ESCI-1030: EARTH

Cuyahoga Community College

Viewing: ESCI-1030 : Earth

Board of Trustees:
2015-05-28

Academic Term:
Fall 2021

Subject Code
ESCI - Earth Science

Course Number:
1030

Title:
Earth

Catalog Description:
Survey of geology of Earth and its impact on the environment. Earth's structure and composition, earthquakes, plate tectonics, hydrologic cycle, weather, resources and energy alternatives, and current related issues. Intended for non-science majors. To fulfill laboratory science requirements, students should enroll in related laboratory course.

Credit Hour(s):
3

Lecture Hour(s):
3

Lab Hour(s):
0

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
ENG-0985 Introduction to College Literacies or appropriate score on English Placement Test.
Note: ENG-0980 Language Fundamentals I taken prior to Fall 2021 will also meet prerequisite requirements.

Outcomes

Course Outcome(s):
Apply the concepts of physical geology to gain a better understanding of the earth.

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.

Objective(s):
1. Explain the atomic structure of minerals and know of their occurrences and economic uses.
2. Describe the formation of, locations of, and structures of igneous, sedimentary, and metamorphic rocks and the methods used to identifying them.
3. Explain development of major landforms and recognize and discuss the actions and interactions of gravity, water, ice, and wind on the earth's surface.
4. List valuable geologic resources, their distributions, methods of extraction, and uses.
5. Recognize and measure geological features in the field.
6. Differentiate between chemical and physical weathering and explain the different processes of each of these.

Course Outcome(s):

Apply the concepts of physical geology to currents events and scientific studies of the earth.

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.

Objective(s):

1. Describe the various types of mass wasting.
2. Differentiate between erosional and depositional processes and features of gravity, water, wind and ice.
3. Differentiate between P, S, and L seismic waves and explain how they are measured and their implications.
4. Describe the features of the ocean floor and how they change over time.
5. Differentiate between plate tectonics and continental drift theories.
6. Locate plate boundaries and identify the plates and the types of boundaries that separate them.
7. Explain different methods of mountain formation.
8. List the components and dates of the geologic column.
9. Explain relative and absolute dating and the methods used in both processes.

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. Other or some combination of the above

Course Content Outline:

1. Introduction to minerals and rocks
    a. Minerals
        i. Structure
        ii. Properties
            1. Physical
            2. Chemical
        iii. Classification
            1. Silicate
            2. Nonsilicate
    b. Rocks
        i. Rock cycle
        ii. Classification
            1. Igneous
            2. Sedimentary
            3. Metamorphic
    c. Reources from rocks and minerals
2. Weathering, soil, and mass wasting
    a. Weathering
        i. Mechanical
        ii. Chemical
    b. Soil
        i. Texture and structure
        ii. Soil formation
            1. Controls
            2. Profile
            3. Classification
    c. Mass wasting
        i. Controls
        ii. Processes
3. Hydrologic cycle and its effects

a. Hydrologic cycle
b. Streams
    i. Erosion
    ii. Transportation
    iii. Deposition
c. Groundwater
    i. Springs
    ii. Wells
    iii. Environmental concerns

4. Earth"s structure and phenomena
    a. Earthquakes
        i. Location, intensity, and magnitude
        ii. Destruction
        iii. Prediction and possible control
    b. Earth"s interior
        i. Mapping
        ii. Composition
5. Plate tectonics theory
    a. Continental drift theory
        i. History
        ii. Evidence
    b. Plate boundaries
        i. Divergent
        ii. Convergent
        iii. Transform
    c. Modern scientific evidence
        i. Paleomagnetism
        ii. Seismic activity
        iii. Volcanism
6. Volcanism of the earth
    a. Nature and composition
        i. Magma
        ii. Lava
    b. Types and characteristics of volcanoes
        i. Shield
        ii. Cinder cone
        iii. Composite cone
    c. Intrusive igneous rock formation
7. Components of the atmosphere and weather
    a. Structure
    b. Composition
    c. Temperature
    d. Moisture
        i. Humidity
        ii. Clouds
        iii. Precipitation
    e. Pressure and winds
        i. Cyclones
        ii. Anticyclones
    f. Weather patterns
        i. Air masses
        ii. Fronts
            1. Cold
            2. Warm
            3. Occluded
    g. Storms
        i. Thunderstorms
        ii. Tornadoes
        iii. Hurricanes
8. Energy and energy alternatives

a. Energy, work power, and efficiency
b. Temperature and heat engines
c. Energy consumption, alternatives, and conservation
d. Weather forecasts
e. Current science, technology, and society issues

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Resources

Tarbuck, Edward J., Lutgens, Frederick K., Tasa, Dennis. *Earth Science.* 13th ed. Upper Saddle, NJ: Pearson, 2012.

Merali, Zeeya, Skinner, Brian J. *Visualizing Earth Science.* 1st. Hoboken, NJ: Wiley and Sons, 2009.

McConnell, David, Steer, David. *The Good Earth: Introduction to Earth Science.* 3rd. Chicago, IL; McGraw-Hill, 2014.

"Ohio Magazine"

"Scientific American"

"Smithsonian"

"Science"

"Science News"

"Geology"

"Environment"

Resources Other

1. Audio-visual materials; slides, videos, audio tapes, and computer programs.
2. Faculty developed instructional materials.

Instructional Services

OAN Number:
Ohio Transfer 36 TMNS

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