

BIOL 1050 GENERAL BIOLOGY I - Spring 2010**Instructor:** Dr. Marina M. Gerson**Office:** N-272, **Office Hours:** Wednesday 2:30-4:30, Thursday 11-12**Contact Information:** mgerson@csustan.edu or (209) 664-6547**Website:** <http://science.csustan.edu/gerson/>**Texts:** *Biology*, 8th edition by Campbell and Reece, 2008, ISBN 978-0-8053-6844-4*A Bat Man in the Tropics* by Fleming, 2003, ISBN 0-520-23606-8*Dictionary of Word Roots and Combining Forms* by Borror, 1988, ISBN 0874840538 (optional)The iClicker is **required** for this course**MMG Furlough Days:** Feb 25, March 15 & 25, April 21, May 6 & 14. I will not be available on campus nor by e-mail on these days.**COURSE DESCRIPTION AND OBJECTIVES*****Purpose of Course***

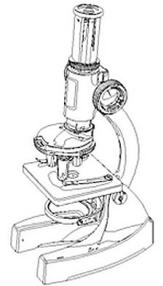
The purpose of the introductory series is twofold: (1) to introduce students to the breadth of the biological sciences and (2) to give beginning biology majors the fundamentals needed in subsequent courses.

This course is the first course in the series and will focus on cellular and molecular biology, and microevolution, to explain the diversity of life at the level of the most fundamental unit of life, the cell, and how cells adapted to and exist in specific environments.

Learning Objectives

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

- The importance of membranes to cells
- The flow of information within cells, between cells, and between the environment and cells
- The flow of energy within cells, between cells, and between the environment and cells
- The principles of homeostasis to processes that maintain cell functions
- The chemical principles of macromolecules and formation of cellular structure and with cellular functions
- The relation between cell structure and function
- The dynamics of cellular reproduction in reference to the cell cycle, growth and apoptosis
- The origins of life and the evolution of prokaryotic and eukaryotic cells and multicellularity
- How the cell integrates into the hierarchical organization of living systems
- The main ways cells acquire, transport, process, use, and transfer nutrients
- The molecular biology techniques used to understand the cell



Students will be able to:

- Apply the scientific method to the solution of biologically-based problems
- Identify information needs; access, critically evaluate, and apply scientific information
- Function effectively and safely in the laboratory
- Use a range of written and oral communication skills
- Apply effective learning strategies
- Think independently, yet function as a productive member of a team when appropriate

Students will:

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

***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.
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.
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.
4. To provide the framework to understand, examine critically and use information from various reliable sources to answer future biological questions.
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.
6. To develop more informed views of the connections of biology with respect to current and future issues of ethical judgment and social responsibility.

Course Requirements

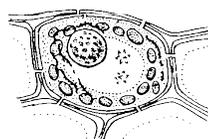
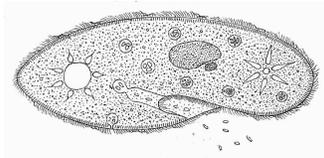
Pre-requisite: Grade of A or B in high school biology; satisfactory score on biology qualifying examination, or BIOL 1010.

Course Outline

Week	Lecture Topic(s)	Reading (Campbell & Reece; Ted Fleming)
Feb 17, 19	Course Introduction Science and the Scientific Method	1
Feb 22, 24, 26	Chemistry of life	2, 3, 4, 5
Mar 1, 3, 5	The Cell: Tour of the Cell, Membrane Structure & Function	6, 7
Mar 8, 10, Mar 12	The Cell: Metabolism EXAM ONE – Check your Grade on Blackboard	8 Ch 1-8, TF Preface-4
Mar 15 Mar 17, 19	FURLOUGH DAY 1 – This is Census Date – Cell Respiration The Cell: Cellular Respiration	Furlough 1 - Ch 9 9
Mar 22, 24, 26	The Cell: Photosynthesis, Cell Communication, Cell Cycle	10, 11, 12
Mar 29 Mar 31 Apr 2	Genetics: Meiosis Cesar Chavez Holiday Genetics: Mendel	13 -- 14
Apr 5, 7, 9	Spring Break	--
Apr 12, 14, 16	Genetics: Chromosomal and Molecular Basis of Inheritance	15, 16
Apr 19 Apr 21 Apr 23	EXAM TWO FURLOUGH DAY 2 - VIRUSES Genetics: Transcription, Translation	Ch 9-16, TF 5-9 Furlough 2 – Ch 19 17
Apr 26, 28, 30	Genetics: Translation, Expression	Ch 17, 18
May 3, 5, 7	Genetics: Biotechnology, Genomic Evolution	Ch 20, 21
May 10, 12 May 14	Population Genetics and Microevolution: Evolution & Mechanisms WARRIOR DAY (no afternoon classes) – MMG on FURLOUGH 3	Ch 22, 23 Furlough 3
May 17, 19, 21	Speciation Catch-up	24 16-24
May 24	Exam Three	Ch 17-24, TF 10-Epi
Wed June 2	OPTIONAL COMPREHENSIVE FINAL EXAM 11:15-1:15 pm	Ch 1-24

Assessment Methods, Grades, and Grading

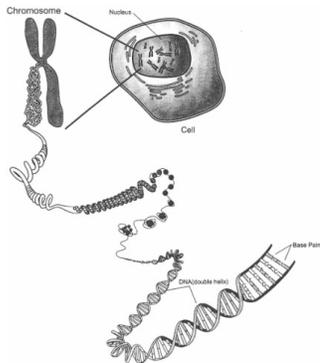
The best assessment measure for content-heavy courses is the objective exam. Most of your grade for the lecture portion of the course will be based on lecture exams. Participation points will be available daily in lecture, through participation with your clicker. Questions will include pre-test quiz 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.



