

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: BIO 101 Credits: 4

Course Title: BIO 101 - General Biology I

Cinterdisciplinary approach, and relevance of biology to society. Part I of a two-course sequence. Assignments require college level reading fluency, coherent written communication, and basic mathematical skills. This is a Passport Transfer course. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week. 4 credits

General Course Purpose:

Biology 101 and Biology 102 comprise the standard sequence for Introductory Biology for science majors and also serve as a general education science course for non-majors. The courses use an interdisciplinary approach emphasizing the process of science and includes the relevance of science to society. The core concepts covered include: the process of science; evolution; structure and function; information flow, storage and exchange of genetic information; pathways and transformations of energy and matter; and systems biology. These two courses will expose students to a broad body of biological concepts that will guide them in building and developing skills that they can apply to real world situations. The lecture and laboratory components will emphasize the acquisition and integration of knowledge using the process of science as the basis for inquiry and analysis.

Course Prerequisites/Corequisites:

None.

Student Learning Outcomes:

Upon completing the course, the student will be able to:

[Core Competencies](#)

Competency 1: Process of Science

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Competency 3: Information Flow, Exchange, and Storage:

- Explain how information is stored in biological systems
- Describe how biological information is accurately replicated and how the information is processed and used by individual cells/organisms.
- Explain how the information flows from generation to generation
- Describe how the information flow results in the observable patterns of inheritance.
- Provide specific examples that show the application of these concepts.

Competency 4: Evolution

(These concepts are a primary focus in BIO 102, BIO 101 contains a broad overview.)

- Explain the process of evolution by natural selection, including molecular influences and how that process has affected all life forms in the past and continues to do so today.
- Students should be able to summarize the evidence for evolution and modifications made to the basic Darwinian explanation, using historical and current examples.

Competency 5: Structure and Function

- Give examples of how structure and function are interrelated in organisms at molecular, cellular, and organismal levels.

Competency 6: A Systems Approach to Biology

- Explain how the parts of the system interact to make the functioning system a whole entity.
- Describe the emergent properties in biological systems.

General Learning Outcomes**Scientific Literacy**

- Evaluate different perspectives, opinions, and statements about biological issues in terms of their logic, content, scientific merit, and biases.

Quantitative reasoning

- Perform accurate calculations, interpret scientific data and graphs, and use results to support conclusions.
- Analyze data collected through experiments in lab. Present and discuss the findings and conclusions derived from data, with chart/spreadsheet and graphs.

Critical thinking

- Discriminate among degrees of credibility, accuracy, and reliability of inferences drawn from given data, determine whether certain conclusions or consequences are suppo.

Major Topics to be Included:

- **Overview of Biology:** Characteristics of life, Scientific method, Levels of biological organization, Diversity of life
- **Chemistry of Life:** Foundations of biological chemistry, Atoms and molecules, Chemical bonds, Organic and inorganic compounds, Organic macromolecules
- **The Cell:** Prokaryotic and Eukaryotic cells, Plasma membranes, Membrane Transport, Energy and Metabolism, Enzymes, Cellular Respiration, Photosynthesis, Cell Reproduction
- **Molecular Biology and Genetics:** Simple Mendelian inheritance, Non-Mendelian Inheritance, DNA structure and function, The Genetic Code, Protein synthesis, Gene expression, Biotechnology
- **Evolution**