South Central College

BIOL 116 General Biology II

Course Outcome Summary

Course Information

Description This course covers biology at the organismal. population and system level. It will emphasize organismal diversity, population and community ecology and ecosystems. Students will gain an understanding of how evolutionary advances have occurred among organisms within a kingdom due to natural selection. This course involves a weekly three hour lab. (prerequisites: Score of 86 or above on the Sentence Skills portion of the Accuplacer test or ENGL 0090 and score of 50 or above on 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 test or ENGL 0090

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

Institutional Core Competencies

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. Explain the theory of evolution

Learning Objectives
Identify how Natural Selection has brought about evolutionary change
Describe the molecular processes that underlie evolution

4. Describe gene flow in natural populations

Learning Objectives
Explain evolutionary mechanisms and their effects on populations
Relate allele and genotypic frequencies in a population using the Hardy-Weinberg equation
Identify the different patterns that Natural selection can follow including directional selection, stabilizing selection, disruptive selection, balancing selection and sexual selection

5. Describe population genetics

Learning Objectives
Describe the Hardy-Weinberg Law
Use the Hardy-Weinberg Law to calculate allele frequencies in a population
Apply the Hardy-Weinberg Law to human populations
Define genetic drift and explain how it causes random changes in allele frequency in small populations
Explain how natural selection is a major force driving changes in allele frequency

6. Explain the origin of species

Learning Objectives
Identify the mechanisms of speciation
Define macroevolution and site examples of how it helps create new species
Compare and contrast gradualism and punctuated equilibrium
Discuss the genetics involved in evolutionary developmental biology

7. Describe environmental and biological changes that have occurred since the origin of the earth

Learning Objectives
Explain how environmental changes influenced the formation and extinction of species including mass extinctions
Discuss symbiotic and endosymbiotic relationships that gave rise to the eukaryotes

8. Become familiar with taxonomy

Learning Objectives
Apply scientific nomenclature to name organisms
Utilize taxonomy to classify organisms
Read and interpret a phylogenetic tree
Describe the three domain system and characteristics of each

9. Describe organisms from the domains Bacteria and Archaea

Learning Objectives
Describe the diversity and evolution
Explain the structure and motility of organisms in these domains
Discuss the mechanisms of reproduction of bacteria
Discuss the roles bacteria and archea play in the environment
Discuss biotechnological applications of organisms in these domains

10. Identify characteristics of organisms in the kingdom Protista

Learning Objectives
Discuss the evolution and relationships of protists
Explain nutritional and defensive adaptions of protists

Identify reproduction adaptions amongst protists

11. Identify distinctive characteristics of members of the kingdom Fungi

Learning Objectives

Compare and contrast sexual and asexual reproduction in fungi
Describe the role fungi play in the environment and biotechnological applications
Explain the evolution and diversity of fungi

12. Describe characteristics of organisms in the kingdom Plantae

Learning Objectives

Discuss the ancestry and diversity of modern plants
Explain the diverse methods of reproduction in plants and identify reproductive stages
Identify characteristics of gymnosperm and angiosperm
Characterize plants as gymnosperm and angiosperm

13. Identify characteristics of seedless plants, seed plants and flowering plants

Learning Objectives

Discuss reproduction and growth
Identify plants in each category

14. Describe characteristics of organisms in the kingdom Animalia

Learning Objectives

Identify characteristics common to all members of the kingdom Animalia
Describe characteristics of invertebrates
Identify organisms that are invertebrates
Describe characteristics of vertebrates
Identify organisms that are vertebrates

15. Define Ecology

Learning Objectives

Discuss biotic and abiotic factors
Identify how environment and climate affect ecology
Define and describe biomes

16. Discuss behavioral ecology

Learning Objectives

Describe Foraging behavior
Explain how organisms within a group communicate with each other
Discuss altruism
Discuss the impact of genetics and learning on behavior
Explain what is involved in movement and migration

17. Describe population ecology

Learning Objectives

Differentiate between exponential and logistic growth
Distinguish between density dependent and density independent factors
Discuss human population growth on a global scale
Discuss the intraspecific interactions

18. Describe community ecology

Learning Objectives

Discuss differing views of communities
Identify patterns of species richness
Explain how species richness can contribute to community stability
Discuss interspecific interactions

19. Describe Ecosystems ecology

Learning Objectives

Discuss food webs and energy flow
Explain how energy is produced in ecosystems
Discuss biogeochemical cycles

20. Develop an appreciation for biodiversity

Learning Objectives
Explain the importance of conserving of biodiversity
List the causes of extinction and loss of biodiversity
Provide examples of conservation strategies

21. 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

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.