<u>Course Component</u>	<u>Possible Points</u>
Exam 1	175
Exam 2	175
Exam 3	175
Class Participation	100
Bat Man Discussion Board	75
Lab	300
TOTAL POINTS POSSIBLE	1000

I offer an optional comprehensive final exam.

If you choose to take the final, your grade on the final will replace your lowest test score, even if the final score is lower.



<u>Point Range</u>	<u>Grade Earned</u>
930-1000	A
900-929	A-
870-899	B+
830-869	B
800-829	B-
770-799	C+
730-769	C
700-729	C-
670-699	D+
630-669	D
600-629	D-
<600	F

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. Ten percent per day (counting weekends and holidays) will normally be subtracted from homework turned in late. No late homework assignment or extra credit assignment will be accepted after that graded assignment has been returned to the class. There are typically no make-up assignments in this course.

The last day to drop a class is March 15. The last day to apply for the CR/NC grading option is April 26. 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.

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. 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 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.

How you Earn your Grade in Lecture

Exams

There will be three midterms and an optional 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 from lecture and the assigned reading. Scantron questions will be valued at 125 points on each exam and short answer at 50 points. If you commit to taking the comprehensive final, your grade on the final **will replace** your lowest exam score.

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.
- 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 text book 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 text book, 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

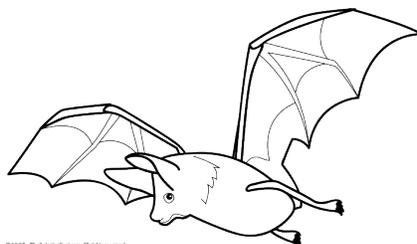
In class – You will use your clicker to respond to in-class questions. This helps me gauge your level of comprehension and will help me with the pacing of the material. It also allows me to reward you for being dedicated in your lecture attendance. I know things come up, and you might miss a day or two of class; don't worry, it will be safe to miss a few days without penalty.

You must be present to earn participation points. Asking another student to click for you OR clicking for someone else is cheating. Anyone using more than one clicker will receive an F for the course.

A Bat Man in the Tropics Discussion Board

Ted Fleming's memoir is a reflection on the life and development of a biological researcher, as times, people, and technologies change. Sometimes Ted focuses on scientific theory, but at other times he comments on the difficulties of balancing career and family or even on politics and relationships with colleagues. I feel that by reading this book, you'll gain a broader perspective on the study of biology and a better understanding of life in academics. "Personal development" is an important theme for me. One of my hopes for this semester is that you will see progress in your own personal development, both as an individual and as a scholar. I hope that reading about Ted Fleming's personal pathway will give you insight into your own possibilities, and I encourage you to connect his past with our present and future. Look for the funny parts of his story, or the surprising parts, or the parts where Ted is out of his element. Look for the parts you can relate to, and the parts you can't relate to at all. We often learn the most when we are completely out of our element and feel most uncomfortable.

So where do the points come from? The assigned chapters are due at each exam date. **For each of the three periods of time, make three unique, thoughtful postings** on the discussion board. **Your unique postings are due before the exam time.** Your post can comment on the reading or on another person's post. It must contain some substance, so it cannot simply be an affirmation of someone else's post. For example, you cannot just respond to another post with "I agree!" or "I disagree!" You should fully explain your position. In general, posts should be at minimum of five sentences long. **Don't forget our culture of respect for our classmates.** If you do disagree, please explain your opposing position politely.



Furlough Day Assignments

My furlough days are noted on my syllabus. Please realize that my furlough days may not be the same days as those taken by your other instructors or by staff in the various offices on campus. On furlough days, you are still responsible for learning course material through reading of the textbook and through the following materials. Of course, you should use the student study guide that came bundled with your text, as well!

Furlough Day One – Topic: Cell Respiration

YouTube Videos -

This is a very good overview of cellular respiration, made by students:

<http://www.youtube.com/watch?v=AdtAu5JgOV0&feature=related>

Professor Fink's Lecture on Cellular Respiration (~60 minutes to watch all 7)

Part 1 - ATP

<http://www.youtube.com/watch?v=WxQeKBHAdn8&feature=related>

Part 2 – Electron Transport Molecules

<http://www.youtube.com/watch?v=Gfo7df5tiKU&feature=related>

Part 3 - Glycolysis

<http://www.youtube.com/watch?v=6AhdTZ03Mvg&feature=related>

Part 4 – Glycolysis and Fermentation

http://www.youtube.com/watch?v=Zc_rhzn3tPA&feature=related

Part 5 – Krebs Cycle

<http://www.youtube.com/watch?v=dCvfr4yJ8w&feature=related>

Part 6 – Electron Transport

<http://www.youtube.com/watch?v=7lkA5yaqY7c&feature=related>

Part 7 – Oxidative Phosphorylation

<http://www.youtube.com/watch?v=D68uKTG6H0o&feature=related>

Furlough Day Two – Topic: Viruses

Video – Howard Hughes Medical Institute on “Microbe Hunters: Tracking Infectious Agents” (57 minutes)

Scan down to the 1999 Holiday Lecture Series to find this title.

This is a GREAT video, so bear with the host through the introductions.

<http://www.hhmi.org/biointeractive/disease/lectures.html>

Furlough Day Three – Topic: Evolution

Video - VIEW ONLY “Fossils, Genes, and Mousetraps, by Kenneth Miller, Ph.D.” This is an 88-minute video, so plan ahead.

<http://www.hhmi.org/biointeractive/evolution/lectures.html>

