Biology 1050: General Biology I (Spring 2012)

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CRN: 23614; **Section**: 006

Texts & Materials: All required and recommended materials are available in the campus bookstore. You may be able to find the same books for better prices by using online sources.

1. ***Campbell Biology with Mastering Biology***, 9th edition by Campbell and Reece, 2011, ISBN 0321558146

- I selected this text as the primary book for this course because it is comprehensive, relatively easy to read, has excellent figures, and is a standard in the field. It also comes in a variety of formats.
- Text is available in several formats: Hardbound, paperback, loose-leaf three-hole punched, and as an e-book.
- The 8th edition is probably fine to use, but you may wish to compare the 8th and 9th editions.
- You will have required assignments through the Mastering Biology website, so you must also purchase this module. If you buy a used book elsewhere, you can purchase access to Mastering Biology separately.
- You will use this book in General Biology 2, as well, so you will get a good return on your investment.
- The Mastering Biology will provide you tools that will assist your success and learning. Plus, you'll earn points for completing homework assignments!

2. ***Dictionary of Word Roots and Combining Forms*** by Borror, 1988, ISBN 0874840538 (optional)

- This little book is optional, but it's really cheap.
- This book can help you learn to make sense of the language that biologists use. If you keep it handy, you will find it to be a valuable reference in this class and in others throughout your career. Making the language of biology your own is one of the biggest challenges you will face in this course.

3. The **i>Clicker** is **<u>required</u>** for this course. We are still using the i>clicker version 1.

- Using clickers in class helps to make lecture more interactive. It keeps you awake, allows you to earn participation points, and it helps me to gauge how well the class understands my presentation.
- <u>Register your iClicker at www.iclicker.com right away! Be sure to enter your Blackboard username (e.g. this is the same as your email login, for example, in my case it would be "lhamilton") as the Student ID.</u>
- You *can* purchase a used iClicker and re-register it under your own name.

4. You will need to use the **Blackboard course site** for this class.

- Go to http://my.csustan.edu and click on the "Blackboard" link on the left side of the page.
- Login and enter the Biology 1050-006 course site to find course content.
- There are many student computer labs available on campus; *you do not need to own a computer*.

COURSE DESCRIPTION AND OBJECTIVES

Purpose of Course

The purpose of the introductory series is twofold: (1) to introduce students to the breadth of the biological sciences and (2) to help beginning biology majors master the fundamental facts and theories needed for success in subsequent courses.

This course is the first in the two-course series and will focus on cellular and molecular biology, genetics, and microevolution. Learning objectives and GE Goals will be met through a combination of Lecture (LE) & Lab (LA) experiences.

Learning Objectives

Students will be able to describe, identify, and/or explain:

- ☐ The importance of membranes to cells. (LE, LA)
- ☐ The flow of information within cells, between cells, and between the environment and cells. (LE)
- ☐ The flow of energy within cells, between cells, and between the environment and cells. (LE, LA)
- ☐ The principles of homeostasis and processes that maintain cell functions. (LE, LA)

- ☐ The chemical principles of macromolecules and formation of cellular structure and with cellular functions. (LE)
- ☐ The relation between cell structure and function. (LE, LA)
- ☐ The dynamics of cellular reproduction in reference to the cell cycle, growth and apoptosis. (LE, LA)
- ☐ How the cell integrates into the hierarchical organization of living systems. (LE)
- ☐ The main ways cells acquire, transport, process, use, and transfer nutrients. (LE, LA)
- ☐ The molecular biology techniques used to understand the cell. (LE, LA)

Students will:

- ☐ Value the process of scientific inquiry as a means of understanding the natural world. (LE, LA)
- ☐ Develop an appreciation for biology and its relevance to broader societal issues. (LE, LA)
- ☐ Identify with and participate as a member of the scientific community. (LE, LA)
- ☐ Conduct themselves and their activities in a professional manner. (LE, LA)

