Course Abstract

If you need accommodations due to a disability, contact Disability Services in Edison Hall Room 100, 732.906.2546.

To foster a productive learning environment, the College requires that all students adhere to the Code of Student Conduct which is published in the college catalog and website.

Course ID and Name: SCI 164 Historical Geology with Laboratory

Department: Department of Natural Sciences

Chairperson: Dr. Donna Howell
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Prerequisites: MAT 013 or appropriate score on the College Placement Test and one year of high school laboratory science

Co-requisites: None

Course Description: Historical Geology and Lab course is an introduction to the principles and interpretation of geologic history utilizing three main themes – deep time, plate tectonics, and evolution of life. It emphasizes the evolution of the earth's lithosphere (crust), atmosphere, and biosphere through geologic time. It includes consideration of the historical aspects of plate tectonics, the geologic development of the current continents configuration, and important events in biological evolution and the resulting assembly of fossils. It provides an appreciation for the vast extent of geologic time, the formation of natural resources, the natural processes affecting change on the earth, and the identification of common fossil types

General Education Status: Yes

Credits: 4 Lecture Hours: 3 Lab Hours: 2

Learning Outcomes:

1. Use scientific method to understand Natural World.
2. Investigate the field and laboratory methods used to construct the geologic time scale and clearly discuss the difference between relative and absolute dating methods.
3. List the processes that form igneous, sedimentary, and metamorphic rocks and use the rock cycle to interrelate them.
4. Describe the theory of plate tectonics
5. Compare and contrast paleoenvironments based on sedimentary structures and fossil assemblage
6. Describe the major geologic events that occurred during the Precambrian, Paleozoic, Mesozoic, and Cenozoic eras

Course Content Areas:

1. Geologic Time
   a. Explain the principles of geology used to determine the age of strata
   b. Compare the difference between relative time and absolute time
   c. Describe radiometric dating in determine the geologic ages

   d. Explain the order of the geologic timescale and geologic columns based on Eons, Eras, Periods, and Epochs
2. Minerals
   a. Define a mineral
   b. Identify the diagnostic physical properties of important minerals
   c. Explain the basic structure of an atom and the formation of compounds
   d. Describe the economic importance of minerals
   e. Explain the condition of formation of minerals
3. Rock Cycle
   a. Explain the major processes of the rock cycle
   b. Explore the processes that form the igneous, sedimentary, and metamorphic rocks and use the rock cycle to interrelate them
   c. Identify the texture and composition associated with each type of rock
   d. Identify landforms associated with the primary rock types
4. Paleo environments
   a. Describe the environmental factors that form various sediments
   b. Identify rock material with specific types of environments
   c. Interpret plate tectonic change based on observations of sedimentary rocks
5. Geologic Structures
   a. Identify dip and strike structures along outcrops in order to determine geologic structures
   b. Explain the three types of unconformities
   c. Describe the types of faults, how they form, and their relationship to plate tectonic boundaries
   d. Identify geologic structures on geologic maps
   e. Identify different physiographic provinces based on their geologic structures and rocks types
6. Plate Tectonics
   a. Explain the processes of plate motions
   b. Name and identify types of plate boundaries and their properties
   c. Describe the relationship between Plate tectonics and the Scientific Methods
   d. Identify the interior layers of the Earth Relate the effects of convection current activity in the mantle with plate tectonics
7. Fossils
   a. Explain the definition of fossil
   b. Describe the types of fossil preservation
   c. Identify index fossils
   d. Describe the evolution of various fossil types
   e. Interpret a bio stratigraphic map
8. Archean Eon
   a. Describe theories regarding the formation of the Earth
   b. Describe theories regarding the formation of the Solar System
   c. Discuss formation of terrestrial and Jovian planets
   d. Discuss the process of planetary differentiation
9. Proterozoic Eon
   a. Discuss continental configuration and water bodies
   b. Describe changes in global climate and atmosphere
   c. Describe and identify fossil
10. Phanerozoic Eon
   a. Discuss continental configuration and water bodies
   b. Describe changes in global climate and atmosphere
   c. Describe and identify fossil