

BIOLOGY 163
THE CELLULAR BASIS OF LIFE
Fall, 2009 – Section A

Lectures:

Paul G. Greenwood
Office: Arey 114 Lab: Arey 113A
Ext: 5732 e-mail: pggreenw@colby.edu

A schedule is posted on my door indicating what times I am teaching classes and labs. I am usually in my office or lab at other times and you are welcome to stop in whenever it is convenient for you, but there may be times when I may not be able to accommodate you. The best way to see me is to make an appointment so you are guaranteed my undivided attention. Please come and talk to me if you have any questions regarding the material in this course, or concerns about your (or my!) performance.

Laboratory instructors:

Scott Guay (Olin 202, Ext. 5733, slguay) – Lab Coordinator for BI163L
Tina Beachy (Olin 302, Ext. 5725, tmbeachy)
Lindsey Colby (Olin 304, Ext. 5727, lwcolby)
Alina Corcoran (Arey 206, Ext.????, acorcora)
Sarah Gibbs (Olin 305, x5747, scgibbs)

Course Objectives:

The objective of BI 163 is for the students to develop an understanding of the cell as the fundamental structural unit of all living organisms. We will discuss aspects of evolutionary biology, cell biology, molecular biology, genetics and other fields. My intent is to help you develop the intellectual tools that allow you to be able to ask and answer interesting biological questions, not to make you memorize a bunch of facts you can look up in the book anyway. The objectives of the laboratory are to allow you to design and conduct experiments, to analyze and present data, and to write accurate scientific papers.

COURSE REQUIREMENTS

Readings: The text for the course is: Freeman, Scott. 2008. Biological Science, 3rd ed. Prentice Hall, Upper Saddle River, NJ. 1262 pp.

Readings from the text will supplement the lectures and discussions.

Class sessions: M, W, F at 9:00 - Class periods will consist of lectures and discussion roughly following the “Order of Lecture Topics” listed below. For the exams you will be responsible for all material covered in class and laboratory. If you have to miss a class

period, be sure to find out what we covered by getting notes from another student. *Do not attend other sections of BI163!*

Labs: The laboratories will give you personal experience with exploring the principles of biology discussed in class and allow you to become familiar with some of the experimental techniques used to address current biological problems. You will write several scientific papers and do various exercises over the course of the semester.

Because of the class size, the laboratory will be multi-sectioned. The number of people who can be accommodated in a given section is limited. Please attend your assigned section. If forced by circumstance to attend another section, **you must get the permission of both laboratory instructors involved.**

The course web site is: <http://www.colby.edu/biology/BI163/index.html>

Attendance and Participation: Attendance at all class meetings is mandatory. Unexcused absences will result in a lowering of your overall grade (at my discretion). Unexcused absence from laboratory will result in you being dropped from the course. *The instructors of the course and the laboratory are the only ones who determine what constitutes an excused absence.*

A part of your grade will be determined by your participation in the “lecture” portion of the course. You will have a number of opportunities to participate, both individually and as a member of small “study groups” to which you may be assigned.

Exams: There will be two mid-term exams during the semester and one final exam during exam week. These exams will be closed book and will be individual efforts - no books or notes may be used, and no assistance of any kind may be acquired from other students during the exam.

Exam I - Wednesday, 7 October (6:00 to 7:30 PM)

Exam II - Wednesday 11 November (6:00 to 7:30 PM)

Final Exam - (exam period currently is #4 – day and time will be set by the Registrar)

This will be a comprehensive exam over **all** material covered during the semester.

Assessment and Grade:

Your success in meeting the objectives of this course will be assessed in several ways. Your ability to solve problems will be examined using group problem sets and in-class objective assessments. Examinations will be used to assess both your problem-solving abilities and your understanding of the cell and other course topics. Your experimental design skills and data analysis skills will be assessed on lecture examinations and in laboratory homework sets. Your development of good paper-writing skills will be assessed by laboratory homework assignments and by writing scientific papers.

Each of these assessments will contribute to your overall semester grade as outlined below:

Lecture (75%):

Problems and Participation – 12%

Exam I – 16%

Exam II – 20%

Final Exam – 27%

Laboratory (25%):

(Specific grade breakdown to be provided in lab)

Tentative Order of Lecture Topics

(this is just the order; how long we spend on each section is unknown at this time)

<u>Topic</u>	<u>Reading (from Freeman)</u>
Introduction to cell structure and function, the cell theory, evolution, and the tree of life	Chapter 1
Biomolecules	Chapter 2, 3, 4, 5
Membranes	Chapter 6
DNA structure, replication, mutation, and repair	Chapter 14
Mitosis and the cell cycle	Chapter 11
The genetic code, transcription and translation	Chapter 15, 16
Processing in the ER and Golgi; cellular movements	Chapter 7
Glycolysis, fermentation, and respiration	Chapter 9
Photosynthesis	Chapter 10
Bacteria and Archaea	Chapter 28
Protists and the evolution of eukaryotes	Chapter 29
Viruses	Chapter 35

First Outline – You will receive a separate outline for each part of the course with a detailed reading assignment

Biology 163A - 2009

INTRODUCTION, CELL THEORY, EVOLUTION AND THE TREE OF LIFE

- I. Introduction to the Course
- II. Cell Structure and the Cell Theory: **Chapter 1: pp. 2-4.**
 - A. Cell structure overview – Disorders of cellular structures
 - B. Development of the two major tenets of the cell theory – pattern and process
- III. Evolution by Natural Selection : **Chapter 1: pp. 4-6.**
 - A. Pattern and process
 - B. Natural selection as differential reproduction
- IV. The Tree of Life: **Chapter 1: pp. 6-10.**
 - A. Taxonomic classification
 - B. Whittaker's five kingdom system
 - C. Woese's three domain system