

General biology – Fall 2012 Syllabus

Class: BIOL 50, MWF 11:30-12:30, Galileo 201
Professor: Rebecca Jabbour
Office Hours: MWTh 4:30-5:30
Office: 232 Brousseau
Phone: 925-631-8208
E-mail: rsj2@stmarys-ca.edu

Required Text:

What Is Life? A Guide to Biology, by Jay Phelan
Additional readings will be posted to GaelLearn.

Required Internet Resource:

Prep-U website (free with purchase of new textbook): www.prep-u.com

Recommended Internet Resource:

Book Companion Site for *What Is Life?* (free):
http://bcs.whfreeman.com/phelan1e/default.asp#t_498639 _____
[Prep-U can also be accessed through this site]

Course description:

This course is an introduction to the major concepts and theories of biological science, designed for students who are not majoring in biology. It satisfies the Scientific Learning Outcomes of the Mathematical and Scientific Understanding Learning Goal. The course will consider biological science as both a body of knowledge and a process by which we ask questions about and gain understanding of the natural world. It will cover topics such as cells and energy, DNA and inheritance, evolution and life's diversity, ecology, and conservation. Major themes include the hierarchical nature of biology, from molecules and cells to organisms and ecosystems, and the interconnectedness of life on Earth. Social and ethical issues, such as those that arise in relation to developments in genetics and in conservation, will be discussed. The relevance of biological understanding for our personal lives and for our collective future will be emphasized.

This course must be taken concurrently with BIOL 51, a weekly three-hour laboratory that accounts for 20% of the final course grade in BIOL 50.

Learning Outcomes:

1. Demonstrate basic knowledge of scientific thinking, chemistry, cells, energy acquisition, genetics, cell division, and Mendelian inheritance.
 - This outcome will be assessed primarily through Midterm 1.
2. Demonstrate basic knowledge of evolution and life's diversity.
 - This outcome will be assessed primarily through Midterm 2.
3. Critically evaluate a news report on a biological discovery, based on your knowledge of scientific thinking.
 - This outcome will be assessed through the Bio in the News assignment.
4. Apply your knowledge of ecology, ecosystems, and conservation to creating a written overview of a selected organism's adaptations to and interactions with its biotic and abiotic environments.
 - This outcome will be assessed through the Final Paper.
5. Examine social or ethical issues that arise in the process of scientific inquiry or out of scientific or technological developments.
 - This outcome will be assessed through the Social/Ethical Issues Paper.
6. Collect, analyze, and interpret empirical data gathered in the lab and field.
 - This outcome will be assessed through BIOL 51 lab quizzes.

Basis for Final Grade:

Your grade will be based on:

Midterm 1 – 20%

Midterm 2 – 20%

Homework – 10%

Bio in the News – 10%

Final Paper – 20%

Lab – 20%

Also, good classroom participation can push a borderline grade up to the higher grade.

Midterms:

Midterms will consist of multiple choice and short answer questions. Short answer questions are answered with a brief paragraph. Your study guide will be the Check Your Knowledge section, including both multiple choice and short answer questions, at the end of each chapter covered on the midterm. The questions on the midterms may not be the same as these questions, but you will be well-prepared for the midterms if you understand why the correct answers are correct AND why the incorrect answers are wrong.

There will be no final exam.

Homework:

It is easy to get full credit for the Homework component of your grade. The only requirement is that you must take at least two online quizzes (10 questions each) every week on the chapter assigned for that week. You may take the quizzes at any time before the following Monday at 5AM; you will receive no credit for taking only one quiz by this time, and you will receive no credit for late quizzes. For example, by the time I get up and turn on my computer at 5AM on Monday, Sept 13 (beginning of Week 3), you must have taken at least two quizzes on Chapter 2 (assigned for Week 2). Your quiz scores are not a factor in your grade, but you are encouraged to study and try to do your best in order to make the most of this self-testing opportunity. You are welcome to take the quizzes with a classmate, if you think you will both benefit from collaboration and discussion.

The online quiz application, Prep-U, can be accessed at www.prep-u.com. You will have to register so you can take the quizzes, and you will have to enroll in our course (on the website) so I will know you have taken them. The class code is jabbour963. We will look over the website together in class. You can also refer to directions in the Prep-U Student Guide posted to our GaelLearn site, under the Course Information tab.

Bio in the News:

Biology is in the news every day. If you browse any major news website, you will find articles about new discoveries in biology, and you will find articles about current events that can only be understood in terms of biology. Every citizen should know something about biology, and many of us find it fascinating, as well.

In order to encourage you to get in the habit of reading and thinking about biology in the news, many classes will begin with brief student presentations and discussions of biology-related news stories. For your presentation, you will select a biology-related news article from *The New York Times* or *Science News* that you think is interesting. On a scheduled day, you will make a very brief presentation to the class about the article you have selected, and you will turn in a short write-up. The full assignment is given on a separate handout.

