

Foundations of Biology II

Bio 111



Spring, 2008

This course provides an introduction to the foundational concepts of biology. A combination of lectures, laboratory exercises, and assignments will introduce you to ways of observing and thinking about biology at the organismal level by exploring topics in biodiversity, plant and animal physiology, evolution, and ecology. Various resources in lecture and the laboratory will be used to reinforce important biological concepts, enhance the learning experience, develop practical abilities, and to improve critical thinking skills.

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Office hours: 10:30-11:30 Monday, Friday
11:00 – 12:30 Tuesday, Thursday
or by appointment

LECTURE 12:50 - 1:50, M W F

Phillips Lecture Hall

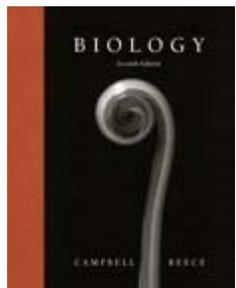
Attendance in lecture is expected. You will not be graded on attendance except indirectly through your grades on exams, assignments, and labs. Because your success in this course is strongly dependent on your presence in class and your participation, you should make an effort to be present at all class sessions. If you know ahead of time that you will miss class, let me know so we can make arrangements for you to attend another lecture section. Absence may be excused for personal emergencies or health-related problems. If you miss class, it is your responsibility to contact me and to obtain lecture notes and assignments that were given during your absence.

LABORATORY 2:00 - 5:00 Wednesday

342 Hoyt Science Center

Attendance in laboratory is required. You must notify me ahead of time if you know that you cannot be in lab so we can make arrangements for you to attend another lab section. Any missed group work must be made up independently and will be graded on an individual basis.

**REQUIRED
MATERIALS**



Textbooks: *Biology, 7/e*, by N. Campbell and J. Reece, © 2005, Benjamin Cummings Publisher

A Handbook of Biological Investigation, 6/e, by H. W. Ambrose III, *et al.*, © 2002, Hunter Textbooks, Inc.

Lab book: There is no lab manual for this course. All you will need is a blank, carbon-copy lab book (available in the book store).

PURPOSE OF THIS COURSE

1. To teach fundamental concepts of biology through the presentation of conceptual knowledge coupled with investigative laboratory experience;
2. To give insight into the complex nature of biological relationships at the molecular, cellular, and organismic levels;
3. To demonstrate the role of evolution in shaping the morphology, physiology, and behavior of all organisms;
4. To develop facility with the scientific method through experiences in the library, laboratory, field, and lecture and to demonstrate the potential and limitations of the scientific method.
5. To present some of the methods used in the biology laboratory and to show how those methods are used to develop questions and to test hypotheses. This includes:
 - a) hypothesis formation and experimental design;
 - b) the use of experimental methods of observation and measurement;
 - c) collection of data and analysis of data using appropriate graphical and statistical techniques;
 - d) development of conclusions based on data analysis; and
 - e) development of a familiarity with the common tools and types of information used by biologists;
6. To give an awareness of the many ways that the biological world affects humans and how, in turn, humans affect the world around them.

METHODS OF INSTRUCTION

1. **Lectures and discussion:** These will follow the schedule printed below. I expect you to attend class, pay attention, and participate actively in discussions by answering questions, asking questions, and making comments. Always bring your textbook to lecture.
2. **Reading:** The textbook that we have chosen provides a good general introduction to the field of biology. Most of the topics that we will approach in the class are covered by the book. Thus, it will serve to augment lecture and to provide material for discussion. Being prepared is a key to success in this course. Assigned reading should be completed before coming to class or lab. Take notes on your reading and keep track of any questions that arise for later clarification in class or during office hours.
3. **Laboratories:** This is a very important part of the course. The laboratory exercises will parallel what we are discussing in lecture, to increase your understanding of certain topics and to give you a different perspective on them. Lab exercises will also teach you new concepts and important skills. You will be required to keep a laboratory notebook which will be graded periodically throughout the semester. Keeping a laboratory notebook will help you develop organizational and problem solving skills and to practice analytical thinking; it will also help you synthesize what you have learned in lab and solidify the knowledge. You will write one formal lab report, an in-depth presentation of one lab exercise in the form of a scientific manuscript. You will also work with members of your lab group to give a presentation about one of the labs.
4. **Exams:** Periodic lecture exams will allow you to assess your progress in learning the information presented in the class. There will be five exams in this course. The first four will be over material contained in four or five chapters. The final exam will be comprehensive. You should expect multiple choice, short answer, and essay questions on the exams.
5. **Assignments:** In most cases, the assignments will relate to the material that we will be discussing the next week. Their purpose is to prepare you for the discussion or to give you more information or a different viewpoint on the material that is covered in the reading.
6. **Biology seminars:** There will be a number of biology seminars this semester – you are required to attend two of them. Immediately after each seminar, you will submit two questions that occurred to you as you listened to the presenter(s).
7. **Additional resources:** Take advantage of your resources. I am here for your benefit and will do whatever reasonable to help you in the course. Feel free to drop by my office or e-mail me any time you have questions or concerns. We will have weekly study sessions to answer questions and go over lecture and lab material. Your fellow students are another potential resource. Some students find study groups to be an effective learning strategy. You may also take advantage of a free tutoring service provided by upper-class biology majors in Beta Beta Beta, Westminster's biology honorary society. Finally, the study guide that accompanies the textbook contains list of concepts, chapter reviews, and questions to help you understand the material in the textbook and prepare for exams.

