



South Central College

BIOL 115 General Biology I

Course Outcome Summary

Course Information

Description	This course covers biological processes at the cellular and molecular level. It serves as an introduction to macromolecules and metabolism, cell biology, Mendelian genetics, gene expression and development. This course involves a weekly three hour lab. (prerequisites: Score of 86 or above on the Sentence Skills portion of the Accuplacer or ENGL 0090 and a score of 50 or above on the College Level Math portion of the Accuplacer test or MATH 0085) MNTC area 3
Total Credits	4
Total Hours	80

Types of Instruction

Instruction Type	Credits/Hours
Lecture	
Lab	

Pre/Corequisites

Score of 86 or above on the Sentence Skills portion of the Accuplacer or ENGL 0090

Score of 50 or above on the College Level Math portion of the Accuplacer test or MATH 0085

Institutional Core Competencies

Communication - Students will be able to demonstrate appropriate and effective interactions with others to achieve their personal, academic, and professional objectives.

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Appreciate and explain the process of scientific discovery and methodology.

Learning Objectives

- List and describe the steps of the scientific method
- Demonstrate the process of scientific discovery in the lab

2. Develop the skills necessary to engage in the scientific method.

Learning Objectives

Formulate a hypothesis based on observations
Develop a method to test a hypothesis
Collect and analyze data
Interpret data and form a conclusion
Communicate scientific findings

3. Describe the chemical basis and biochemical origins of organisms.

Learning Objectives

Describe the effects of pH on living systems
Identify the types of chemical bonds within biological molecules
Describe the macromolecules within biological systems
Describe the properties of water

4. Compare and contrast different cell types.

Learning Objectives

Identify the structures and organelles associated with different types of cells.
Describe the functional activity of different cell types and their component parts.

5. Explain the energy flow within cells

Learning Objectives

Describe enzyme based biochemical reactions.
List the steps involved in photosynthesis.
Compare and contrast aerobic and anaerobic respiration.

6. Explain the mechanisms in cellular reproduction.

Learning Objectives

Describe asexual reproduction.
Describe sexual reproduction.

7. Characterize DNA

Learning Objectives

Describe the structure of DNA
Explain the process of DNA replication
Describe the molecular structure of the eukaryotic chromosomes

8. Explain the process of protein synthesis.

Learning Objectives

Explain the process of transcription.
Explain the process of translation.

9. Describe gene regulation

Learning Objectives

Identify several reasons why a cell would regulate its gene expression.
Account for the elements of positive and negative control within prokaryotic operons
Outline the features involved in efficient expression of eukaryotic structural genes.
Describe how transcription factors can be activated by signaling molecules and the ways in which they can interact with DNA.
Explain how gene expression can be regulated beyond the level of transcription.

10. Develop an understanding of Mendelian genetics

Learning Objectives

Explain Mendel's Laws of Inheritance
Explain the Chromosome Theory of Inheritance
Discuss X-linked inheritance
Develop and interpret pedigrees
Using Punnett squares, determine genetic probability
Describe X inactivation

11. Explain the process of development

Learning Objectives

Describe the process of cleavage, beginning at fertilization and leading to gastrulation
Trace the fate of cells in a gastrula as they differentiate into the three major germ layers
Outline the early development of the nervous system during neurulation
Explain the relevance and importance of the morphogenetic field, citing several experimental examples

12. Demonstrate safe laboratory practices

Learning Objectives

Be aware of any hazardous materials that may be used during experiments
Handle chemicals and equipment in a safe manner

13. Demonstrate the use of common laboratory instruments and practices

Learning Objectives

Use a microscope correctly and effectively
Use a spectrophotometer correctly and effectively
Use a digital balance correctly and effectively
Measure and dispense liquids with a pipette accurately
Interpret the size of DNA fragments on an agarose gel
Use biological stains to identify the four classes of biomolecules

14. Develop the ability to write lab reports

Learning Objectives

Identify and include components that are in a basic lab report
Recognize credible, peer reviewed sources
Format a bibliography
Use Excel to create an exponential curve , scatter graph and bar graph

SCC Accessibility Statement

South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: www.southcentral.edu/disability

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.