Course Information Form (CIF)

Course Code: BIO 141 (IAI L1 910L, BIO 910)

Course Title: Cell and Molecular Biology

Department: Natural Sciences
PCS Code: 1.1 - Baccalaureate/Transfer
CIP Code: 26.0101
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 4-3-5
Credit Hour Distribution:

Lecture: 4	Lab: 3	Clinical: 0	**Total: 5**

General Course Information

Catalog Description

General biology for students concentrating in life science or in a pre-professional health program. Topics include cell biology, bioenergetics, molecular biology, genetics, and biochemistry. Credit not given for both BIO 101 and the BIO 141-BIO 142 sequence.

General Course Objectives

Provide a knowledge base of general biological concepts. Provide opportunities for the development of critical thinking and problem solving skills. Develop some of the basic operational skills necessary to perform successfully in a biology laboratory.

Minimum Placement Levels

English	Reading	Math
Placement out of ENG 099	Placement out of CCS 098	None

Prerequisites

Credit in high school or college level chemistry within the last three years with a grade of C or higher

Methods of Evaluation

15 objective quizzes, 2 major exams (comprehensive midterm and comprehensive final exams), 1 essay lab report, 1 lab practical, and 12 lab handouts.

Instructional Materials and Additional Supplies

Biology, 2nd edition; Openstax (freely available online at www.tinyurl.com/bio141text)
BIO 141- Cell and Molecular Biology Laboratory Manual, Parkland College Biology Faculty

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Introduction to Science	1. Define and apply the Scientific Method. 2. Demonstrate the effective use of basic tools used in a biology laboratory.	4	6	0
Chemistry Review	1. Identify the components of the atom and describe how they can affect an atom's properties. 2. Recognize basic chemistry regarding water.	4	0	0
Chemical Building Blocks of Life	1. Recognize basic chemistry regarding proteins, lipids, carbohydrates, and nucleic acids. 2. Describe some fundamental concepts of organic chemistry.	4	6	0
Cell Structure and Function	1. Describe the structure of prokaryotic and eukaryotic cells and how they function, emphasizing passive and active membrane transport.	4	3	0
Cellular Respiration and Enzymes	1. Describe the fundamental concepts of energy and thermodynamics. 2. Describe the role of enzymes in cells, the physical and chemical nature of enzymes, and what factors affect enzyme reactions. 3. Describe the metabolic pathways of aerobic cellular respiration and fermentation.	4	3	0
Photosynthesis	1. Describe the metabolic pathways of photosynthesis in appropriate detail.	4	3	0
Patterns of Inheritance	1. Describe the basic principles of Mendelian inheritance. 2. Identify the basic types of inheritance found among animals.	8	6	0
How Cells Divide	1. Compare and contrast the events that affect chromosomal distribution and characteristics in meiosis and mitosis.	4	3	0
DNA Structure and Replication	1. Identify the structure of DNA. 2. Describe the events that occur during DNA replication. 3. Describe how DNA is replicated in vitro (PCR).	6	3	0
DNA Expression	1. Compare and contrast the roles and structures of DNA, RNA, and ribosomes in regard to making proteins.	6	6	0
Gene Technology	1. Describe the major techniques of genetic engineering and apply them to medicine, agriculture, chemical production, and scientific research.	6	6	0
Gene Regulation	1. Describe the basic functions of the lac and trp operons.	6	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
60	45	0