

CUMBERLAND COUNTY COLLEGE

Course: GL 101 Physical Geology

Credits: 4

Prerequisite: EN 060 and MA-091 or MA094

Description:

Covers the nature and origin of the land and water features of the earth, including studies available concerning the oceans and their floors, with a view to providing an understanding of why our land looks as it does and the conflicts between natural change and man's use of the land and seas. Field trips may also be part of this course.

Learning Outcomes:

Upon successful completion of this course, students will be able to:

- Examine the concepts of systems and how they are used to study geologic systems.
- Objectives
- Examine the energy transfer, composition and its influence on the structure of the earth and its systems.
- Categorize earth materials based on their physical properties, method of formation and environment of formation.
- Define the hydrologic cycle and the impact water has on shaping earth's systems.
- Identify the major layers of the Earth and how the composition and structure of these layers controls major geologic processes.
- Define the structures and geologic processes that shape and form shoreline environments.
- Apply geologic processes and principles at work on the earth to other planets in the solar system.
- Interpret how large scale systems control global events.
- Examine the geologic history of New Jersey and be able to place these events in the larger global system.

General Education Outcomes

- Use the scientific method of inquiry, through the acquisition of scientific knowledge.
- Use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Topical Outline:

- Define system terminology including: compartments, internal and external variables, flow, open and closed systems.
- Discuss the limitations placed systems.
- Draw and identify the parts of a system given an ecosystem/environment.
- Define the controls on the health and stability of a system and how the health of a system is measured.
- Determine what feedback is and how negative and positive feedback affects systems.
- Describe and discuss the environmental implications of the cycles of matter and energy through the ecosystem.

- Discuss the limitations placed on living systems by energy forms and transfer methods.
- Define the basic laws of thermodynamics and how they influence geologic systems.
- Identify the basic states of matter and how energy controls the state of matter.
- Identify important earth materials such as elements, minerals, sediment and rocks using the properties and characteristics of the material.
- Classify the three major types of rocks and identify how each type is formed and the environments where they form using the concept of the rock cycle.
- Examine sedimentary environments including where they are located, the types of sediment, rocks and features associated with each and how they are recognized in the rock record.
- Diagram the hydrologic cycle and the important processes.
- Identify the basic concepts associated with groundwater including: structure, controls on groundwater movement, pollution and management.
- Summarize the relationships between the atmosphere and hydrosphere.
- Diagram the major layers of the Earth including properties and relative position.
- Compare and contrast the asthenosphere, lithosphere, oceanic crust and continental crust.
- Define plate tectonics and list the major plate types and the characters for each plate type.
- Summarize plate movement through time and how the changing lithosphere has influenced major events through time and controls the position of major geologic landforms.
- Explain what seismic energy is, how it is created and what effects it has on the upper layers of the Earth.
- Compare and contrast the main types of volcanoes and how the composition of lava controls the shape, explosiveness, and other volcanic features.
- Describe the important features found in a shoreline environment.
- Calculate and assess the physical forces that shape these environments (tidal, wave, sea level changes, etc.)
- Define mitigation and assess various mitigation for natural hazards that impact these environments.
- Compare and contrast the resources associated with these environments.
- Identify geologic structures found on other planets and moons in the solar system.
- Compare and contrast earth's features with features found on other planets and explain why there are differences and similarities.
- Develop timelines for the rates and scales of change that have occurred through Earth's history.
- Analyze climatic variations through time to determine if patterns exist.
- Determine if large scale processes such as global warming and plate tectonics promote environmental hazards and identify variables that influence changes in those systems.
- Propose mitigation methods and alternate solutions to influence the impact of changes in the environment based on past history.
- Identify local systems and resources a student living in this area will encounter.
- Describe events in New Jersey through geologic time.
- Determine what environmental hazards would impact New Jersey.
- Applying the scientific method, students will analyze a problem and draw conclusions from the data and evidence.

- Students will distinguish between scientific theory and scientific discovery, between science and its scientific technological applications, and they will explain the impact of each on society.
- Students will use computer systems and/or other appropriate forms of technology to present scientific information.
- Students will use appropriate forms of technology to identify, collect and process scientific information.
- Students will use appropriate scientific library/learning resource tools such as cataloging systems to access information in reference publications, periodicals, bibliographies and data bases.

Text:

Earth: an Introduction to Physical Geology by Tarbuck. Prentice Hall Publishing.

Academic Integrity:

Plagiarism is cheating. Plagiarism is presenting in written work, in public speaking, and in oral reports the ideas or exact words of someone else without proper documentation.

Whether the act of plagiarism is deliberate or accidental [ignorance of the proper rules for handling material is no excuse], plagiarism is, indeed, a “criminal” offense.

As such, a plagiarized paper or report automatically receives a grade of **ZERO** and the student may receive a grade of **F** for the semester at the discretion of the instructor.

Tutoring & Project Assist:

If you are having difficulty with work in this class tutoring is available through the Center for Academic & Student Success. If you think that you might have a learning disability, contact Project Assist at 856.691.8600 x 1282 for information on assistance that can be provided to eligible students.

Before Withdrawing From This Course:

If a student experiences adverse circumstances while enrolled in this course and considers withdrawing, s/he should see an advisor (division or advisement center) BEFORE withdrawing from the class. A withdrawal may cause harmful repercussions to completion rate standards and overall GPA, which can limit or eliminate future financial aid in addition to causing academic suspension.