

BIOL 100 (INTRODUCTION TO BIOLOGY) SYLLABUS

Semester/Year: Fall 2009

Section(s): 18 and 19

Instructor's Information: Prof. Casimir

Fax 773-442-4085

Office Location: EL Centro

Telephone Number: 773-442-4080

Email Address: L-Casimir@neiu.edu

Office Hours: M-Th 3;30-4-10 Sat 9;00-9:15

Class Hours, Building(s), and Classroom(s):

El Centro

Required Materials:

Textbook: Campbell et al. Essential Biology with Physiology. 2nd Edition. Pearson / Benjamin Cummings. 2006. Also available in a shorter, cheaper NEIU custom version from Beck's.

Lab Manual: Introduction to Biology Lab Manual. 7th Edition. 2008. (Available only at Beck's Bookstore).

Gloves: Several labs (enzyme lab, pig dissection labs) during the semester will require you to wear disposable latex (or latex alternative) gloves.

Course Description:

This course meets the general education requirement for a science course with a lab. It is a 3-hour course with both lecture and laboratory components that addresses the fundamental issues and tenets of biology.

Before a typical lecture session you will be required to complete readings in the text and complete assignments on Blackboard based on those readings. During a typical lecture you will be expected to participate in class and small group discussions and take careful notes on information that is generated both in discussions and in instructor presentations.

In a lab, you will have the opportunity to design and conduct experiments, as well as to complete other activities that will help you better understand the fundamental tenets of biology. There is an assignment or practical exam related to each lab session, so it is necessary to participate in each lab session and to regularly check the schedule for due dates. There are several pre-lab quizzes throughout the semester that must be taken on Blackboard **before** the beginning of the laboratory session.

By the end of the semester, you should grasp and be able to speak to or write about the importance of the following concepts for biology:

1. What is life?
 - a. Life requires organization and stability. Living organisms respire, respond to their environment, and reproduce.
2. Form follows function
 - a. All living things are made of millions of "tools" working together. The shape of a "tool" determines its job; changing its shape alters its function.
3. Energy flow in living organisms
 - a. Plants use photosynthesis to convert the sun's energy into sugars needed for life; whereas consumers must convert plant sugars into ATP to meet their energy requirements.
4. The Scientific Method

- a. Science is a process. The more experiments a hypothesis has survived, the more it tends to be accepted.
- b. We learn as much from failure as we do from success.

In addition, you should be able to complete the following exercises to prove your understanding of the concepts stated above.

- Students will be able to associate behaviors of their own bodies and of other organisms with characteristics of living things.
- Students will be able to analyze a family pedigree to explain the inheritance of a given genetic trait.
- Given a population of organisms, students will be able to predict how that population will change over time as a consequence of changes in its bio-physical environment, migration, natural disasters, etc.
- Given a biological task, students will be able to predict, design, or choose the best shape for an object that would accomplish a task. Furthermore, students will be able to predict how changes to the shape of the object will affect its ability to carry out each task.
- Students will correlate the potential energy and macromolecules entering the human body after eating a sandwich (bread, meat, cheese), with the kinetic energy needed to exercise and the macromolecules needed to build body tissue.
- Given a change in an organism, students will be able to determine whether (a) that change required or released energy and (b) where that energy came from before the change, or went to after it.
- Students will be able to contrast the levels of scientific knowledge behind a hypothesis, a theory, and a law (noting that even laws are not infallible), and define each from a scientific experiment.
- Students will be able to outline the steps of the scientific method for each lab, generate predictions, maintain the distinction between predicted and observed results, and appropriately analyze and interpret graphs.

