomena based on the systematic collection of empirical evidence subjected to rigorous testing and/or experimentation
- Access and evaluate scientific information, including interpreting tables, graphs and equations
- Recognize evidence-based conclusions and form reasoned opinions about science-related matters of personal, public and ethical concern

**Specific Learning Objectives for this course:**

- Identify the properties common to all living organisms
- Explain the biological basis of evolution
- Diagram the basic parts of a cell, and identify the structure and function of the major organelles
- Appreciate the diversity and complexity of major lineages of life on earth
- Recognize the major lineages of life on earth and understand the major characteristics of each lineage
- Discuss the ecological interactions among living organisms
- Explain major biogeochemical cycles
- Describe the basic properties of populations and interactions among different types of organisms within an ecosystem
- Analyze the interactions of different trophic levels within ecosystems
- Develop and test hypotheses using the scientific method
- Use basic scientific tools, including microscopes, computers, calipers, etc.
- Interpret scientific literature and employ scientific communication skills

**Attendance, Deadlines:**

Be an adult and take responsibility for your life and education.

I expect you to attend every lecture; you miss class at your own risk. Anything I say is fair game for exams, whether it is in the text or not. Some things I say will definitely not be in the text, and some may contradict the text. In the latter case, what I say is taken to be the correct answer. If there is a difference between what I say and what is in the text or what you have learned elsewhere, **please ask about** it in lecture or after class and we will discuss the differences.

My goal as a lecturer is to guide and assist you in learning about this material. I cannot do that if you are not in class or if you do not tell me what you do not understand.

If you miss a class, it is your responsibility to get the notes from another student, not from me. I DO NOT hand out lecture notes, nor do I post them to the web. Do you realize that missing a class will likely drop your grade in the course by almost a grade? Do you realize that attendance is one of the best predictors of success in a course? Students who miss more than two classes typically fail this course. Do not even think for a second that you can come to office hours to find out what you missed in class because you were not there. It is the first thing I will ask you. Office hours are for you to ask questions to clarify concepts and material that you heard in class but do not fully understand.

There is no way to “guess” on the exams, because they are short-answer and essay questions, so you need to understand the material, not just guess a letter.

Deadlines are strictly adhered to. It is not fair to students that complete work on time for other students to have extra time to do the same work. Plan ahead and schedule your time. Most importantly, do not leave things to the last minute; you do not need that kind of stress!

Bottom line: You cannot turn in assignments “late”. Late assignments are worth 0 (zero, nada, nothing, zippo...) and late means 1 minute late. So, an assignment turned in 1 minute late is worth 0.

**Code of Conduct**

You are an adult. I will treat you with respect, provided you treat me and your fellow students with respect. So, you must show up to class on time. You may not enter the class late. You may not leave the class early. You do not start packing up your bags until I **finish** speaking. You may not leave the class to go to the

bathroom unless it is an absolute emergency. All of these activities are very disruptive to me and to your fellow students. Repeat and/or flagrant violations of this code of conduct can cost you up to 20% of your grade.

You may eat and drink during the lecture, provided you are quiet. You may not bring food into the lab.

### **Email policy**

This course makes regular use of email. On occasion, I may send important messages to your Saclink account. As a Sac State student, you are responsible for regularly checking your Saclink email account (i.e., at least daily). Failing to do an assignment because you did not check your Saclink email account is your problem. Furthermore, when corresponding with me about this course, you **MUST** use your Saclink email account, not a gmail, yahoo or any other email account. This is an official University policy (IRT-0102, January 1, 2010).

### **Lab and Activity**

This course has a required lab and a required activity. You must enroll in and attend one of the lab sections, **AND** enroll in and attend one of the activity sections.

The purpose of the lab is to give you hands-on experience with the material.

The purpose of the activity is to allow you to explore the material in a different way, supplementing both the lecture and the lab.

You will **NOT** typically get out of any of these sections before the normal end-of-class time, so do not plan to do so, and do not make arrangements that require you to leave early. **EVER!**

### **Textbook:**

Raven, P.H., Johnson, G.B., Mason, K.A., Losos, J.B. and S.R. Singer (2014) Biology. Tenth Edition. McGraw-Hill, New York. ISBN 978-0-07-338307-1. **REQUIRED.**

Note that the bookstore sells a Looseleaf version of the text in conjunction with the ConnectPlus/LearnSmart electronic supplements. For my sections, you do not need to purchase ConnectPlus, however, it is very likely that you will use that system in Bio 2 in which case purchasing it now may be a good option.

