J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: BIO 102 **Credits:** 4

Course Title: General Biology II

Course Description: Focuses on diversity of life, anatomy and physiology of organisms, and ecosystem organization and processes in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes process of science, interdisciplinary approach, and relevance of biology to society. Part II of a two-course sequence. Prerequisite: Satisfactory completion of BIO 101. Lecture 3 hours. Recitation and Laboratory 3 hours. Total 6 hours per week.

General Course Purpose: This course is designed to meet the requirements of a transfer course in a science major's curriculum at a four-year college or university. This course fulfills the general education requirement for science.

Course Prerequisites and Co-requisites:
Prerequisite: Satisfactory completion of BIO 101

Course Objectives:
a. Given the different levels within the hierarchy of biology, students will be able to describe and analyze the interrelationships between structural elements at a particular level and the functions performed. Students will also be able to predict the resulting changes that may occur when a structural element of a hierarchy is changed.
b. Students will be able to explain the transformation of energy and matter within ecosystems.
c. Given any biological system, students should be able to explain how the interactions between parts make the system greater than the sum of its parts, and identify and describe the emergent property(ies) of the system. Students should be able to use a mathematical formula or a simulation program to predict how changes affect the system.
d. Students will be able to explain the process by which science seeks to understand the world around us. This should include the design of a hypothetical experiment to test a hypothesis either given to the student or derived by the student from observations provided. Students should be able to identify the role of observation in this process.

Major Topics to Be Included:
a. Structure and Function
b. Pathways and Transformations of Energy
c. Systems Biology
d. Evolution
e. Process of Science

Effective Date of Course Content Summary: August 16, 2017