

# ESCI-103L: EARTH LABORATORY

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## Cuyahoga Community College

### Viewing: ESCI-103L : Earth Laboratory

**Board of Trustees:**

2015-05-28

**Academic Term:**

Fall 2021

**Subject Code**

ESCI - Earth Science

**Course Number:**

103L

**Title:**

Earth Laboratory

**Catalog Description:**

Intended for non-science majors. Exercises on rocks and minerals, soils, weather, plate tectonics, energy and may include other related earth science activities. Laboratory activities complement and enrich related lecture course.

**Credit Hour(s):**

1

**Lecture Hour(s):**

0

**Lab Hour(s):**

3

**Other Hour(s):**

0

## Requisites

**Prerequisite and Corequisite**

ESCI-1030 Survey of Earth or concurrent enrollment.

## Outcomes

**Course Outcome(s):**

Apply hands-on laboratory techniques and safety measures in daily life.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

**Objective(s):**

1. Demonstrate familiarity with common laboratory measuring devices.
2. Explain the degree of uncertainty associated with scientific data collection.
3. Employ safety procedures and techniques to all work performed in the laboratory and employ these procedures.

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**Course Outcome(s):**

Apply laboratory knowledge to studies of the environment.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

**Objective(s):**

1. Identify and list geologic hazards and state the probable effects of these hazards in regions prone to earthquakes.
  2. Identify and list evidence which is used to support tectonic activity on our planet.
  3. Measure, collect, graph, and interpret scientific data and write reports.
  4. Discuss current science, technology, and societal issues.
  5. Identify common natural resources.
  6. Identify and compare divergent, convergent, and transform plate boundaries.
  7. Explain the relationship between plate boundaries, volcanism, and seismic activity on earth.
  8. Explain why volcanoes vary in structure, composition, location, eruption, and size.
  9. List some of the properties geologists use to identify minerals and rocks and perform mineral and rock identification analysis.
  10. Explain the relationship between earthquakes and plate boundaries.
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**Methods of Evaluation:**

1. Unit examinations and/or quizzes
2. Written library research reports
3. Individual class presentations
4. Cooperative class projects
5. Homework assignments
6. Student/faculty contractual agreements
7. Computer assignments/games/simulations
8. Field trip activities/assignments
9. Laboratory reports
10. Other or some combination of the above

**Course Content Outline:**

1. Safety in the laboratory
  - a. Student responsibilities
    - i. appropriate eye and body protection
    - ii. no unauthorized experiments
    - iii. knowledge of safety policy and procedures
    - iv. laboratory techniques
  - b. Physical facilities
    - i. first-aid: eye washes, burns, etc.
    - ii. fire extinguishers and fire blanket
    - iii. electrical power and circuit breakers
    - iv. emergency exits
  - c. Types of avoidable accidents
    - i. chemical spills
    - ii. injuries caused by broken glassware
    - iii. careless behavior in the laboratory
    - iv. eye injuries
    - v. exposure to vapors or gases
2. Measurements in the laboratory
  - a. Mass (weight)
    - i. balances
      1. analytical
      2. top loader
    - ii. weighing techniques
      1. taring
      2. significant numbers
  - b. Volume
  - c. Other metric quantities
3. Minerals and rocks
  - a. Minerals
    - i. properties
    - ii. identification

- iii. classification
      - 1. silicate
      - 2. nonsilicate
  - b. Rocks
    - i. classification
      - 1. igneous
      - 2. sedimentary
      - 3. metamorphic
    - ii. identification
- 4. Analysis of soil
  - a. Acidity
  - b. Composition
    - i. nitrogen
    - ii. phosphorus
    - iii. potassium
    - iv. other components
- 5. Plate tectonics, volcanism, and earthquakes
  - a. Earthquakes
    - i. location, intensity, and magnitude
    - ii. hazards and effects
  - b. Plate boundaries
    - i. divergent
    - ii. convergent
    - iii. transform
  - c. Volcanism
    - i. location
    - ii. composition
    - iii. structure
- 6. Elements of weather
  - a. Basic elements of weather
    - i. humidity
    - ii. pressure
    - iii. temperature
    - iv. winds
    - v. other
  - b. Moisture
    - i. humidity
    - ii. relative humidity
      - 1. instruments
      - 2. measurement
  - c. Pressure and winds
    - i. isobars
    - ii. weather maps
- 7. Energy and environmental issues
  - a. Energy alternatives and conservation
  - b. Weather forecasts
  - c. Radioactivity
  - d. Nature of energy
  - e. Current science, technology, and society issues

## Resources

Tarbuck, Edward J. *Applications and Investigations in Earth Science*. 7th. Upper Saddle River, NJ: Pearson, 2011.

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Shipman, James T., Wilson, Jerry D., Higgins, Charles A. *Laboratory Guide for Introduction to Physical Science*. 13th. Belmont, CA: Cengage, 2012.

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Staglian. *Physical Science Lab Exercises*. {ts '2010-09-01 00:00:00'}.

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"Scientific American"

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"Ohio Magazine"

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"Smithsonian"

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"Science"

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"Science News"

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"Geology"

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"Environment"

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**Resources Other**

1. Audio-visual materials: slides, videos, audio tapes and computer programs.
2. Faculty developed instructional materials.
3. Internet Resources.

**Instructional Services**

**OAN Number:**

Ohio Transfer 36 TMNS

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