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 archaea 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
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

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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.

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