

Biol 106/116 - Foundations of Biology II

Summer 2014

Instructor: Dr. Jennifer Fox
Regents 373
jaf243@georgetown.edu
Laboratory:

Lecture: MTRF 8:15-10:15
Regents 239
Laboratory: MTRF 10:30-1:10
Regents 361
Office Hours:
or by appointment

The details for 2015 may change slightly but the course will be very similar to previous years.

Course Goals and Objectives

In the course, you will become acquainted with the process of evolution, the astonishing diversity of living organisms that has evolved through this process, and the complex ecological interactions that occur among species. In addition to introducing basic concepts of evolution and ecology, this course promotes an understanding of science as a process and provides opportunities to practice writing clearly and concisely about biology.

Course Expectations

I expect you to come to each class prepared, to treat all members of the class with respect, and to turn assignments in on time. You can expect the same from me in return.

Lectures

Attendance at all lectures is important and expected. You are responsible for all information presented in lectures, including any announcements and course content not found in your textbook. Your active participation is expected. Participation entails coming to class prepared, listening actively, and speaking up when required. You may be asked to take a specific stance in a class debate, work in small groups, answer "iClicker" questions, or make a brief presentation to the class. Of course participation is not possible if you are not here, so you must come to every class on time.

Readings

Our text is Morris et al.'s *Biology: How Life Works* and Pechenik's *A Short Guide to Writing about Biology*, any edition. Please take advantage of the additional materials included with the text and online (see link on course Blackboard site). Additional readings will be distributed in class, available on the course web site, or on reserve at the Blommer Science Library. Assigned readings should be completed by the date listed on the syllabus.

The lectures and readings for this course are designed to supplement, not repeat, each other. We will talk about topics in class that are not covered explicitly in the readings, and you will read about things that we will not discuss in much detail. I often use different examples than the text in order to give you an additional perspective or to highlight different aspects of a subject. Therefore, to do well in this course you must attend all lectures *and* keep up with the readings.

Quizzes

In order for you to assess how well you are keeping up with the material, we will have several quizzes. These quizzes are non-cumulative and cover material from previous lectures, readings, and assignments as well as readings assigned for the current day. All quizzes will be given at the start of class. Your lowest quiz score will be dropped. It is not possible to make up a missed quiz; be sure to account for traffic or Metro delays when planning your trip to campus each day.

Laboratory

If you are enrolled in Biol 116 laboratory, your attendance and active involvement in all labs is required. It is not possible to make up a missed lab. You will receive more detailed information about the expectations for this portion of the class in your lab section. Please note that two or more unexcused absences from lab will result in failing the entire course.

Learning Goals

The Department of Biology at Georgetown has developed a set of learning goals for all Biology majors. These goals both guide the organization of the curriculum in our department and also serve to explicitly communicate to students the knowledge and intellectual skills that we value as a foundation to your education as biologists. We will address all of these goals in both the lecture and laboratory portions of Foundations in Biology II, with special emphasis on the goals below in bold. You can access a more detailed description of the learning goals on the Department webpage (biology.georgetown.edu).

Insight into the Process and Product of Science

These learning goals emphasize our belief that a biology education should enable students to make creative and careful use of their knowledge. Only then will they be scientists.

1. Integration of new knowledge into existing intellectual frameworks
2. **Engagement with scientific inquiry**
3. **Representing and interpreting data in quantitative and statistically meaningful forms**
4. Communicating scientific understanding in oral and written forms
5. **Appreciating the epistemology of science**

Fundamental Biological Concepts

A major theme that rises above the categories of fundamental biological concepts that we describe below is that all of biology operates under the constraints of the mechanisms of evolution. It is therefore **essential that Biology students have a strong foundational understanding of the theories, evidence, and mechanism of evolution.**

6. Organization of molecular, cellular, organismal and ecological systems
7. **Evolution as a framework for understanding biological systems**
8. The flow of biological information
9. **Flow of energy and matter in biological systems**
10. **Interdependence and interactions within biological systems and their emergent properties**

Evaluation and Grading

Your performance in these courses will be evaluated based on the following percentages.

