

**BIOLOGICAL PRINCIPLES II (BIO 107)
FALL 2009**

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COURSE DESCRIPTION: Biological Principles II (BIO 107) is the second course in USM's introductory biology sequence, and the laboratory portion is integrated with the lecture part of the course. Whereas the first semester (BIO 105K) focuses primarily on introductory cellular and molecular biology, the second semester concentrates on introducing the biology of organisms. We will discuss evolutionary concepts and survey members of kingdoms that include prokaryotes, "protists", plants, fungi, and animals, examining diversity and ways these organisms have solved the problems of survival and reproduction. We also will discuss fundamental ecological principles. The course is designed to provide you with a basic framework necessary to pursue upper division courses that specialize on particular topics or organisms; therefore, we do not spend much time on any one subject (i.e., we move quickly and do not delve into much detail).

This syllabus is meant to be a guide to the course for the semester; however, I reserve the right to make changes as necessary as we progress through the term.

COURSE PREREQUISITES: You must have earned grades \geq C- in both BIO 105K and BIO 106K (or comparable courses, if you are a transfer student) to enroll in this course.

COURSE OBJECTIVES: After successfully completing this course, you should be able to:

1. understand and explain the concept of evolution, mechanisms by which populations evolve, and processes by which new species arise;
2. understand and explain the basis for classification used by biologists, and how biologists use classification schemes to understand evolutionary relationships;
3. understand and appreciate the diversity of organisms and their evolutionary history;
4. understand and explain problems of survival and reproduction encountered by organisms and the myriad ways organisms solve these problems;
5. identify traits that prokaryotes, "protists", plants, fungi, and animals evolved that enable them to cope with their environments, and explain the functions of those traits;
6. understand and explain basic relationships and processes interconnecting organisms and their environments;
7. use quantitative reasoning skills to solve science problems;
8. understand and explain the process of science, including methods used to learn about the biological world;
9. read and summarize the scientific literature, identifying strengths and weaknesses of published work;
10. more clearly express your ideas about biology in written form.

EXPECTATIONS: To achieve many of the objectives listed above, you must arrive prepared for the day's events, which means you have read assignments prior to the start of class and you are prepared to ask and answer questions. I expect you to commit 9-14 hours each week, in addition to the scheduled class meeting time, to BIO 107. Thus, you must take an active role in the learning process. I cannot lecture twice each week and expect you to remember much of what I tell you; therefore, I expect to engage you in an interactive discussion of the material. Two months after this course is over, I do not expect you to remember details of the subjects we covered; however, I expect you to remember concepts that you can use in other courses and that can help you to understand biology encountered in your everyday life (e.g., when you watch television or read the news).

REQUIRED TEXTS FOR THE LECTURE COMPONENT:

Campbell, N.A. et al. 2008. *Biology*. 8th ed. Pearson Benjamin Cummings, San Francisco.
Pechenik, J. A. 2007. *A short guide to writing about biology*. 6th ed. Pearson Longman, New York.

ATTENDANCE POLICY: I consider college students to be adults and thus responsible for making their own decisions about whether or not to attend class. So I do not officially “take roll” during class. However, we discuss a great deal of material each week, and experience tells me that students benefit most from being present in class, both physically and mentally. Therefore, if you want to do well in this course, the first step is to arrive prepared for class and to participate.

COURSE WEB SITE: I have established a web page for this course, using Blackboard. You can access the web page through this URL: <http://www.courses.maine.edu>. Click the User Login button, then follow the directions on the right side of the page to log in. You should see a page that lists BIO 107 – Biological Principles II. Click on the link, and you will enter our course web site. This site will be a place where you can communicate with me, I can communicate with you, and you can communicate with each other. I will post announcements and reminders, the syllabus, reading assignments, study questions, and other important documents, relevant web sites, etc. Thus, this site will be an easy way to keep track of what’s happening in the course.

ACADEMIC INTEGRITY: Cheating, plagiarism, and fabrication of results all violate academic integrity and will not be tolerated in this course. Plagiarism is a form of cheating, so you must educate yourself about this practice. Plagiarism includes portraying words or ideas as one's own, i.e., taking credit for the work of others. Even if you paraphrase, if you do not give someone credit for his/her ideas, you commit plagiarism. You must paraphrase, cite sources and include a list of those sources. Any violations of academic integrity will be handled through the Office of Community Standards, according to University policy. For more information, see <http://www.usm.maine.edu/ocs>.

DISABILITIES AND SPECIAL CONCERNS: If you have a known or suspected learning disability or other special concern, please meet with me as soon as possible or contact the Office of Support for Students with Disabilities (780-4706) to arrange accommodations.

BASES FOR GRADE

1. **EXAMS:** To reinforce the material you learn, I will administer 3 exams during the semester. Each exam will cover material from class and the reading assignments. The format will consist of definitions, short answer, and short essay questions; typically, I include some questions that you must answer; in addition, I give you a choice of other questions.

You will be tested on basic information, comprehension of concepts, and application of those concepts to new situations. You cannot just memorize information we cover and expect to

repeat it back to me on exams. To do well, you must *understand* concepts and material you learn because I will ask you to show me a deeper level of learning that I hope persists after the course ends. This style of learning and testing is often a new experience for students, and it can be daunting. You cannot just “read the book” and expect to score well on these exams. You must prepare for them well ahead of time (trust me, an hour’s cramming before an exam is insufficient). To help you to succeed, I will post study questions, some of which may appear on the exams. I am willing to help you make the transition from the memorization type of learning to true comprehension of ideas, so please visit me.