GRADING

Grades will be based on exams, lab notebooks, a formal lab report, assignments, and participation in biology seminars, weighted as follows:

Exams (four)	= 40% of final grade
Final comprehensive exam	= 10% of final grade
Lab notebooks	= 30% of final grade
Formal lab report	= 10% of final grade
Assignments	= 8% of final grade
Seminars	= 2% of final grade

Your final grade in the course will be based on the following scale:

Above 93%: A	87% - 90%: B+	77% - 80%: C+	67% - 70%: D+	below 60%: F
90% - 93%: A-	83% - 87%: B	73% - 77%: C	63% - 67%: D	
	80% - 83%: B-	70% - 73%: C-	60% - 63%: D-	

POLICY ON EXAMS AND ASSIGNMENTS

All assignments must be turned in by 5:00 p.m. on the day that they are due unless you are absent the day that the assignment was due and had a valid excuse. Valid excuses include such things as serious illness or injury and personal and family emergencies. Points will be subtracted from assignments turned in late. Occasionally, assignments may be due in class but we will let you know ahead of time if this happens.

You may turn in assignments in three ways:

1. **hard copy:** the least desirable method. Hand the paper to me, slide it under my office door, or give it to someone to deliver. *Do not use campus mail.*
2. **in the Assignments folder on the course r-drive:** if you save a file to the r-drive, the name of the file must contain your name and some indication of what it contains (e.g., the name of the file could be "Smith, Assignment 5"). You must save the file to another drive, then save it to the r-drive. If you try to save directly to the r-drive, the network will only write a blank temporary file and you will lose all of your work. Once you have saved something to the Assignments folder you will be unable to retrieve it, open it, or delete it.
3. **as an e-mail attachment:** Again, the name of the file must contain your name and some indication of what it contains. You can find out if I have received your messages by looking in the Sent Items folder in your mailbox.

ACADEMIC INTEGRITY

Academic integrity is central to the purpose and pursuit of any academic community. In this class, I expect you to adhere to the principles of academic integrity stated in the Westminster College handbook and to maintain the highest standards of academic honesty and integrity, in keeping with the philosophy and purposes of the College.

“Academic dishonesty is a profound violation of this expected code of behavior. It can take several forms, including, but not limited to, plagiarism, cheating, purposely altering the work of another (without that person’s permission), misrepresentation of attendance in class or at a College event, misrepresentation of work, facts or experimental results, unauthorized use of or intentional intrusion into another’s computer files and/or programs, intentional damage to a computer system, unauthorized use of library materials and privileges, or engaging in any activity which attempts to alter or harm another’s academic standing.”

You must always guard against potential plagiarism. Plagiarism includes extensive quoting, paraphrasing, or copying from any other source (books, articles, websites, other students’ work, or class material), incorrect or inadequate citation of quotes, data, ideas, or images, and directly copying experiments or research projects that have been developed by another student or published by another researcher. I encourage you to work together and discuss your assignments with other students, but all material that you turn in must be your own work.

Quotes, data, graphs, photographs, or ideas taken from another source must be cited correctly. If you have any doubts about whether you need to cite a source – YOU MUST ASK. In accordance with College policy, if there is plagiarism in one of your assignments, you will receive a score of zero for that assignment and a written report will be sent to the Dean of Academic Affairs. More than one incident of plagiarism may result in your being awarded an F for the course.