Final Paper:

You will submit a final paper in place of a final exam. It will be a short research paper (3-4 pages single-spaced) on an organism of your choice, based on library resources. Although this organism will be the focus of the paper, your paper will be expected to reflect your understanding of the topics covered during Weeks 11, 12, and 14 (Ecology, Ecosystems, and Conservation). An important part of the paper will be a thoughtful discussion (1 page single-spaced) of social and ethical issues relating to the conservation of this species. The full assignment will be given out and discussed later in the semester.

Social/Ethical Issues Paper:

You will submit a paper (1 page, single-spaced) that thoughtfully discusses social or ethical issues that arise from a recent development in biological science. Such issues will be addressed in class periodically throughout the semester. The full assignment will be given out and discussed later in the semester.

Lab:

BIOL 50 must be taken concurrently with BIOL 51, General Biology Laboratory. You will receive a separate syllabus for your lab section, and your grade in this lab section will constitute 20% of your BIOL 50 course grade. In lab, you will gain hands-on experience with science as a process. You will explore biological questions by collecting, analyzing, and interpreting data. You will also observe biological specimens in order to gain firsthand appreciation of their distinguishing characteristics. Regular lab quizzes will be used to assess your learning.

Academic Honor Code:

I expect students to uphold the Academic Honor Code. Academic dishonesty will be reported to the Academic Honor Council. Please refresh your memory of the pledge below and refer to the Student Handbook for details.

As a student member of an academic community based in mutual trust and responsibility, I pledge:

- to do my own work at all times, without giving or receiving inappropriate aid;
- to avoid behaviors that unfairly impede the academic progress of other members of my community; and
- to take reasonable and responsible action in order to uphold my community's academic integrity.

Student Disability Services:

Reasonable and appropriate accommodations, that take into account the context of the course and its essential elements, for individuals with qualifying disabilities, are extended through the office of Student Disability Services. Students with disabilities are encouraged to contact the Student Disability Services Coordinator at (925) 631-4164 to set up a confidential appointment to discuss accommodation guidelines and available services. Additional information regarding the services available may be found at the following address on the Saint Mary's website:

<http://www.stmarys-ca.edu/academics/academic-advising-and-achievement/student-disability-services.html>

SCHEDULE

Part 1: Foundations of Biology

WEEK 1 – INTRODUCTION TO BIOLOGY

Reading: Chapter 1

Mon, Aug 30 – Course Intro

Wed, Sept 1 – What Is Science?

Fri, Sept 3 – Big Themes in Biology

WEEK 2 – CHEMISTRY

Reading: Chapter 2

Mon, Sept 6 – HOLIDAY

Wed, Sept 8 – Chemistry and Energy Storage

Fri, Sept 10 – Water

WEEK 3 – CELLS & ENERGY

Reading: Chapters 3 and 4

Mon, Sept 13 – Cells

Wed, Sept 15 – Cells/Energy Production

Fri, Sept 17 – Photosynthesis and Cellular Respiration

WEEK 4 – DNA & CELL DIVISION

Reading: Chapters 5 and 6 (pp. 208-224)

Mon, Sept 20 – DNA

Wed, Sept 22 – DNA

Fri, Sept 24 – Chromosomes and Cell Division

WEEK 5 – INHERITANCE

Reading: Chapters 6 (pp. 225-247) and 7

Mon, Sept 27 – Chromosomes and Cell Division

Wed, Sept 29 – Mendelian Inheritance

Fri, Oct 1 – Genetics Review

Part 2: Evolution and Life's Diversity

WEEK 6 – EVOLUTION

Reading: Chapter 8

Mon, Oct 4 – **Midterm 1**

Wed, Oct 6 – Natural Selection and Darwin

Fri, Oct 8 – Evolution and Populations / Studying Evolution

WEEK 7 – DIVERSITY OF LIFE

Reading: Chapter 10

Mon, Oct 11 – Origins of Life

Wed, Oct 13 – Species

Fri, Oct 15 – Speciation and the Tree of Life

WEEK 8 – ANIMALS

Reading: Chapter 11

Mon, Oct 18 – What is an animal?

Wed, Oct 20 – Animal Diversity

Fri, Oct 22 – Human Evolution

WEEK 9 – PLANTS & FUNGI

Reading: Chapter 12

Mon, Oct 25 – What is a plant?

Wed, Oct 27 – Plant Diversity

Fri, Oct 29 – Fungi

WEEK 10 – MICROBES

Reading: Chapter 13

Mon, Nov 1 – Bacteria

Wed, Nov 3 – Archaea, Protists, Viruses

Fri, Nov 5 – Evolution of antibiotic resistance, Review

Part 3: Everything is Connected

WEEK 11 – ECOLOGY

Reading: Chapter 14

Mon, Nov 8 – **Midterm 2**

Wed, Nov 10 – What is ecology?

