

Foundations of Biology III

Bio 203



Fall, 2009

This is the final course in a three-course sequence designed to provide an introduction to the foundational concepts of biology. It is designed primarily for students who are majoring or minoring in biology, and for environmental science majors. Scientific knowledge is attained through curiosity and a desire to explore. During the semester, we will explore fundamental biological topics in evolution, ecology, and biodiversity. Various resources in lecture and the laboratory will be used to reinforce important concepts, enhance the learning experience, develop practical abilities, and improve critical thinking skills.

INSTRUCTOR Dr. Ann Throckmorton, Professor of Biology

Office: 311 Hoyt Science Center
Phone: 724-946-7209
e-mail: athrock@westminster.edu
Home Page: <http://www.westminster.edu/staff/athrock/>
Office hours: 10:30 - 11:30 Monday, Friday
9:20 – 10:50 Tuesday
or by appointment

LECTURE 12:50 - 1:50, Monday/Wednesday/Friday Phillips Lecture Hall

Attendance in lecture is expected, although 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 notes, information, and assignments that were given during your absence.

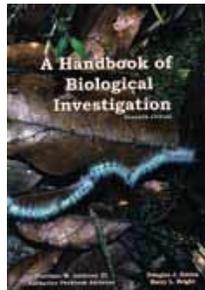
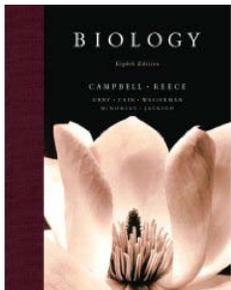
LABORATORY 2:00 - 5:00 Wednesday

319 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, 8/e*, by N. Campbell and J. Reece, *et al.* © 2008, Pearson Benjamin Cummings Publisher



A Handbook of Biological Investigation, 7/e, by H. W. Ambrose III, *et al.*, © 2007, Hunter Textbooks, Inc.

Lab book: There is no lab manual for this course. All lab exercises will be saved on the course r-drive: you are responsible for printing them to bring to lab each week. You will also need a blank, dual-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 experiences.
2. To give insight into the intricate nature of biological relationships at different levels, from organisms to ecosystems, and to illustrate the complex interactions between organisms and their environment.
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 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) collection of data using experimental methods of observation and measurement;
 - c) 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, techniques, 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 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 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 an oral 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 a small number of chapters. The final exam will be comprehensive. You should expect multiple choice, short answer, and essay questions on the exams; matching, true/false, and fill-in-the-blank questions may occasionally appear.
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:** Throughout the semester, you will have the opportunity to attend numerous seminars given by biology faculty or other professionals in the field of biology. You are required to attend two of them. After each seminar, you will submit a one to two page summary of the talk, ending in a paragraph in which you describe your personal reaction to the topic or presentation.
7. **Additional resources:** Take advantage of your resources. Feel free to drop by my office or e-mail me any time you have questions or concerns. If you want, we will have weekly study sessions to answer questions and go over lecture and lab material. A published study guide will be available in Mack Science Library. I will also post study aids on the r-drive, including outlines and objectives for each chapter. Your fellow students are another potential resource. Some students find studying in 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.

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 notebook	= 25% of final grade
Formal lab report	= 10% of final grade
Assignments	= 10% of final grade
Seminars	= 5% 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 I 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"). Do not save any files directly to the r-drive. 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. All materials that you turn in electronically will be submitted to Turnitin.com, an on-line plagiarism detection and prevention tool. 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 COURSE SCHEDULE

