

Fall 2016

Biology 1

Faculty Name: Heather Butler

Program Head: Enter Program Head Here

Dean's Review:

Dean's Signature: _____ Date Reviewed: ____/____/____

Revised: Spring 2015

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



Biology 1

COURSE OUTLINE

Prerequisites: None

Course Description:

Introduces students to the basic processes of life and science in preparation for college biology (Biology 101). Emphasis is on mastery of core concepts and processes necessary for success in college biology. Topics include important themes in biology, chemistry, metrics, structure and function of the cell and cell transport, molecules of cells, enzymes, cell respiration, and photosynthesis. The student will also be introduced to the basic structure, function, and replication of DNA.

Semester Credits: 4 Lecture Hours: 3 Lab/Recitation Hours: 3

This course does not earn the student college credit.

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



Course Outcomes

At the completion of this course, the student should be able to:

- Describe the main themes in the study of life
- Describe the process of science using the scientific method
- Explain the chemistry of life
- Describe the basic structure and function of macromolecules of cells
- Describe the structures within and surrounding the cell, and explain their function
- Explain passive and active types of membrane transport
- Explain the basic structure and function of enzymes
- Explain the cellular processes of cell respiration and photosynthesis
- Describe the discovery of DNA and its basic function and structure

Biology 1 Required Materials:

Textbook:

Essentials of Biology, S. Mader and M. Windelspecht, 4th ed., McGraw- Hill Publishing, 2015. ISBN 978-0-07-802422-1. (currently on reserve in Brown Library and available for check-out by students)

Virginia Western Community College Biology 1 Lab Exercises, posted on Blackboard or provided as handouts

Other Required Materials:

Goggles for lab
Lab Notebook

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



Bio 1

Topical Description:

Chapter 1: Biology: The Science of Life

- The Characteristics of Life
- Evolution: The Core Concept of Biology
- Science: A Way of Knowing

Chapter 2: The Chemical Basis of Life

- Atoms and Atomic Bonds
- Water's Importance to Life
- Acids and Bases

Chapter 3: The Organic Molecules of Life

- Organic Molecules
- Biological Molecules of Cells

Chapter 4: Inside the Cell

- Cells Under the Microscope
- The Plasma Membrane
- The Two Main Types of Cells
- Eukaryotic Cells
- Outside the Eukaryotic Cell

Chapter 5: The Dynamic Cell

- What is Energy
- ATP: Energy for Cells
- Metabolic Pathways and Enzymes
- Cell Transport

Chapter 6: Energy for Life

- Overview of Photosynthesis
- The Light Reactions—Harvesting Energy
- The Calvin Cycle Reactions—Making Sugars

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273



Chapter 7: Energy for Cells

- Cellular Respiration
- Outside the Mitochondria: Glycolysis
- Outside the Mitochondria: Fermentation
- Inside the Mitochondria
- Metabolic Fate of Food

Chapter 11: DNA Biology

- DNA and RNA Structure and Function

Laboratory Topics

- Introduction to the Lab
- Lab Success and Safety
- The Metric System
- Scientific Method
- Microscopy
- Macromolecules
- Diffusion
- Osmosis
- Enzymes
- Photosynthesis

Notes to Instructors

1. Departmental policy dictates that instructors do not allow students to keep tests.
2. A comprehensive final exam counting 10% of the total grade will be given at the end of the semester.
3. Syllabus should state what the course grade will be based on, such as tests, quizzes, a comprehensive final exam, and any other assignments made by the instructor.

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
(540)-857-7273

