

ESCI 0010L - INTRODUCTION TO EARTH SCIENCE LABORATORY

Catalog Description

Prerequisite: Completion with grade of "C" or better or concurrent enrollment in ESCI 10

Hours: 54 laboratory

Description: Exploration of the solid Earth, its atmosphere, hydrosphere, and place in the solar system. Learning through investigation and systematic laboratory procedures, focused on the physical and chemical systems of the Earth such as the tectonic cycle, rock cycle, hydrologic cycle, weather and climate. Field trip(s) may be required during regular lab time. (C-ID GEOL 120L) (CSU, UC)

Course Student Learning Outcomes

- CSLO #1: Identify and classify basic rocks and minerals.
- CSLO #2: Interpret topographic maps.
- CSLO #3: Use appropriate instrumentation to measure atmospheric characteristics.

Effective Term

Fall 2018

Course Type

Credit - Degree-applicable

Contact Hours

54

Outside of Class Hours

0

Total Student Learning Hours

54

Course Objectives

Students will, through laboratory exercises and written reports:

1. identify basic earth materials (water, minerals, rocks, air) and describe their physical properties;
2. classify rocks and minerals with the use of a key and laboratory procedures;
3. apply the concepts and principles of Earth's systems, including the Hydrologic Cycle, the Rock Cycle, the Plate Tectonics Cycle, and Geologic Time;
4. compare and contrast the range of time scales on the Earth, from rapid atmospheric events to the slow motion of plates;
5. trace the transfer of energy through Earth systems, and describe the energy sources behind storms, ocean currents, erosion, earthquakes, and volcanic activity;
6. describe the motions of the Earth, Moon and Sun through space and relate it to observations we can make from the Earth;

7. compare the planets of our solar system and predict what planets in other star systems might be like;
8. analyze the complexity of interactions between Earth systems, and explain the potential causes of observed changes in Earth's atmosphere and oceans over both geologic and historical time; and
9. construct a scientific explanation to evaluate evidence and draw conclusions on the basis of given or collected data, based on the scientific method.

General Education Information

- Approved College Associate Degree GE Applicability
 - AA/AS - Physical Sciences
 - AS - Physical Science Lab
- CSU GE Applicability (Recommended-requires CSU approval)
 - CSUGE - B3 Lab Activity
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)
 - IGETC - 5C Laboratory Science

Articulation Information

- CSU Transferable
- UC Transferable

Methods of Evaluation

- Objective Examinations
 - Example: Example: compare and contrast samples A and B (A and B being gypsum and muscovite). Answer will be graded based upon accuracy and development of comparison and contrast.
- Problem Solving Examinations
 - Example: Example: hand-draw cross sections of valleys from topographic maps to determine their origin (e.g. fluvial vs. glacial). Students will receive examples of maps as preparation for their own work and a rubric for grading the maps.

Repeatable

No

Methods of Instruction

- Laboratory
- Distance Learning

Lab:

1. Instructor will show how to read a temperature-density-salinity chart, and guide the class through one example, after which students will work in groups on a few other examples, supervised by the instructor.
2. Instructor will model how to obtain a record of physical properties from a mineral sample, after which students will be guided through the collection of physical properties from other mineral samples.

Distance Learning

1. Faculty record videos demonstrating volcanic hazards (such as wind direction and speed and ash distribution) associated with eruption events and students complete written exercises modeling ash fall patterns from Cascadian volcanic eruptions and where it is safer to live.

Typical Out of Class Assignments

Reading Assignments

1. Read assigned pages in the lecture textbook to become familiar with the concepts that will be applied during lab exercises, such as those that relate to minerals. 2. Read additional handouts provided in preparation for lab work, such as one on the specifics of the area to be visited locally to explore our geologic history.

Writing, Problem Solving or Performance

1. Describe the physical properties of a mineral sample such as calcite.
2. Develop charts and graphs from data provided, such as for annual mineral production in the United States.

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Applications and Investigations in Earth Science
 - Author: Tarbuck, Lutgens, Tasa and Pinzke
 - Publisher: Prentice Hall
 - Publication Date: 2014
 - Text Edition: 8th
 - Classic Textbook?:
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.