General Education Goals

1. To provide an overview of the principles, methodologies, and perspectives of biology. Concepts include: cell theory, evolution, genetics, biochemistry, and the nature of science. (LE, LA)
2. To development an understanding of fundamental concepts to allow effective oral and written communication on biological issues. Specifically, through laboratory reports and presentations students will demonstrate the ability to clearly communicate in a scientific format. (LE, LA)
3. To provide working background to analyze and critically evaluate biological issues and facilitate continuous inquiry and life-long learning in scientific and non-scientific settings. (LE, LA)
4. To provide the framework to understand, examine critically and use information from various reliable sources to answer future biological questions. (LE)
5. To understand the relationships between the fields of biology, chemistry, physics, geology, and other sciences with an emphasis on how these fields are interrelated. (LE)
6. To develop more informed views of the connections of biology with respect to current and future issues of ethical judgment and social responsibility. (LE, LA)

Course Requirements

Prerequisite: Grade of A or B in high school biology, satisfactory score on biology qualifying examination, or BIOL 1010.

Assessment Methods, Grades, and Grading

The most practical assessment measure for content-heavy courses is the objective exam. Most of your grade for the lecture portion of the course will be based on lecture exams. Participation points will be available daily in lecture, through participation with your iClicker. Questions will include pre-test quiz questions, comprehension questions, and summary/review questions. Thus, you have the opportunity to earn participation points through the entire class period. There will be opportunities to gain a few points of extra credit in lecture and lab. Lab points are added to lecture points to calculate your total grade in the course. I do not use a curve. This course is graded plus/minus, and there is a CR/NC (Credit/No Credit) option.

Any homework or extra credit assignment must be turned in on the day and time it is due. Under normal circumstances no extra credit will be accepted after the due date. Your end of the semester homework score will normalize each individual graded homework assignment so that each overall homework assignment will constitute 10 points. **No makeup assignments will be given, but students can drop their 2 lowest homework scores**.

<u>The last day to apply for the CR/NC grading option is Friday, May 4th.</u> To do so you must contact me in person and have your form filled out and ready for me to sign. It is your responsibility to turn this form in to Enrollment Services. I will follow the grading option indicated on the final grade sheet supplied by Enrollment Services. Consult with your advisor before making your decision. Once you have selected the CR/NC option you cannot opt for a grade. **No grades will be changed once they have been submitted to the registrar**. <u>The last day to drop the class is Wednesday, February 22nd</u>.

Expectations of Students

- **Engage the course material** through participation in class, reading the text, and thinking about biology outside of class.
- **Be respectful of others** by arriving on time, giving your attention to whoever is presenting, listening to the ideas of your classmates, turning off cell phones, and generally being polite. This also means no text-messaging (yes, the person at the front of the room *can* tell what you are doing) and no internet surfing (it's distracting to those sitting around you).
- **Observe lab safety** and cleanliness procedures. All lab materials must remain in lab at all times.
- Students are expected to **take exams** during the scheduled dates and times. Requests for early exams must be submitted in writing to the instructor at least one week prior to the scheduled exam. No makeup exams will be given after an exam has

been returned to the class; any unexcused missed exams without a proper written and verifiable excuse will be recorded as a zero. If you miss an exam for a legitimate emergency it is your responsibility to notify the instructor immediately. If provided, makeup exams will be different from regular exams, may include essay and short answer questions, and only will be allowed for a valid documented emergency absence. These must be completed as soon as possible and no later than within one week of the originally scheduled day of the exam. It is the responsibility of the student to contact the instructor and make arrangements to take the test within the allowed time.

- **Maintain your academic integrity**. *Your integrity is your most valuable asset as a student* and in your future career as an educated person. In line with this, it is the policy of the Department of Biological Sciences that anyone caught *cheating* or *plagiarizing* will receive a grade of F for the course. I reserve the right to request any student suspected of cheating to take a second, different exam on the material. Protect yourself by making your integrity obvious.

Expectations of the Instructor

- Same as those for students, in terms of engagement in the course, respect for participants, and observation of lab safety procedures. *I do my best to protect your privacy and to maintain an environment in which you can learn.*
- Be **open to feedback** on the course and be flexible in order to make appropriate changes to meet student needs.
- Be **fair and consistent in assessment** of student learning.
- Be **available to students** outside of class time to answer questions and discuss class material.

Students with Disabilities: If you are a student with a documented disability, please meet with me privately as soon as possible so we can arrange the accommodations that will foster your success in this course.

How you Earn your Grade in Lecture

As I complete grading for each assignment or exam, you will be able to check your score on Blackboard.
You have one week following return of any exam or assignment to meet with me to work out any reasonable changes in grading.

