

Prepared by the Department of Natural Sciences & Applied Technology

Date of Departmental Approval: February 15, 2017

Date Approved by Curriculum and Programs: February 22, 2017

Effective: Fall 2017

1. Course Number: ESC101 / ESC101L

Course Title: Introduction to Earth Science / Introduction to Earth Science Laboratory

2. Description: This is a one-semester, liberal arts and sciences course, with a laboratory, designed to introduce the concept that planet Earth represents a dynamic, integrated system. The nature and characteristics of the atmosphere, lithosphere, hydrosphere, and biosphere are considered. (3 class hours / 2 laboratory hours)

3. Student Learning Outcomes: (instructional objectives, intellectual skills):

Upon successful completion of this introductory course, students are able to do the following:

- Describe the dynamic nature of planet Earth and the field of Earth Science;
- Identify and evaluate many processes which have occurred throughout Earth's complex history;
- Appraise the various sciences which seek to understand the Earth;
- Evaluate key sciences such as geology, oceanography and meteorology;
- Manage hands-on experimentation in a laboratory setting;
- Interpret and explain the interaction between the Earth's four spheres;
- Classify the Earth as a complex system with interacting parts;
- Appraise and investigate through scientific inquiry using the scientific method;
- Compare and contrast the differences between minerals and rocks;
- Measure and analyze the effects of moving water;
- Describe and assess the glacial processes that created Cape Cod;
- Summarize and give examples of the processes of the Theory of Plate Tectonics;
- Differentiate between the various types of volcanoes;
- Evaluate and explain geologic structures and how they are formed;
- Translate geologic time and recognize the importance of fossils;
- Report on the complexities of the oceans and their shorelines; and
- Contrast the concepts of weather and climate, including severe weather.
- Use appropriate techniques in the laboratory, collect and analyze meaningful data, and present clearly and cogently written laboratory results (utilizing Standard American English).
- Work cooperatively in a small group setting to complete various laboratory exercises, following the written instructions provided.
- Explain some of the ways in which knowledge of Earth Science can be applied to the problems of society in general.
- Effectively utilize appropriate quantities and units to describe physical phenomena.
- Use a variety of devices and instruments in taking laboratory measurements.
- Use word processing and spreadsheet software to prepare and present laboratory reports.

4. Credits: 4 credits

5. Satisfies General Education Requirement: Natural or Physical Science

6. Prerequisites: MAT030 (Elementary Algebra) or MAT035 (Algebra for Non-STEM) or satisfactory basic skills assessment scores or **co-requisite:** ENL101 (English Composition I)

7. Semesters Offered: Fall, Spring

8. Suggested General Guidelines for Evaluation: Grades will be based on the evaluations of quizzes, essays, one-hour exams, laboratory work and reports, and a research paper. Considerable attention is paid to the continued development of intellectual skills commensurate with higher education: written and oral communication; logic; reasoning and critical thought; application of scientific methods; and a consideration of values. All written work is expected to conform to the Writing Standard set forth in the Student Handbook and should express analytical and synthetic thought. Classroom participation is expected, encouraged and is intended to involve the student in an active exchange of ideas, to give voice to thought.

9. General Topical Outline:

ESC101. Introduction to Earth Science - Course Outline

Introduction to Earth Science
Minerals: Building Blocks of Rocks
Rocks: Materials of the Lithosphere
Landscapes Fashioned By Water
Glacial and Arid Landscapes
Plate Tectonics
Restless Earth: Earthquakes – Mountain Building
Fires Within: Igneous Activity
Geologic Time
Oceans: The Last Frontier, The Restless Ocean
The Atmosphere: Heating the Atmosphere
Clouds and Precipitation
The Atmosphere in Motion
Weather Patterns and Severe Weather