The goal of the General Education Program is to assist students in developing the following:

1. **Communication:** The ability to communicate both in writing and orally. *You will be expected to communicate in writing in this course by journaling. In addition, you will be expected to communicate orally during lecture and laboratory sessions at minimum on a small group level.*
2. **Critical Thinking:** The skills required to gather, analyze, document, and integrate information. *During laboratory sessions you will be required to gather information, analyze graphs, charts, and experimental results, document those results, and integrate the information into a scientific conclusion.*
3. **Diversity:** An understanding of historical processes and cultural differences. *You will be exposed to the history of scientific processes.*
4. **Aesthetics:** An understanding of aesthetic and literary sensitivity. *This goal will not be addressed in this course.*
5. **Modes of Thought:** An understanding of the modes of thought, concerns, and methodologies of the fine arts, the humanities, the social and behavioral sciences, and the natural sciences. *You will have an understanding of the modes of thoughts, concerns, and methodologies of the natural sciences, particularly biology.*

6. **Quantitative literacy:** The ability to use quantitative methods in the natural, social, and behavioral sciences. *Through analysis in lecture and laboratory, you will use quantitative methods to understand issues in biological science.*

<i>Lecture (600 points)</i>	Points
Activity on Blackboard completed by the second day of class.	2
3 exams at 150 points each. <i>The lowest exam score will be dropped at the end of the semester. No make-up exams will be given. If you miss an exam, the missed grade will be your dropped grade.</i>	300
Final exam. <i>Some material will be new, but the remainder will be cumulative. The final cannot be dropped. Make-ups are allowed only in the case of a documented illness or emergency.</i>	150
12 assignments at 4 points each. <i>These points will be awarded for each assignment that is completed on time (10 minutes before the start of lecture each week).</i>	48
5 of these Assignments will be chosen at random to and graded in detail for 20 <u>additional</u> points each.	100
<i>Lab (400 points)</i>	
12 Lab Write Ups / Pre-lab Blackboard quizzes at 25 points each.	300
1 Practical exam on the fetal pig dissection.	50
1 Natural Selection assignment (based on in-lab activities <u>or</u> Field Museum field trip).	50
TOTAL	1000

Grading (points):

A: 1000-900 **B:** 890-800 **C:** 790-700 **D:** 690-600 **F:** 590-0

Exams: Exams will consist of short answer and / or multiple choice questions. The exams and quizzes will not only test whether you know the material, but your ability to use what you know to solve problems. In other words, you will be required to “think” rather than to simply “memorize,” and you must be able to relate different topics to one another.

Assignments: To help you regularly prepare for class, you will be required to complete a total of 12 assignments throughout the semester. These assignments will be based on required readings or in class discussions. **Each assignment entry must be posted on Blackboard before the beginning of the day’s lecture session.** You will receive 4 points for each assignment that is posted on time. Five randomly chosen assignments will be graded in detail throughout the semester for 20 additional points – late postings will not receive credit. The 5 dates may differ for different students. Your 20 point grade will be based on the following grading rubric:

20 points: Thoughtful and complete response **18 points:** Good response, but lacked one key element **15 points:** Response was not as thoughtful as required **10 points:** Response didn't demonstrate an adequate understanding **4 points:** Response was incomplete and marginally acceptable **0 points:** Not submitted **-2 points:** Plagiarism or not citing a source when needed

Lab Write Ups / Pre-lab quizzes: There is a pre-lab quiz and / or post-lab write up related to every lab activity. Pre-lab quizzes are open-book and must be taken on Blackboard before the beginning of the laboratory session. Pre-lab quizzes and lab write ups are each worth 25 points.

Those points will generally be awarded according to the following rubric: “Superior” = 25 pts., “sufficient” = 18 pts., “insufficient” = 10 pts., and “absent or not submitted” = 0 pts.

Attendance: Attendance is mandatory for both lecture and laboratory sessions. During each lecture period, there will be a class discussion from which the instructor will develop exam questions. You will only be able to participate in the class discussion (and learn the material presented in the discussion) if you are present. You may also be required to complete assignment entries based upon the class discussion.

Laboratory experience is an essential part of this course and constitutes 40% of your final grade. If you must miss a laboratory session, it may be possible to attend another session *if you make arrangements in advance*. Otherwise, it is not possible to make up missed laboratory sessions.

Required Reading Assignments: Before each lecture period, you must complete the required reading assignment and related assignment entry. Completing the required reading will help you better understand material presented in lecture and lab and enable you to participate in small group discussions and laboratory exercises. In addition, regular reading (and regular studying) will make it easier to study for exams.