Mastering Biology Assignments

Mastering Biology provides a wealth of tools for students and instructors. In each chapter, you can explore information about the topics, watch videos, quiz yourself, and work through problems.

I will post weekly assignments to motivate you to engage with the material. Assignments will be graded for completeness and correct answers. Together, they will be worth a total of 180 points over the course of the semester. My hope is that the assignments will allow you to earn points while interacting with the material to really master the topics we will cover this semester. If you did not purchase Mastering Biology bundled with your textbook, then you will need to purchase the site access separately.

Exams: There will be four (4) exams during the semester. The final exam will be on Thursday, May 17th from 8:30a.m. – 10:30 a.m. in N101. Exams will consist of 40 questions to be answered on a Scantron (bring a Scantron form 882-E and pencil). There will also be one page (front and back) of short answer/identify a picture from the text/label-a-process questions. Questions will cover material from lecture. Scantron questions will be valued at 80 points on each exam and short answer at 20 points. If you are late to an exam, then you will have less time to complete the exam so plan your schedule accordingly. Traffic and/or car problems are not acceptable excuses for being late. During exams, cell phones must be turned off and hats must be removed. If your cell phone rings during an exam or you arrive more than 15 minutes late without a proper written and verifiable excuse, five (5) points will be deducted from your score. Students who arrive after the first exam of the day has been turned in will not be allowed to take the exam. No food, drinks, or headphones are allowed during the exam period. You must not leave the room during an exam/quiz without the instructor's permission.

Note: Although the Scantron machine is generally accurate, it sometimes makes mistakes, particularly when you change an answer and do not completely erase the other choice. In order to verify these mistakes you also must write the correct answer in the space provided on the question sheet. Challenges to the machine's accuracy will not be accepted if you did not do so. You have until the next class period, after the Scantron is returned, to challenge its accuracy.

The instructor reserves the right to give unannounced quizzes if it becomes apparent that students are not keeping up with the material and/or there are an unacceptable number of absences. If you happen to be absent that day or you fail to follow instructions, you will receive a grade of 0 for that quiz.

Audio\Video Recording: Recording of lectures is not permitted without written consent from your instructor.

Tips for learning the material

In my experience, many bright students are simply not challenged during high school. As a result, these smart and capable people haven't had the opportunity to develop the study skills needed for success in the university. Don't let the first exam catch you by

surprise! This course is content-heavy, and you will **not be able to cram** with much success for the exams. **Make your study time a daily habit.**

- Skim the whole chapter before you come to class. Carefully read and interpret the figures and tables and carefully read each vocabulary term.
- Watch any assigned videos before coming to class. These will give you a preview of the day's material.
- Take notes in class based on what you hear. Do not spend the class period copying every word off my slides. These same words can be found in your text.
- After class review your notes. Go back and read the textbook to fill in gaps in your understanding. **Some students have been very successful by copying out their notes onto flashcards for study.**
- After class, write 7-10 exam questions for the material. This will give you a study sheet for before the exam.
- When you study, don't fool yourself! When you page through the textbook, everything will look familiar. This doesn't mean that you personally own the knowledge yourself. Make it yours! After each class day, without looking at your notes or the book, write down a list of the topics and subtopics covered. Write down key words and their definitions. Make your best sketch of the figures/illustrations presented. After this, open your text and see how well you did. The parts you missed entirely are the parts you need most to study, the parts you partially remembered also need some attention. The parts you know perfectly are part of your own knowledge set.

Participation

You will use your clicker to respond to in-class questions. This helps me gauge your level of comprehension and will help me with the pacing of the material. It also allows me to reward you for being dedicated in your lecture attendance. I know things come up, and you might miss a day or two of class; don't worry, *it will be safe to miss three days without penalty*. Additionally, you can earn bonus participation points for attendance on group presentation days. *Hint: put **three** spare batteries in your backpack in case your i>Clicker fails!*

You must be present to earn participation points.

Asking another student to click for you OR clicking for someone else is *obviously* cheating.

Anyone using more than one clicker will receive an F for the course.

Group Presentation –*Grading Rubrics and specific dates for this project will be posted on Blackboard.*

To foster your confidence in exploring, discussing and sharing scientific information, you will work in a group to prepare one **short**, **ten-minute** presentation. *Your main objective is to provide a memorable lesson that will help your classmates to master the material.* You will need to meet outside of class times to prepare your presentation.