Fri, Nov 12 – Life History, Human Population Growth

WEEK 12 – ECOSYSTEMS

Reading: Chapter 15

Mon, Nov 15 – Biomes and Weather

Wed, Nov 17 – Energy Flow and Chemical Cycles

Fri, Nov 19 – Species Interactions

WEEK 13 – DISCUSS PAPERS, GIVE THANKS

Reading: Focus on Final Papers

Mon, Nov 22 – Discuss Progress on Papers

Wed, Nov 24 – HOLIDAY

Fri, Nov 26 – HOLIDAY

WEEK 14 – CONSERVATION

Reading: Chapter 16

Mon, Nov 29 – Biodiversity

Wed, Dec 1 – Disruptions of Ecosystems

Fri, Dec 3 – Conservation Strategies

FINAL EXAM TIME: Wed, Dec 8, 11:30-1:30

Turn in and discuss papers.

LABORATORY SYLLABUS, Biology 51, Fall 2012

Laboratory Instructor: Christina Morales

E-mail: cqm1@stmarys-ca.edu

Class location: Brousseau 209

Class times: Wednesdays 2:15 – 5:15 pm or Thursdays 1:00 - 4:00 pm

Required text and materials:

- You should bring your lab handouts to lab each week. In addition, you will need to bring the following to lab:
 - Pencils/pens
 - A three-ring binder/notebook in which to keep notes and handouts
 - Calculator

Learning outcomes for students in the Biology 51 laboratory:

By the end of this course, students will be able to:

- Demonstrate understanding of and literacy in the content and principles of a scientific discipline
- Carry out scientific procedures in a socially responsible manner
- Accurately collect, analyze, and interpret data collected in the scientific laboratory or the field
- Perform laboratory or field procedures that explore biological content and principles

Assessment of Lab Learning Outcomes:

Learning outcomes will be assessed via completion of laboratory quizzes and

Grading:

You will not receive a separate grade for lab; however, your lab work contributes to 20% of your final course grade in Bio 50. Your lab score will be based on the following work:

PERCENTAGE OF LAB SCORE

Lab quizzes, attendance, and participation in lab activities: 100%

○ **Quizzes**

There will be 10 fifteen-minute quizzes given throughout the semester. The quizzes will be worth 15 points each and will be given on the dates each week. All quiz scores will count and no quizzes will be dropped. **Quizzes will be given at the beginning of the lab period. No late quizzes or makeup quizzes will be given.** The quizzes will cover material from the previous week's labs and will also have one or two questions on the lab you will be doing that day. Some of the questions asked on the quiz will be very similar to those found within and at the end of the lab exercises in your lab handouts.

○ **Attendance**

Attendance is mandatory. Attendance each week will count for 5 points each week. Late entry into the lab is 1 point for every 5 minutes. Absences will be excused only in an emergency. A physician must document absences due to illness.

○ **Lab Participation**

Participating in lab means coming to lab prepared, being on time, and

participating in your lab group. Lab participation will be graded as viewed by the lab instructor. Each week, up to 5 points can be earned during the lab.

Plagiarism and cheating:

St. Mary's has an Academic Honor Code. Part of this means the following: 1) Cheating will not be tolerated. This means you may not copy lab reports, copy quiz or practical answers from your classmates, bring a "cheat sheet" to lab, use cell phones during quizzes, etc; 2) Plagiarism is also not tolerated. Plagiarism refers to copying material from a source (textbook, lab manual, handout, etc.) without citing the source. It is not only unacceptable; it is illegal. If you plagiarize or cheat in any way, you will receive an "F" on your assignment or quiz, you will not be able to rewrite the assignment or re-take the quiz. Any suspected violations of the Academic Honor Code will be reported to the Academic Honor Council. If you are unsure about what plagiarism is or how to cite a source, please see your instructor before you turn in your assignment; I will be happy to help. For further information, please refer to handout titled, "Honor Code and SDS information."

BIOLOGY 51 LABORATORY SCHEDULE, FALL 2011

Laboratory Schedule

- Week 1: No lab, check-in via email
- Week 2: Lab 1, Introduction to Laboratory and Safety
Scientific Method and Digestion labs
- Week 3: Lab 2, Microscopy (animal and plant cells) - Quiz 1
Diffusion and Osmosis
- Week 4: Lab 3, Cell Respiration - Quiz 2
Modeling Photosynthesis: the Calvin Cycle
- Week 5: Lab 4, Mitosis and Meiosis - Quiz 3
- Week 6: Lab 5, Heritable traits - Quiz 4
- Week 7: **No Class: Midterm Holiday**
- Week 8: Lab 6, Population Genetics - Quiz 5
- Week 9: Lab 7, Caminacule Evolution - Quiz 6
- Week 10: Lab 8, Animal Diversity: Lab Dissections - Quiz 7
- Week 11: Lab 9, FIELD TRIP: Cal Botanical Gardens - Quiz 8
- Week 12: Lab 10, Microbial Diversity - Quiz 9
- Week 13: No lab
- Week 14: Lab 11, Owl Pellet Dissection - Quiz 10
- Week 15: Lab 12, FIELD TRIP: California Academy of Sciences