Helpful Hints for Reading a Textbook: (modified from www.oakton.edu/learn): Reading a textbook is a special skill and it is very different from reading a newspaper, magazine, or novel. When you read for your own pleasure, you may not have to retain details. Textbook reading is more difficult and you are expected to learn a considerable amount of material. By following the techniques below, you can save time and read more efficiently.

1. *Overview:* At the beginning of the semester, become familiar with the species features of your textbook. Skim the table of contents and check if there is an index and glossary.
2. *Preview:* To focus better on the significant points, preview your chapter before reading it. Read the chapter title, the interesting “facts” introduced on the first page of the chapter, and the chapter objectives. Skim through the chapter and read the subheadings. Finally, examine each diagram and read its caption. As you have probably heard, a picture is worth a thousand words. The text is often easier to understand after examining the diagrams.
3. *Questions:* Your textbook lists questions (called “Checkpoint”) at several points throughout the chapter. Before you read each chapter section, skim ahead to read the questions. Then, you will be able to focus on the essential information as you read. *Even better:* Make up your own questions before you read, by using key words, graphics, section headings, or topic sentences.
4. *Read:* Concentrating on the material is easier when you read to answer the questions in the text or the ones you formed. Also, depending upon how you learn best, underlining, highlighting, taking notes, making charts or flash cards, or reviewing aloud will help you remember what you have read and will save you time when you are studying for tests.
5. *Review:* One of the best investments of your time will be to review what you have read, either orally or by writing. By reviewing for a few minutes after reading, you will dramatically improve your retention. Experiment a little to find the strategy that works best for you. I like to stop reading at the end of each chapter section (or at the end of a group of paragraphs if the chapter section is long) and review the material by writing the key points in my own words. First, I close the text and try to write the key

points as well as I can from memory. Then, I open the textbook and “fill in the blanks” by including the material I missed, still being careful to write in my own words. Another good strategy is to study with a partner and to take turns explaining concepts to one another.

A Note on Original Work: Students are expected to adhere to the University Student Conduct Code <http://www.neiu.edu/~DeanSt/survival/conduct.pdf> When individual efforts are called for, they must be accomplished alone. Assignment entries must be written in your own words. Even copying one sentence, without quote marks and a source reference, whether that sentence is from a book, article, or the internet, is plagiarism. *Any violation to the Code of Student Conduct (such as cheating or plagiarism) is grounds to fail the course. In addition, the violation will be referred to the Office of the Dean of Students and additional sanctions may be imposed by the university.*

Withdrawing From the Course: Students who wish to withdraw from the course must do so themselves through the Touchtone Telephone Registration System (TTRS). Neither the faculty nor the Biology department staff is able to withdraw a student from a course. Students who simply stop coming to class but do not withdraw **will receive a grade** for the class that is based on (1) whatever work they did before they stopped attending and (2) the 0's they receive for all work not done after they stopped attending. In almost all cases this works out to be a grade on “F”.

The final deadline for withdrawing from a class this semester is November 13, 2009.

Students withdrawing at that time will not receive any refunds. Withdrawals prior to that date may be eligible for refunds. Check the Schedule of Classes for a detailed listing of deadlines for refunds.

Incompletes: The grade of “I” (Incomplete) will not be allowed except in circumstances clearly beyond the control of either the student or the instructor. A grade of “I” will **not** be given because of poor performance in the course.

Tutoring: A tutor is provided by the Biology Department for students who feel they need additional help. Contact information for the tutor and tutoring hours will be posted as soon as that information is available.

General information about Blackboard:

1. To view Acrobat (.pdf) files posted on Blackboard, you will need to download the free Adobe Acrobat reader at <http://www.adobe.com/products/acrobat/readstep2.html>.
2. If you are having trouble see the Student Guide at: http://www.neiu.edu/~etlt/download/student_online_guide.pdf
3. Computer Services says that Internet Explorer works better with Blackboard than other browsers, so if you begin to have problems, try downloading Internet Explorer.
4. *AOL users:* You can use AOL to connect to the internet, but don't use the AOL browser with Blackboard. After you connect to the internet with AOL, open Internet Explorer and go to <http://neiu.blackboard.com> to access Blackboard.