Group Structure: Groups will consist of 3 students, hopefully from the same lab section. Dr. Hamilton will facilitate group formation.

Presentation Dates and Topics: Four groups will present on different subtopics of the main theme on each presentation day. **Your individual evaluation of your group is due one class day after your presentation.**

Theme	Group ID	Subtopic
A Tour of the Cell	A1	Prokaryotic Cells versus Eukaryotic Cells
	A2	A Tour of the Eukaryotic Cell:
	A3	A Tour of the Eukaryotic Cell:
	A4	Structure of the Cell Membrane
The Life and Times of a Normal Cell	B1	Overview of the Cell Cycle (including function/use)
	B2	Importance of Checkpoints in G1 and G2 in Interphase
	B3	Mitosis: Prophase, Metaphase, Anaphase
	B4	Mitosis: Telophase and Cytokinesis & how they differ in animals and plants
Living or Not: Viruses	C1	Diversity of Viruses: an Overview of Structure
	C2	The Bacteriophage Lysogenic Cycle
	C3	The Bacteriophage Lytic Cycle
	C4	Use in Biotechnology
Our Biotechnology Toolbox	D1	Polymerase Chain Reaction
	D2	Bacterial Transformations
	D3	DNA Sequencing
	D4	Cloning: Dolly the Sheep

Presentation Guidelines:

- Your goal is to provide your classmates a valuable learning opportunity.
- The presentation can be **no more than ten minutes**! You will lose points if you go over time.
- Stick to your assigned subtopic and be aware of the other subtopics in your session (so you don't waste your time on someone else's project).
- Your group will need to decide on roles for each member and each member **must** take part in the preparation and/or presentation of your project. Some suggested roles are: group chairperson, secretary, textbook research, internet research, illustrations/graphics, presenter, videographer, audio-visual technician. Your assigned roles are due to me one week before your presentation.
- Your presentation can be creative! You are welcome to make use of any resources we have available, including laptop, internet, document camera (overhead projector), and any materials you wish to bring with you. You can provide a straightforward presentation of the information, or you can perform a skit, song, or puppet show, you can show a video or animation produced by your group, or your can use any other creative means you can think of to share information.
- Your classmates will be grading you according to the value they receive from your work, so bear in mind that content delivery is key.
- Be sure to practice! If you cannot complete your lesson in ten minutes, your score will suffer!

When your group is not presenting:

- Be attentive in support of your peers! This is a big class, and it can be intimidating to present to a large group!
- You earn one bonus participation point for attending class on group presentation days.
- You are responsible for judging the work of your peers. Your main criterion is: ***how well did the presentation help me to learn the material***

Tentative Course Outline

(Subject to Change)

Lecture Schedule	
Chapter #	**Campbell**
1	Introduction/Science
2	Chemistry of Life
3	Water and Life
4	Carbon
5	Macromolecules
6	The Cell
7	Membranes
8	Metabolism
9	Cellular Respiration
10	Photosynthesis
12	Cell Cycle
13	Meiosis
14	Mendelian Genetics
15	Chromosomes
16	Molecular Basis of Inheritance
17	Transcription and Translation
22	Darwin and Evolution
23	Population Genetics
24	Speciation
	Additional if time

The above schedule and procedures in this course are subject to change in the event of extenuating circumstances

Components of the Grade

Course Component	Possible Points
Exam 1 (Feb. 16; Ch. 1-7)	100
Exam 2 (March 13; Ch. 8-10, 12)	100
Exam 3 (April 17; Ch. 13-17)	100
Exam 4 (May 17; Ch. 18-24)	100
Group Presentation	50
Mastering Biology Assignments	~180
Class Participation	~40-70
Lab	300
TOTAL POINTS POSSIBLE	**~1000**

TUTORING ON CAMPUS – Free tutoring services are available to assist you in most disciplines, including in biology! Library 112; Phone (209) 667-3642; Web http://www.csustan.edu/Tutoring

CAMPUS COUNSELING SERVICES – Overwhelmed by the stress of juggling classes and your home life? Our campus offers **excellent** counseling services to help support you! MSR 210; Phone (209) 667-3381; Web http://www.csustan.edu/Counseling/