BIOL 101 Essentials of Biology

Cornell Prison Education Program
Cayuga Community College
Fall 2022

Instructor: Emily Wollmuth, PhD Candidate in Microbiology
3 Credit Hours

Description

Introduces selected topics which may include cell structure and division, tissues, nutrition, digestion, internal transport, respiration, neural control and locomotion, reproduction, genetics, microorganisms and disease, and selected topics in plant biology.

Learning Objectives

Upon completion of this course, students should be able to:

1. Apply the scientific method
2. Describe cellular components and their function
3. Compare and contrast prokaryotic and eukaryotic cells
4. Describe how cells synthesize ATP
5. Explain how cells divide
6. Describe how genetic traits are inherited and acquired
7. Describe the major human organ systems
8. Explain how pathogens contribute to diseases
9. Summarize the major tenants of evolution
10. Apply key concepts in biology to real-world problems

Textbook and Course Readings

We will also use the textbook below. A printed course reader will also be provided.

***Concepts of Biology**. 2013. Samantha Fowler, Rebecca Roush, James Wise. OpenStax.*

Grading

Study Guides: 10% (Completion 50%, Accuracy 50%)

You will be provided with a study guide for each week. The questions are designed to help you identify important material in the readings and synthesize concepts that will be applied to the lab activities and lecture. Study guides should be completed prior to class so that you have a basic understanding of the key concepts before lecture. However, you do not need to understand everything. We will discuss the most important topics in class. Most of the study guide will focus on the content for the next lecture, but they will also include a section to help you review

materials from the prior class. Study guide answers should be in your own words or paraphrase the text sources. Study guides may be discussed with classmates but should be completed independently. *Evidence of copying will result in full loss of points for that guide.* You will be partially graded on completion, so if you do not know an answer take your best guess even if you are unsure! There will be space at the end of each guide to write questions for the instructor. The instructor will return responses and requested explanations with the graded study guide. Study guides will be due at the start of the following class.

Lecture Guides: 5% (Completion 100%)

You will be provided with a lecture guide for each lecture. Each lecture guide will include an outline of the lecture with spaces to take notes during class. Lecture guides will be graded on completion only and will be due at the end of each lecture. You will show your completed lecture guide to the instructor at the end of each class.

Lab Activities: 50% (Participation 20%, Accuracy 80%)

Most weeks, class will be split into a lecture and lab portion. Labs will cover topics being discussed in lecture. Lab worksheets may consist of observations, drawings, data analysis, and short answer questions that you will work on in a small group. Part of your grade on the lab activities will be based on participating in group discussion. There are 10 lab activities, each worth 5% of your grade. Lab activities will be completed during class and will be due at the end of class.

Quizzes: 25%

After each module there will be a quiz to evaluate your knowledge of the learning objectives from the lectures in that module. Quizzes will be administered at the beginning of class and will include a few questions that can be completed in the first 15-20 minutes of class. For unexcused absences these quizzes cannot be made up later. If a student has an excused absence on a quiz day, then an alternate quiz or assignment may be given to give the student the opportunity to make up the missed points. There are 5 quizzes, each worth 5% of your total grade. Quiz dates are noted in the course schedule.

Final Project: 10% (Report 70%, Presentation 30%)

Instead of a final exam, you will complete a final project proposing a conservation strategy for an endangered species that you will choose from the course reader during week 12. Each student will choose a different species. You will produce a written report and give a 7-10 minute presentation describing your report in the last week of class. More information will be provided in class during week 13.

Letter Grades

93-100	A
90-92.9	A-
87-89.9	B+
83-86.9	B

80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
67-69.9	D+
63-66.9	D
60-62.9	D-

Attendance and Participation

Class attendance is mandatory and class participation accounts for 20% of the Lab Activities grade for this course (10% of the total grade). Students will get the most out of this course if they attend class and participate both in the activities and group discussions. To earn credit for lab participation, students are expected to be prepared for each class by having completed any required readings and to engage in the activities and discussion. However, absences for lab activities or quizzes will be excused under extenuating circumstances which include illness/injury, lockdown, and scheduled visits.