### **Exams:**

There will be two midterms and a final for the course. Midterms are held during the lecture period and will be a mixture of short-answer and essay questions. I do not believe in multiple choice questions and do not use them. **EVER!**

Exams will be comprehensive, i.e., anything in the whole course up to that point in time is fair game; however, they will focus on the material since the previous exam.

The exams will focus on material in the lecture; however, because the purpose of the Activity is to help you understand the lecture, anything covered in the Activity is fair game for the lecture exam. Lab material will be tested in the lab, though you would be wise to recognize that there is substantial overlap between the lecture and the lab.

My previous students comment on two aspects of my exams: I am a hard grader and I am a fair grader. You can expect long exams that test your knowledge, but they will be exams without tricks. My goal is to have you tell me what you know and understand. You will have to work very quickly.

### **Grading:**

**This course is worth 5 units.**

The number of points/questions on a particular exam is irrelevant to the exam's worth -- it is merely a tool for grading. What matters are the following percentages. Your lecture grade will be calculated according to the following scheme:

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Midterm I	20
Midterm II	30
Final Exam	35
Term paper	10
Quizzes & Assignments	5
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	100%

Your final course grade will be calculated according to the following scheme:

Lecture	3/5	Lab 1/5	Activity 1/5
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Your letter grade will be calculated according to the following table:

A = 93 to 100%	C+ = 77 to 79.9%
A- = 90 to 92.9%	C = 73 to 76.9%
B+ = 87 to 89.9%	C- = 70 to 72.9%
B = 84 to 86.9%	D+ = 67 to 69.9%
B- = 80 to 83.9%	D = 60 to 66.9%
	F = 0 to 59.9%

I generally do not adjust or curve or scale grades; If you want an "A", work for it and make it happen!

I do not hesitate to correct any errors I make in grading (e.g., incorrect addition or if I missed grading an answer), but keep in mind that I am looking for clear, succinct answers, not answers that sort-of-show-you-possibly-might-know-what-you-mean. If you feel that your answer deserves a better grade, please return it to me promptly.

There are no "extra credit" assignments.

It is your responsibility to be aware of and understand university policies about drop dates, etc. For example, if you simply stop coming to class, you will be assigned an "F" for the course and you will not be allowed to "drop" the course after the drop deadline.

### Honor Code:

Do not cheat. Besides the fact that we will be forced to take strong measures if we catch you -- including recommending your dismissal from the class and from the university -- I will be profoundly disappointed in you. Most importantly, **cheating indicates that you are a failure as a human being.**

Don't even think about doing any of the following:

- giving or receiving information from another student during an examination
- using unauthorized sources for answers during an exam such as writing answers on hats, clothing or limbs
- illegally obtaining the questions before an exam
- altering the answers on an already-graded exam
- any and all forms of plagiarism
- destruction and/or confiscation of school and/or personal property

### Feedback:

I appreciate your feedback on this course. It is most useful to tell me things while the course is in progress, rather than waiting until the end of the course. If there is something that needs changing, LET ME KNOW and I will see what I can do about it. This course is a collaboration between you and me. I really enjoy teaching this class and I want you to have a great time as well.

**Bio 1: Tentative List of Lecture Topics. This list is subject to change.**

Week	Topic	Chapter
1 (Jun 1,2,3,4)	Introduction, My research Biodiversity – what is it and why does it matter? Scientific Method Generating Biodiversity: Evolution by Natural Selection	1, 22
2 (Jun 8,9,10,11)	Directions of Selection Species and Allopatric speciation The Tree of Life: organizing biodiversity (phylogenetics) <b>Jun 10: Midterm 1</b> <b>Jun 11: Term Paper Proposal due</b>	23,24,25
3 (Jun 15,16,17,18)	Phylogenetics continued (Vertebrate cladogram) Evidence for Evolution Origins of Life & Properties of Life Levels of Selection Mitosis, Meiosis Biodiversity: Bacteria, Archaea, Eukaryotes, Plants	25,26,27,28,29
4 (Jun 22,23,24,25)	Building a body: systems Mosses, ferns, gymnosperms, angiosperms, fungi, animals Invertebrates, Vertebrates <b>Jun 24: Midterm 2</b> <b>Jun 25: Term Paper Part I due</b>	29,30,31,32,33,34
5 (June 29,30, July 1,2)	Ecology, Invasive Species Ecosystems: definitions, distribution, scale Ecosystems and Biodiversity	52,56, 53
6 (July 6,7,8,9)	Competition, Predation, Mimicry, Symbiosis Trophic Cascades Biomes, Sexual Selection <b>July 8: Term Paper due</b> <b>July 9: Final Exam</b>	53, 54, 51