Biol 106 (lecture, 3 credits):

Mid-term exams x 3	54%
Final exam	32
Quizzes	10
In-class work	4

Biol 116 (lab, 2 credits):

Lab exams x 3	30%
Assignments and papers	70

Dates and Deadlines

As Ben Franklin almost said, nothing is certain but death, taxes, and deadlines. In this course deadlines are imposed not only to prevent you from falling behind, but also to ensure that your work can be returned to you in a timely manner. Exceptions will be made in cases of serious illness or family emergency and reasonable allowances will be made to accommodate other conflicts if they are brought to my attention *before* the deadline. A late assignment will lose 10% of its value every 24 hours and will not be accepted after 5 days (counting days that class does not meet, including weekends).

There will no make-up exams or quizzes, regardless of circumstances. To be excused from an exam due to a *documented* family emergency or illness, you must notify me *before* the exam and provide appropriate documentation. If you miss an exam for any other reason or fail to notify me in advance, you will receive a zero.

Absences

Attendance and participation at all classes is expected, and multiple unexcused absences will negatively impact your grade. Absences due to approved events, such as religious holidays or University-sanctioned activities, should be discussed with me beforehand so that we can make suitable arrangements. Routine or excessive tardiness will be treated as absences. ***Regardless of your reason for missing a class, YOU are responsible for finding out what you missed, getting copies of anything distributed in class, and turning in any work collected.***

Better Living Through Silicon

It is easy to take computers and all they do for us for granted – until they fail. It is your responsibility to keep your computer in good working order and to back up your files regularly. If your own computer is not working, there are public computers in most buildings on campus. I do not accept excuses for late or missing work resulting from lost files, computer crashes, printers without ink, or inability to access Blackboard or other Internet resources.

The Blackboard Web site for this course can be accessed at <http://campus.georgetown.edu> using your NetID and password. You will find a copy of this syllabus, announcements pertaining to the course, lecture outlines and slides, lab handouts, and any additional readings, handouts or slide shows used in lecture or lab.

If I need to contact you outside of class, I will send an e-mail via Blackboard to your Hoyamail account (@georgetown.edu). *If you check a different account, please set up your Hoyamail account to automatically forward mail to that address.*

I check my email regularly but not constantly, and infrequently in the evening or on weekends. If you can't wait at least 24 hours for me to read and respond to a message, it is better to call my office or come to my office in person.

Cell phones and other mobile devices should be turned off and put away and no text messages sent or received during class.

Academic Integrity

Copying from published sources or from classmates, failing to give full credit for quotations or ideas, or attempting to pass any work done by others as your own are examples of plagiarism. Plagiarism is a violation of the Georgetown University Honor System. Moreover, it is simply wrong, and undermines the mutual trust on which an academic community must be based. Plagiarism will not be tolerated. If you are ever unsure about whether you should credit a source, err on the side of over-citing and ask for guidance.

Laboratory Safety

Most accidents can be avoided by simply being aware of what is going on around you. Pay attention to where reagents are on the bench, particularly hazardous chemicals. Know what the other members of your group are doing and where other people are moving throughout the room. Ask if you are unsure how to do something or handle equipment. You may not eat or drink in the lab.

A Special Note About Summer School

Our summer course will be an intense experience as we cover the same material and concepts as a semester-long course in about a third of the time. During the summer session you have the opportunity to immerse yourself in the topic at hand and to focus on this one course in a way that is not possible during a typical semester, and this can provide a rewarding and productive experience.

However, you must recognize that there is no time to procrastinate. Something important (an exam, a laboratory assignment, a quiz) occurs every day. Because of the cumulative nature of the material, you must get your questions answered as soon as possible, before we move on to new topics that build on the old. The best strategy is to establish a routine that includes time set aside for biology every single day. Work hard and keep up, and get help as soon as you need it, and you'll do well.

