

BIOL 1050-001 GENERAL BIOLOGY I - Spring 2014

Instructor: Dr. Marina M. Gerson

Office: N-272

Office Hours: Monday and Friday 2-3:30 and by appointment

Contact Information: my office (*best*) or mgerson@csustan.edu (*good*) or (209) 664-6547 (*worst*)

About the instructor: Dr. Gerson grew up in Southern California. She attended UC Santa Cruz for a degree in Environmental Studies and Biology. After college, she had a summer internship in S.F. Zoo's Insect Zoo. She then worked as a technician in a cardiovascular development lab at UC San Francisco; the lab used zebrafish as a model organism. After working for two years, she moved on to University of Texas at Arlington to earn her Ph.D. in Quantitative Biology. Her research centers on the behavior and ecology of lizards, with a focus on desert lizards of the American west. She loves traveling and working in Latin America, SCUBA diving, snorkeling, hiking, and reading.

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*, 10th edition by Reece et al., 2013, ISBN 0321775651

- 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 and 9th editions are also fine to use, but you may wish to compare them to the 10th.
- 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 9780874840537 (optional)

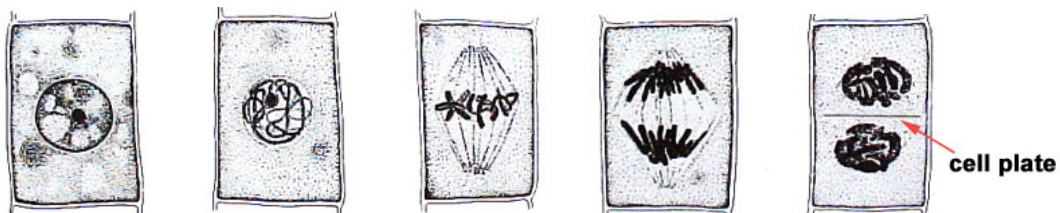
- This little book is optional, but it's really cheap.
- This book can help you learn to make sense of the language that biologists use. If you keep it handy, you will find it to be a valuable reference in this class and in others throughout your career. Making the language of biology your own is one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

3. The i>Clicker is required for this course. Any version of i>clicker will work, except for the smart app.

- 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.
- Register your iClicker at www.iclicker.com right away! Be sure to use your CSU Stanislaus ID number.
- 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 1050-001 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 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 properties of living things. (LE)
- 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 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)
- Biology techniques used to understand living things. (LE, LA)



Students will:

- Develop study skills for success in science coursework. (LE, LA)
- 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)
- Conduct themselves and their activities in a professional manner. (LE, LA)

**Additional Course 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

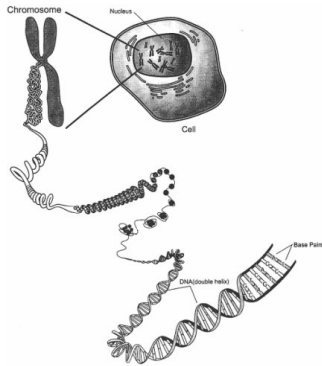
Prerequisite: Grade of A or B in high school biology, satisfactory score on biology qualifying examination, or BIOL 1010.

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 may 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. There are typically no make-up assignments in this course.

The last day to drop a class is February 21. The last day to apply for the CR/NC grading option is April 30. To change your grading option, fill out a yellow Add/Drop form: drop the course for credit and add the course for CR/NC. You will need my signature.



Course Component	Possible Points	Point Range	Grade Earned
Syllabus exercise	10	930-1000	A
Exam 1	100	900-929	A-
Exam 2	100	875-899	B+
Exam 3	100	830-874	B
Final Exam	100	800-829	B-
Group Presentation	75	775-799	C+
Mastering Biology Assignments	125	730-774	C
Class Participation	90	700-729	C-
Lab	300	675-699	D+
TOTAL POINTS POSSIBLE	1000	630-674	D
		600-629	D-
		<600	F

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. If you have a legitimate excuse to miss a lecture exam, I need to know the reason, in writing, at least a week before the exam date. Arrangements for taking the exam at another time must be made at the time of the written request. If you have an emergency less than a week before an exam, you must let me know of the emergency prior to the exam time if possible. You must provide a valid, written excuse on or before the next class period after the exam date, in order to be able to take the exam at an alternate time. If the emergency lasts beyond the next class period after the exam, you must at least let me know about the situation, and you must bring a valid, written excuse as soon as you return to school. I will determine the appropriateness of taking the missed exam in this case.
- **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. Please 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 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.