DATE	TOPIC	READINGS AND ASSIGNMENTS
September 02	Introduction to the course	Chapter 52: overview, sections 52.1-52.2 (pp. 1148-1155)
	Introduction to ecology and the biosphere	
September 04	Introduction to ecology and the biosphere (continued)	Chapter 52: sections 52.2-52.3 (pp. 1155-165)
September 07	Introduction to ecology and the biosphere (continued)	Chapter 52: section 52.4 (pp. 1166-1171) Assignment #1 assigned
September 09	Population ecology	Chapter 53: overview, sections 53.1-53.2 (pp. 1174-1180)
September 11	Population ecology (continued)	Chapter 53: sections 53.3-53.5 (pp. 1181-1190) Assignment #1 due
September 14	Population ecology (continued)	Chapter 53: section 53.6 (pp. 1190-1195)
September 16	Animal behavior	Chapter 51: overview, sections 51.1-51.3 (pp. 1120-1132)
September 18	Animal behavior (continued)	Chapter 51: section 51.4 (pp. 1133-1138)
September 21	Animal behavior (continued)	Chapter 51: section 51.5 (pp. 1138-1142)
September 23	Community ecology	Chapter 54: overview, section 54.1 (pp. 1198-1203)
September 25	Exam #1	Chapters 51, 52, 53
September 28	Community ecology (continued)	Chapter 54: section 54.2 (pp. 1204-1210)
September 30	Community ecology (continued)	Chapter 54: sections 54.3-54.5 (pp. 1211-1219)
October 02	Ecosystems	Chapter 55: overview, sections 55.1-55.3 (pp. 1222-1230)

DATE	TOPIC	READINGS AND ASSIGNMENTS
October 05	Ecosystems (continued)	Chapter 55: section 55.4 (pp. 1231-1236)
October 07	Ecosystems (continued)	Chapter 55: section 55.5 (pp. 1236-1242) Assignment #2 assigned
October 09	Conservation biology and restoration ecology	Chapter 56: overview, section 56.1 (pp. 1245-1250)
October 12	Conservation biology and restoration ecology (continued)	Chapter 56: sections 56.2-56.3 (pp. 1250-1260) Assignment #2 due
October 14	Conservation biology and restoration ecology (continued)	Chapter 56: sections 56.4-56.5 (pp. 1260-1265)
October 16	Exam #2	Chapters 54, 55, 56
October 17-20	Mid-semester break	
October 21	Phylogeny and the tree of life	Chapter 26: overview, sections 26.1-26.3 (pp. 536-548)
October 23	Phylogeny and the tree of life (continued)	Chapter 26: sections 26.4-26.6 (pp. 548-553)
October 26	Bacteria and Archaea	Chapter 27: sections 27.1-27.3 (pp. 556-565)
October 28	Bacteria and Archaea (continued)	Chapter 27: sections 27.4-27.6 (pp. 565-573)
October 30	Protists	Chapter 28: overview, sections 28.1-28.3 (pp. 575-589) Assignment #3 assigned
November 02	Protists (continued)	Chapter 28: sections 28.4-28.7 (pp. 589-597)
November 04	Plant diversity I: How plants colonized land	Chapter 29: overview, sections 29.1-29.2 (pp. 600-610)
November 06	Plant diversity I: How plants colonized land (continued)	Chapter 29: section 29.3 (pp. 610-615) Assignment #3 due

DATE	TOPIC	READINGS AND ASSIGNMENTS
November 09	Plant diversity II: The evolution of seed plants	Chapter 30: overview, sections 30.1-30.3 (pp. 618-628)
November 11	Plant diversity II: The evolution of seed plants (continued)	Chapter 30: sections 30.3-30.4 (pp. 628-634)
November 13	Exam #3	Chapters 26, 27, 28, 29, 30
November 16	Fungi	Chapter 31: overview, sections 31.1-31.3 (pp. 636-641)
November 18	Fungi (continued)	Chapter 31: sections 31.4-31.5 (pp. 641-652)
November 20	Introduction to animal diversity	Chapter 32: sections 32.1-32.4 (pp. 654-665)
November 23	Invertebrates	Chapter 33: overview, sections 33.1-33.3 (pp. 666-682)
November 23-29	Thanksgiving break	
November 30	Invertebrates (continued)	Chapter 33: section 33.4 (pp. 683-692) Assignment #4 assigned
December 02	Invertebrates (continued)	Chapter 33: section 33.5 (pp. 693-695)
December 04	Vertebrates	Chapter 34: overview, sections 34.1-34.2 (pp. 698-703)
December 07	Vertebrates (continued)	Chapter 34: sections 34.4-34.6 (pp. 705-720) Assignment #4 due
December 09	Vertebrates (continued)	Chapter 34: sections 34.7-34.8 (pp. 720-733)
December 11	Exam #4	Chapters 31, 32, 33, 34
December 14	Review	
December 15	Reading day	
December 19, 11:30 – 2:00	Comprehensive final exam	Chapters 26, 27, 28, 29, 30, 31, 32, 33, 34, 51, 52, 53, 54, 55, 56