Extra Help

The best way to learn is to teach others. I strongly encourage you to take advantage of the collective wisdom of your classmates – let your discussions spill over into time outside of formal class meetings, work together to discuss readings and prepare for class, form informal study groups. *The production of all assignments, however, should be your own work.*

Requests for academic accommodations must be formally filed with the Academic Resource Center (ARC). It is your responsibility to self-identify with the ARC. To schedule an appointment, stop by Leavey Center Suite 335 or call (202) 687-8354. Note that there are no retroactive accommodations.

I am available during my office hours and am happy to make appointments in order to discuss biology, course specifics, or other matters. If you are having difficulty with the course, please come and see me – the sooner the better – so that we can address the issues before it is too late. If you are enjoying the course, stop by to discuss topics we're covering or things we aren't getting to. I am interested in your questions, comments, and suggestions about this course.

I look forward to spending the semester exploring the diversity of life with you!

Course Schedule

The details for 2015 may change slightly but the course will be very similar to previous years.

Date	Lecture Topic	Lecture Reading	Lab Exercise	Lab Assignments Due
M June 2	Administrivia; Intro to Evolution	Chs. 1 (esp. 1.1, 1.4-1.6), Case 4	Introductions	
T June 3	Heredity & Variation	Chs. 15, 18, 21.1-21.2	Experimental Design: Termites	
R June 5	Evolutionary Processes [Q]	Ch. 21	Hypothesis Testing: t-test and χ^2	
F June 6	Hardy-Weinberg Model [Q]	Chs. 16, 21.3, Freeman Ch. 25.1	Microbial Diversity I	Micro proposal (5 points)
M June 9	More Evolutionary Processes; Exam 1	Chs. 16, 21.3	Evolutionary Forces	
T June 10	Natural Selection and Adaptation [Q]	Ch. 21.4	Microbial Diversity II	Termite assignment (15) Evol. Forces assignment (10)
R June 12	Speciation [Q]	Ch. 22	Phylogenies	
F June 13	Phylogenies & Systematics	Ch. 23	Lab Exam 1 (20 points)	Phylogeny assignment (10)
M June 16	Origins of Life; Exam 2	Ch. 23.3-23.4, Case 1	Microbial Diversity III	Micro Objective 1 assignment (5) [in lab]
T June 17	Prokaryotes; “Protists”	Chs. 26, 27, Case 5	Field Trip: Botanic Gardens	
R June 19	Multicellularity [Q]	Ch. 28	Spring Break! No lab	Botanic Gardens assignment (11)
F June 20	Plants and Fungi [Q]	Chs. 30.1-30.2, 33, 34	Field Trip: Natural History Museum	
M June 23	Animals; Exam 3	Ch. 44	Lab Exam 2 (20)	
T June 24	Photosynthesis Intro to Ecology [Q]	Chs. 8, 29.2 Case 8	Hypothesis Testing: ANOVA	NMNH assignment (12) Micro Objective 2 assignment (25)
R June 26	Population Ecology [Q]	Ch. 46	Field Trip: National Zoo	ANOVA (15)
F June 27	Community Ecology	Ch. 47.1-47.4, Case 7	Forest Ecology	Zoo assignment (12)
M June 30	Ecosystems	Chs. 47.5-47.6, 25	Keystone Predator	Forest assignment (10) Keystone assignment (10) [in lab]
T July 1	Conservation Biology and Wrap-up [Q]	Ch. 48	Lab Exam 3 (20)	
R July 3	Final Exam		No lab	
F July 4	July 4; no classes		July 4; no classes	

[Q] = quiz at start of class

This schedule is tentative and subject to change (with notice!)

Readings from: Morris et al. 2013. *Biology: How Life Works*. W.H. Freeman and Company, New York, NY.