Special circumstances: I understand that unusual circumstances can temporarily alter your availability for our class. If you know ahead of time that you will have a conflict on an important day, please get in touch with me as soon as possible. If an unforeseen incident causes you to miss an exam or presentation, get in touch with me *as soon as your circumstances allow.*

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.

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/>

STUDENT HEALTH CENTER – You have already paid for access to health care on campus. Services include: birth control, flu shots, immunizations, pharmacy, check-ups, HIV testing, TB tests, and *doctor's notes for when you are sick!* Phone (209) 667-3396; Web <http://healthcenter.csustan.edu>

Tentative Course Outline

<u>Week</u>	<u>Lecture Topic(s)</u>	<u>Reading</u>
Jan 27 Jan 29 Jan 31	Syllabus & Course Introduction Science and the Scientific Method Chemistry of Life	-- 1 2
Feb 3 Feb 5 Feb 7	Chemistry of life: Water Carbon	3 4
Feb 10, 12, 14	Macromolecules	5
Feb 17, 19 Feb 21*	Metabolism A Group Presentations: Tour of the Cell & Membrane Structure	8 6, 7
Feb 24 Feb 26 Feb 28	Membrane Function Catch-up and Review EXAM ONE	7 1-8 Ch 1-8
Mar 3 Mar 5 Mar 7	Cellular Respiration	9
Mar 10 Mar 12 Mar 14	Photosynthesis Cell Communication	10 11
Mar 17 Mar 19* Mar 21	Cell Communication cont. B Group Presentations: Cell Cycle and Mitosis Catch-up and Review	11 12 9-12
Mar 24 Mar 26 Mar 28	EXAM TWO Meiosis Mendelian Genetics	Ch 9-12 13 14
Mar 31 Apr 2 Apr 4	César Chávez Holiday – NO CLASSES Chromosomal Basis of Inheritance Molecular Basis of Inheritance	-- 15 16
Apr 7 Apr 9 Apr 11	Molecular Basis of Inheritance cont. Transcription and Translation	16 17
Apr 14 Apr 16 Apr 18	Transcription and Translation cont. Catch-up and Review EXAM THREE	17 13-17 Ch 13-17
Apr 21, 23, 25	SPRING BREAK – NO CLASSES	--
Apr 28 Apr 30 ^G May 2*	Genetic Expression Genome Evolution C Group Presentations: Viruses	18 21 19
May 5* May 7 May 9	D Group Presentations: Biotechnology Descent with Modification Population Genetics	20 22 23
May 12 May 14 May 16	Speciation & Evolution Catch-up and Review Review	24 18-24 1-24
Fri. May 23	COMPREHENSIVE FINAL EXAM 8:30-10:30 am	Ch 1-24

*Group Presentation Dates ^G Last date to change grading option

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 125 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 three midterms and a required comprehensive final. Midterms will consist of 50 questions to be answered on a Scantron (bring your Scantron 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 that is associated with lecture. I encourage you to study the material more deeply using your text book and the Mastering Biology site, in order to perform well at the level of the test. Scantron questions will be valued at 80 points on each exam and short answer at 20 points.

The required comprehensive final will consist of 100 multiple choice questions. Some questions may be the same as those used on the midterms, but others will be different.

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 my first exam catch you by surprise! This course is content-heavy, and you will **not be able to cram** with much success for my 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.**
- The Preview-Review Questions associated with each lecture chapter are your Study Guide. Be sure you can thoroughly answer each one without referring to the textbook or notes.
- 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.
- **You need to study the material more deeply in the text than is covered in lecture, in order to be able to readily answer questions on the exams.**
- Every lab point can count in your favor, or against you. Make sure performing well in lab is part of your plan for success.

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*. You can earn clicker points every day just for showing up and participating in class. 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 – Check on Blackboard for the Grading Rubrics for this project.

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 six students from the same lab section. Dr. Gerson 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.**

Date	Theme	Group ID	Subtopic
February 21	A Tour of the Cell Section 005	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
March 19	The Life and Times of a Normal Cell Section 002	B1	Overview of the Cell Cycle (including function/use of mitosis)
		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
May 2	Living or Not: Viruses Section 003	C1	Diversity of Viruses: an Overview of Structure
		C2	The Bacteriophage Lysogenic Cycle
		C3	The Bacteriophage Lytic Cycle
		C4	Vaccines & the Immune Response
May 5	Our Biotechnology Toolbox Section 004	D1	Polymerase Chain Reaction
		D2	Recombinant DNA & Genetically Modified Organisms
		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 you can use any other creative means you can think of to share information.
- Your classmates will grade you according to the value they receive from your work, so remember 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?**