Course Outline

Wk	Ch	Lecture Topic	Assignment Due by Class Time	Lab Topic	Lab Work Due by Lab Time	Special Assignment Due by Lab Time
08/31	1, 2	Characteristics & Chemistry of life <i>Requirements for life, chemistry of water, and macromolecules</i>	Assignment 1	Scientific method & Graphing <i>Analyze anecdotes, case studies, and research studies</i>	--	
09/07*	3	Macromolecules of Life <i>More about macromolecules, Cell structure and function, Types of cells</i>	Assignment 2	Microscope Fun! <i>Bring in items from home to examine with light microscopes</i>	Scientific Method Write-Up	
09/14	4, 5	Cell Structure, Energy and Enzymes <i>Cell structure and function, Thermodynamics</i>	Assignment 3	Lecture or Lab Catch Up <i>Microscope fun catch up for Monday lab or lecture catch up</i>	Microscope Lab Write-Up	
09/21	5	Energy and Enzymes <i>Endothermic, Exothermic, Active transport, How enzymes make cells work</i>	Assignment 4	Potato Lab and Osmosis <i>Response of a biological organism (potato) to saline solutions</i>	--	Macro-Molecule Quiz on Blackboard (open notes)
09/28	--	Exam 1	--	In Class Enzyme Lab <i>Effect of pH on the rate of an enzymatic reaction</i>	Potato Lab Write-Up	Macro-Molecules II Pre-Lab
10/05	6, 7	Photosynthesis and Cellular Respiration <i>Energy flow and cycling between producers and consumers.</i>	Assignment 5	Ecology Lab <i>Use a dichotomous key to identify local trees</i>	In Class Enzyme Lab Write-Up	
10/12	22	Digestion <i>Food into energy and macromolecules of life</i>	Assignment 6	Macromolecules-I <i>determine which reagents detect macromolecule s/interpret results</i>	Ecology Lab Write-Up	Macro-Molecule Quiz on Blackboard (open notes)
10/19	24	Circulatory System <i>Arteries, veins, capillaries, the heart, the lungs and their connections</i>	Assignment 7	Macromolecules-II <i>Test food items and design experiments to test food items from home</i>	Macro molecules I Lab Write-Up	Macro-Molecules II Pre-Lab due before class
10/26	--	Exam 2	--	Fetal Pig Dissection-1 <i>Abdominal Cavity, Digestive System, Urinary System</i>	Macro molecules I I Lab Write-Up	Fetal Pig I Quiz <u>before</u> lab begins
11/02	27 or 25	Major Control Systems (Immune OR Nervous OR Endocrine System- Instructor's choice)	Assignment 8	Fetal Pig Dissection-2 <i>Thoracic Cavity, Neck, Circulatory, Reproductive System</i>	--	Fetal Pig II Quiz <u>before</u> lab begins
11/09	8, 10	Cellular basis for Inheritance <i>DNA, RNA, protein, Information is passed through gametes</i>	Assignment 9	Fetal Pig Practical Exam (50 pts)	--	Practical Pig Exam During Lab time
11/16	9	Genetics <i>Meiosis / non-disjunction, Dominance, Co-Dominance, sex-linkage, Punnett Squares, Pedigrees</i>	Assignment 10	Kitchen DNA Lab <i>Extract DNA from cells for examination using everyday tools</i>	--	
11/23*	--	Exam 3	--	Pedigree Lab <i>Use Pedigrees to explain inheritance patterns (at home for Thurs labs)</i>	Kitchen DNA Write-Up	
11/30	13	Natural Selection <i>The process and tenets of natural selection, How natural selection and evolution change populations</i>	Assignment 11	Natural selection I in lab OR Field Museum Trip <i>Students will use beans to observe natural selection</i>	Pedigree Lab Write-Up	
12/07	14	Evolution <i>Role of diversity, History of life, What was needed for life to begin and continue?</i>	Assignment 12	Natural selection II in lab OR Field Museum Trip	--	
12/14	--	Final Exam 12/6 (Sat Classes), 12/9, 12/10, 12/11	--	--	Nat Selection OR Field Museum	Field Museum Write up (optional)

*Holidays (No Class): 9/7, 11/26-27