

Biology 121, Summer 1 2009
MTWTh* 10:30-12:20 SCI 106

*plus Friday, June 26, minus Thursday, July 2. Final Friday July 10, 11AM.

Instructor: Chris Hill Office: Science 127; chill@coastal.edu; 349-2567
<http://ww2.coastal.edu/chill/chill.htm>

Office hours: I will be available before and after class each day. Drop by any time other time as well; my door is usually open. If you can't catch me in person, leave a note, drop me an e-mail or call and we'll find a time we can meet.

Text: Campbell, N.A. and J.B. Reece (2007) *Biology, 8th ed.*

The nature of this course: Biology 121 is the first part of a two semester introductory series, designed for science majors. We'll cover cells, genetics, biochemistry, and a bit about how science works.

Student Learning Outcomes:

Upon completion of the course you should be able to demonstrate an understanding of basic concepts and processes in biology, including:

- *The process of science*: You should be able to...
 - ✓ ... describe science as a way of knowing, and how science differs from other ways of knowing.
 - ✓ ... outline the scientific method, including providing definitions and examples of hypotheses, experimental tests, and controls

- *The chemistry of life*: You should be able to...
 - ✓ ...define and give examples of elements, compounds, and subatomic particles.
 - ✓ ...describe and differentiate different types of chemical bonds.
 - ✓ ...describe the importance of carbon and of water to life on earth.
 - ✓ ...when given a simple molecular formula, suggest a structure for the molecule.
 - ✓ ...describe what makes a molecule polar, how polar compounds behave, and how polar molecules influence living things.
 - ✓ ...recognize the chemical structure & describe the function of biological macromolecules.

- *The cell*: You should be able to...
 - ✓ ...describe basic cell structure and function.
 - ✓ ...sketch the structure of cellular membranes, and list functions for them.
 - ✓ ...describe in detail the processes of cellular respiration and photosynthesis.
 - ✓ ...sketch a typical cell cycle and common variations.

- *Genetics*: You should be able to...
 - ✓ ...provide definitions for (and use correctly) the key vocabulary to describe inheritance
 - ✓ ...describe and sketch the process of meiosis
 - ✓ ...correctly interpret pedigrees and predict the outcomes of Mendelian crosses. Mendelian inheritance
 - ✓ ...show how inheritance is affected by the physical structure of chromosomes
 - ✓ ...describe the molecular basis of inheritance – how DNA and RNA influence protein structure, and how protein structure affects phenotype

Assessment of learning outcomes:

- Each of the learning outcomes will be assessed by a combination of quizzes and exams.

Exams, makeup exams, and the comprehensive final: There will be four hour exams, worth 100 points each, and a semicomprehensive final, also worth 100 points. You get to drop your lowest hour exam grade, but you do not get to drop the final. Exams will be given from 10:30-11:20 on Mondays. At 11:30 each Monday we will start new material.

Quizzes: Some quizzes will be given in paper form in class, and some may be given online through Blackboard/WebCT. In-class quizzes will be unannounced. Quiz scores all together will count as much as one exam (100 pts.). Quiz questions will be drawn from the same pool as test questions. These quizzes serve two purposes – they encourage you to keep abreast of the material, and they give you a preview of the type of questions you will see on tests. There are no makeups on quizzes. If I hand out a quiz at the start of class, and you are late, you do not get to take the quiz. Occasionally I will give a homework problem instead of a quiz.

Attendance Policy: Test material will be drawn from both lectures and readings, but *mostly from lectures*. Consistent attendance is important to your doing well in the course, and you should strive to miss no classes during the semester. If you are absent on the day of an quiz, or when a worksheet is due, you get no credit for it (see above under quizzes). If you are going to be absent on the day of an exam for a documented, university-recognized reason (see the course catalog), let me know promptly, well in advance if possible, and I will arrange a makeup. Absences from exams for other than university-recognized reasons, or without documentation, will result in a zero for that exam.

<u>Grading Scale:</u>		77-80%.....C+
<u>Percentage</u>	<u>Grade</u>	70-77%.....C
>90%.....A		67-70%.....D+
87-90%.....B+		60-67%.....D
80-87%.....B		59% or below.....F

Note that biology majors need to earn a C or better to get credit for bio 121.

SEQUENCE OF TOPICS	CHAPTER IN TEXT
Introduction to the course. Scientific method. Darwin.	1
Life = Chemistry! Yup, chemistry.	2
Water	3
Carbon Chemistry	4
Biological Macromolecules, in part	5
Monday, June 15: Hour Exam #1	
Biological Macromolecules, continued	5
All living things are constructed of cells. What's in a cell?	6
Membranes organize and control cell functions.	7
Life is Energy, and Enzymes make everything work	8
Monday, June 22: Hour Exam #2	
Generating and managing energy in cells – cellular respiration; the Krebs cycle	9
We all run on solar energy, and we owe it all to plants	10
Cell growth and division	12
Sexual reproduction at the cellular level	13
Monday, June 29: Hour Exam #3	
Living things pass information to their offspring. Peas.	13
More Mendelian Genetics, and Beyond Mendel	14
How chromosomes are inherited (and what does that have to do with genes?)	15
The universal language of living things: DNA contains the message	16
Passing it on – how DNA is copied	16
From Gene to Protein	17
Monday, July 6: Hour Exam #4	
Birds do it, bees do it, even bacteria and fleas do it. But what happens then?	18,19
Basics of DNA technology : Cloning your own (not!)	20
Friday, June 10: Semi-cumulative FINAL EXAM	

Important note: The order of topics will be as above, but exactly which topics are covered for each exam may vary from the schedule. For each hour exam, you will be responsible for all material covered in class since the last hour exam.