Academic Integrity

Any work submitted by a student in this course for academic credit must be the student's own work. The discussion of course concepts with other students is encouraged and this includes studying together, consulting another student for clarification on course topics, and asking for another student to edit written work such as an essay. *Copying another student's work is never allowed.* If a student is found to have copied the work of another student, both students involved will receive a zero on the assignment and will not be allowed to make up the assignment.

Inclusivity Statement

I value the unique perspectives, abilities, and backgrounds of all students. The Cornell Prison Education Program and I celebrate diversity and commit to providing a learning environment that fosters inclusivity. I am committed to creating a sense of belonging and community in our classroom. Throughout the course, I ask students to be open-minded and respectful of other students' opinions and unique viewpoints and to take advantage of this opportunity to learn from one another.

Course Modules

This course consists of five modules. After each module you will take a quiz on the materials covered during that module. The schedule for each module is noted in the course schedule.

Module 1: The Cellular Foundation of Life; **Module 2**: Cell Division and Genetics; **Module 3**: Molecular Biology and Biotechnology, **Module 4**: Animal Structure and Function; and **Module 5**: Evolution, Diversity of Life, and Conservation

Course Schedule

Week	Date	Lecture Topic	Lecture Reading	Lab Topic	Assignments Due
1	9/7	Module 1: Scientific method, chemistry of life	Chapter 1 (optional) Chapter 2 (optional)	Scientific method	Lab 1 Lecture Guide 1
2	9/14	Module 1: Cell structure and function	Chapter 3	Surface-area-to-volume ratio and diffusion	Study Guide 1 Lab 2 Lecture Guide 2
3	9/21	Module 1: Cellular metabolism and ATP synthesis	Chapter 4	Microbial metabolism	Study Guide 2 Lab 3 Lecture Guide 3
4	9/28	Module 1: Photosynthesis	Chapter 5	**No lab, student Q&A**	Study Guide 3 Lecture Guide 4
5	10/5	Module 2: The cell cycle, mitosis, and meiosis, **Quiz 1**	Chapter 6 Chapter 7	Cell cycle	Study Guide 4 Lab 4 Lecture Guide 5
6	10/12	Module 2: Patterns of inheritance	Chapter 8	Human genetics	Study Guide 5 Lab 5 Lecture Guide 6
7	10/19	Module 3: Replication and transcription, **Quiz 2**	Chapter 9.1-9.3	**No lab, student Q&A**	Study Guide 6 Lecture Guide 7
8	10/26	Module 3: Translation and gene regulation	Chapter 2 pg. 45-48 Chapter 9.4-9.5 Reader pg. 2-7	Epigenetics case study	Study Guide 7 Lab 6 Lecture Guide 8
9	11/2	Module 3: Genetic engineering and biotechnology	Chapter 10 Reader pg. 8-17	Molecular biology methods	Study Guide 8 Lab 7 Lecture Guide 9
10	11/9	Module 4: The body's systems, **Quiz 3**	Chapter 16 Chapter 18.1-18.2	**No lab, student Q&A**	Study Guide 9 Lecture Guide 10
11	11/16	Module 4: Viruses, the immune system, and disease	Chapter 17	Immunology activity	Study Guide 10 Lab 8 Lecture Guide 11
12	11/23	Module 5: Mechanisms and evidence of evolution, **Quiz 4**	Chapter 11 Reader pg. 18-30	Evolution case study, introduce project	Study Guide 11 Lab 9 Lecture Guide 12
13	11/30	Module 5: Diversity of life	Chapter 12	Phylogenetic trees	Study Guide 12 Lab 10 Lecture Guide 13
14	12/7	Module 5: Biodiversity loss and conservation, **Quiz 5**	Chapter 21 Reader pg. 19-45	**No lab, final project work time**	Study Guide 13 Lecture Guide 14
15	12/14	Final project presentations	**No reading**	**No lab**	Final project report