

CUMBERLAND COUNTY COLLEGE

Course: GL 102 Historical Geology

Credits: 4

Prerequisite: EN 060 and MA 091 or MA 094

Description:

This lab science course covers the prehistoric development of the earth and living things, examines the relationships between land and sea positions and the subsequent development of life forms using physical geology concepts and the study of fossil forms, of plants and animals. Field trips may be a 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.
- Examine the energy transfer, composition and structure of the Earth and its systems.
- Gain an awareness and appreciation of the physical processes that shape the earth's atmosphere, hydrosphere, geosphere and biosphere.
- Distinguish between relative and absolute geologic time and use the principles of each type to construct a geologic history of physical and biological events.
- Examine and describe evolution and how this process has guided biologic communities through time.
- Examine the geologic history of New Jersey and be able to place these events in the larger global system.
- Interpret how large scale systems control global events.

General Education Outcomes

- Use the scientific method of inquiry, through the acquisition of scientific knowledge.
- Students will 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.
- 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.
- List trophic levels found in ecosystems and how energy transfer affects organisms at any given trophic level.
- 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.
- Illustrate the basic controls on how the atmosphere is heated and energy is transferred through the atmosphere including the steps associated with the greenhouse effect.
- Summarize the relationships between the atmosphere and hydrosphere.
- Describe the differences between relative and absolute time.
- Use relative dating principles and concepts to date geologic events.
- Reconstruct the geologic time scale using appropriate time units as well as the correct chronological order.
- Use parent/daughter concepts to calculate absolute radiometric dates.
- Define evolution and the major aspects of evolution (mutation, variation, natural selection)
- Examine the evolution and change in biological organisms and communities through time.
- 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.
- Students will recognize when scientific information is needed and be able to locate, evaluate and use information.

Text:

Wicander, R. and Monroe, J. Historical Geology: Evolution of Earth and Life Through Time. Cengage.

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.