Makeup policy: Missed exams cannot be made up except under unusual circumstances; you must notify me of any excuse, due to illness or other situation, *before* the exam. At my discretion, makeup exams may be oral exams, and they cover the same material as the original written exam. You must take the makeup exam no later than one week after the missed exam.

Regrade policy: If you believe I graded you unfairly on a question, you need to provide a written statement clearly explaining why you believe you deserve more credit for a particular answer. You must return the statement, along with the exam, to me no later than one week after you receive your graded exam. I will reevaluate your answers and provide you with my decision within one week.

2. FINAL EXAM: The final exam is comprehensive, but it emphasizes the “big picture,” drawing together material from throughout the course. It will consist of definitions, short answer and essay questions, and it will be given only at the scheduled time.

3. SUMMARIES: To further meet objectives 8, 9 and 10, you will prepare 2 assignments (about 2 pages each), each of which summarizes a recent paper (published \geq 2006) from the primary literature. You may choose papers on any biology topic of interest to you, but the paper must come from a peer-reviewed journal, and it must be an empirical paper, not a review, i.e., it contains new data, analysis and conclusions. You can check the Biology Department website for access to journals: http://www.usm.maine.edu/bio/3c_journal_links.htm. USM has free electronic access to many of these journals.

In the summary, you explain the context of the study, the authors’ objectives, their general approach (include only those details essential for our understanding), their results (describe patterns and trends explicitly enough that we can understand what the data “looked like”), and their conclusions. Furthermore, you must prepare the summary using your own words, i.e., you cannot cut and paste sentences or phrases from the journal article, and you cannot just modify a word or phrasing slightly and consider it your own work. The language must be substantially different from the authors’ original wording. Finally, at the end of the paper, you must identify and present one strength and one weakness of the research.

You should read chapter 7 in Pechenik for general advice about critiques (see other chapters of the book, too, for helpful hints about writing, in general). The critique must be word processed, double spaced, with 1” margins around all sides, numbered pages, and 10-12 point font. Do not include a separate title page. Include a copy of the article itself or a link to an online version of the article. NO LATE ASSIGNMENTS WILL BE ACCEPTED.

Grading: I will grade papers based on the following criteria: clarity, comprehension, completeness, and coherence. I will attach grade sheets, so my feedback and scoring are clear to you, and I will provide those grade sheets on Blackboard so you understand the requirements before the first due date.

To improve your writing skills, I will provide extensive feedback on your work. I also expect you to incorporate my comments into the next assignment, so your work improves over

the semester. Therefore, the second assignment will be worth a higher percentage of your final grade.

Due Dates:

MONDAY, 5 OCTOBER at the beginning of class (5% of final grade)

MONDAY, 2 NOVEMBER at the beginning of class (10% of final grade)

4. LABORATORY: One-third of your final grade will be determined by your performance in lab. You will receive more details in lab.

GRADE DETERMINATION:

Exams (3 @ 12%)	36%
Summaries (5% and 10%)	15%
Final exam	16%
Laboratory	<u>33%</u>
TOTAL	100%

Grades are curved according to the following procedure: I use the highest score earned on an exam as an indication of the best that students could do, and I curve from there, using the scale shown below. Final grades are determined in the same manner: I curve down from the highest number of points earned in the course. I will keep you apprised of your grade throughout the course, and I am willing to discuss grades with you at any time.

EXAMPLE: Let's say the highest grade on the first exam is 95 out of 100 points. The cutoff for an A- would be 90% of 95 pts., or 85.5 pts. Likewise, the lowest B would be 76 pts.; the lowest C would be 66.5 pts., and the lowest D would be 57 pts.

SCALE:

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

A word about extra credit: I do not give out extra credit assignments. Rather than investing time and energy in additional work, I prefer that you devote that time and energy to mastering material covered in the course. If you need help in doing that, please see me.

LECTURE SCHEDULE

WEEK	TOPICS	READING ASSIGNMENT
31 Aug	Introduction to the course; Evolution	Chapters 22, 23
7 Sep	M, 7 SEP: HOLIDAY Evolutionary processes	Chapters 22, 23
14 Sep	Speciation; Phylogenies	Chapters 24, 26
21 Sep	*M, 21 SEP: EXAM 1 Bacteria and Archaea	Chapter 27
28 Sep	Viruses; "Protists"	Chapters 19, 28
5 Oct	Plants *M 5 OCT: SUMMARY 1 DUE	Chapters 29, 30
12 Oct	M, 12 OCT: FALL BREAK *W, 14 OCT: EXAM 2	
19 Oct	Fungi	Chapter 31
26 Oct	Animals	Chapters 32, 33
2 Nov	Animals *M, 2 NOV: SUMMARY 2 DUE	Chapter 33
9 Nov	Animals W, 11 NOV: HOLIDAY	Chapter 34
16 Nov	Animals *W, 18 NOV: EXAM 3	Chapter 34
23 Nov	Population ecology W, 25 NOV: THANKSGIVING BREAK	Chapter 53
30 Nov	Population ecology; Community ecology	Chapters 53, 54
7 Dec	Community ecology; Ecosystems	Chapters 54, 55
M, 14 Dec	*FINAL EXAM – 4:15 – 6:15 PM	