

**Course Prefix and Number:** SCI156

**Course Title:** Integrated Sci II w/Lab: SC1

**Course Credits:** 4

**Course Description:** Examines earth and biological systems, living and non-living environments, through the application of fundamental energy and matter concepts. These systems and concepts will be explored in hands-on laboratory experiments. This is a statewide Guaranteed Transfer course in the GT-SC1 category.

**Guaranteed Transfer (GT) Pathways Course Statement:**

The Colorado Commission on Higher Education has approved SCI156 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT- SC1 category. For transferring students, successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to <https://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html>.

**GT-SC1: NATURAL & PHYSICAL SCIENCES CONTENT CRITERIA**

Students should be able to:

1. The lecture content of a GT Pathways science course (GT-SC1):
  - a. Develop foundational knowledge in specific field(s) of science.
  - b. Develop an understanding of the nature and process of science.
  - c. Demonstrate the ability to use scientific methodologies.
  - d. Examine quantitative approaches to study natural phenomena.
  
2. The laboratory (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a GT Pathways science course (GT-SC1):
  - a. Perform hands-on activities with demonstration and simulation components playing a secondary role.
  - b. Engage in inquiry-based activities.
  - c. Demonstrate the ability to use the scientific method.
  - d. Obtain and interpret data, and communicate the results of inquiry.
  - e. Demonstrate proper technique and safe practices.

**GT-SC1 COMPETENCIES & STUDENT LEARNING OUTCOMES**

**Competency: Inquiry & Analysis:**

Students should be able to:

4. **Select or Develop a Design Process**
  - a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.
  
5. **Analyze and Interpret Evidence**
  - a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.
  - b. Utilize multiple representations to interpret the data.
  
6. **Draw Conclusions**
  - a. State a conclusion based on findings.

**Competency: Quantitative Literacy:**

Students should be able to:

1. Interpret Information
  - a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
2. Represent Information
  - a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

**REQUIRED COURSE LEARNING OUTCOMES**

1. Use appropriate tools and techniques to gather, process, and analyze data and to report information related to a scientific investigation.
2. Measure quantities in standard metric units.
3. Compare the scale and composition of the planets in the solar system.
4. Describe the effect of gravity on the motions of the solar system.
5. Discuss the transfer of energy in Earth systems.
6. Analyze the structure of, and changes in, the atmosphere, and its significance for life on Earth.
7. Explain water and other chemical cycles in Earth systems.
8. Explain and analyze general weather patterns by collecting, plotting, and interpreting data
9. Describe how energy transfer within the atmosphere influences weather
10. Investigate and explain the occurrence and effects of storms on human populations.
11. Differentiate global biomes by their physical data.
12. Describe the theory of plate tectonics and its affect on the planet.
13. Describe the composition and structure of Earth's interior.
14. Describe the rock cycle.
15. Describe the observable components and functions of a cell.
16. Compare and contrast the processes of photosynthesis and respiration.
17. Describe human body systems and their structures and functions.
18. Explain how environmental changes impact the survival of species.
19. Explain how biodiversity and other factors influence ecosystems.
20. Use physical data to demonstrate that climate varies over space and time through both natural and human-made processes.

**REQUIRED TOPICAL OUTLINE**

- I. You are here-the earth system in the universe; overview of systems
  - a. Planetary system development
  - b. Properties of the solar system
  - c. Systems thinking
- II. Energy in the earth system - atmosphere
  - a. Radiative transfer
  - b. Composition of the atmosphere
  - c. Weather and climate
- III. Energy in the earth system - lithosphere
  - a. Plate tectonics
  - b. Rocks and minerals
  - c. Earth surface processes
  - d. Natural hazards

- IV. Energy in the earth system - biosphere
  - a. Characteristics of life
  - b. Respiration and photosynthesis
  - c. Genetics
  - d. Evolution of life
  - e. Diversity of life
  - f. Human biology and systems
- V. The Earth as a system - intersection of biosphere, atmosphere, and lithosphere
  - a. Ecology
  - b. Energy flow in ecosystems
  - c. Climate change and earth systems
- VI. The search for water and life in the solar system

Effective Implementation date: Spring 2018, 201830