TENTATIVE SCHEDULE OF LECTURE TOPICS AND READINGS

DATE	TOPIC	READING
January 23	Introduction to the course Phylogeny and systematics	Ch. 25 ; Overview, section 25.2 (pp. 491, 495 – 497)
January 25	Introduction to biological diversity	Ch. 26 ; Overview, sections 26.1-26.3 (pp. 512- 523)
January 28 January 30	Introduction to biological diversity Viruses	Ch. 26 ; sections 26.4-26.6 (pp. 523-531) Ch. 18 ; Overview, section 18.1-18.2 (pp. 334-337, 343-345) Ch. 27 ; Overview, sections 27.1-27.3 (pp. 534-544)
February 1	Prokaryotes	
February 4	Prokaryotes	Ch 27 ; sections 27.4-27.5 (pp. 544-547)
	Protists	Ch. 28 ; Overview, section 28.1 (pp. 549-551)
February 6	Protists	Ch. 28 ; sections 28.2-28.8 (pp. 552-569)
February 8	How plants colonized land	Ch. 29 ; Overview, sections 29.1-29.2 (pp. 573-579)
February 11	How plants colonized land	Ch. 29 ; sections 29.3-29.4 (pp. 580-588)
February 13	The evolution of seed plants	Ch. 30 ; Overview, sections 30.1-30.3 (pp. 591-595, 602-606)
February 15	Fungi	Ch. 31 ; Overview, sections 31.1- 31.3, 31.5 (pp. 608-612, 620-623)
February 18	Plant structure and growth	Ch. 35 ; Overview, sections 35.1 – 35.3 (pp. 712- 724)
	Exam #1, 7:00 p.m.	Chapters 18, 25, 26, 27, 28, 29, 30, 31
February 20	Transport in vascular plants	Ch. 36 ; Overview, sections 36.1-36.2 (pp. 738-746)
February 22	Transport in vascular plants	Ch. 36 ; sections 36.3- 36.5 (pp. 746-753)
February 25	Plant nutrition	Ch. 37 ; Overview, sections 37.1-37.4 (pp. 756-768)
February 27	Angiosperm reproduction	Ch. 38 ; Overview, section 38.1 (pp. 771-776)
February 29	Angiosperm reproduction	Ch. 38 ; sections 38.2-38.4 (pp. 776-786)

DATE	TOPIC	READING
March 3	Plant responses	Ch. 39 ; Overview, sections 39.2-39.3 pp. (791-808) Omit "Systems biology and hormone interactions" (pp. 801-2)
March 5	Plant responses	Ch. 39 ; sections 39.4-39.5 (pp. 808-815)
	Introduction to animal diversity	Ch. 32 ; Overview, section 32.1-32.3 (pp. 626-633)
March 7	Invertebrates	Ch. 33 ; Overview, section 33.1-33.3 (pp. 638-650)
March 10	Invertebrates	Ch. 33 ; sections 33.3-33.5 (pp. 650-655)
March 11	Exam #2, 7:00 p.m.	Chapters 31, 35, 36, 37, 39
March 12	Invertebrates	Ch. 33 ; sections 33.6-33.8 (pp. 655-667)
March 14	Vertebrates	Ch. 34 ; Overview, sections 34.1-34.6 (pp. 671-694)
March 15 – 24	Spring break	
March 26	Vertebrates	Ch. 34 ; sections 34.7-34.8 (pp. 694-707)
March 28	Principles of animal form & function	Ch. 40 ; Overview, sections 40.1-40.3 (pp. 820-831)
March 31	Principles of animal form & function	Ch. 40 ; sections 40.4-40.5 (pp. 833-841)
April 2		Ch. 41 ; Overview, sections 41.1-41.3 (pp. 844-855)
April 4	Animal nutrition Animal nutrition	Ch. 41 ; sections 41.4-41.5 (pp. 855-864)
April 7	Circulation and gas exchange	Ch. 42 ; Overview, sections 42.1-42.3 (pp. 867-878)
April 9	Circulation and gas exchange	Ch. 42 ; sections 42.3-42.6 (pp. 879-890)
April 10	Exam #3	Chapters 32, 33, 34, 40, 41, 42
April 11	Introduction to ecology	Ch. 50 ; Overview, sections 50.1-50.2 (pp. 1080-1092)

DATE	TOPIC	READING
April 14	Introduction to ecology	Ch. 50 ; Overview, sections 50.3-50.4 (pp. 1080, 1092-1104)
April 16	Population ecology	Ch. 52 ; Overview, sections 52.1-52.4 (pp. 1136-1147) Corn and plant nutrition labs due
April 18	Population ecology	Ch. 52 ; sections 52.5-52.6 (pp. 1148-1156)
April 21	Community ecology	Ch. 53 ; Overview, sections 53.1-53.2 (pp. 1159-1171)
April 23	Community ecology	Ch. 53 ; section 53.3 (pp. 1171-1175) Conclusions of the physiology lab due
April 25	Ecosystems	Second draft of the formal lab due Ch. 54 ; Overview, sections 54.1-54.3 (pp. 1184-1194)
April 28	Ecosystems	Ch. 54 ; sections 54.4-54.5 (pp. 1194-1206) Assignment #3 due
April 30	Conservation biology	Ch. 55 ; Overview, section 55.1 (pp. 1209-1211)
May 2	Conservation biology	Ch. 55 ; section 55.1 (pp. 1211-1214) Assignment #4 due
May 5	Human impact on the environment Exam #4, 7:00 p.m.	Chapters 50, 52, 55
May 6	Review	Extra credit due in class
May 7	Reading Day	
May 8, 3:00-5:30	Comprehensive final exam	
May 12, 5:00 p.m.		Final version of the formal lab due