COURSE OUTLINE

GEOL-118

Historical Geology Laboratory

1 Credit

Science Core Course

HOWARD COMMUNITY COLLEGE

Description

In this laboratory course, students will analyze rock and fossil data, and apply the basic principles of stratigraphy to reconstruct geologic events. Geologic maps and cross-sections illustrating the geologic provinces of North America will be interpreted. There will be several field trips to local sites. Pre- or co-requisite: GEOL-108. (3 hours lab)

Statement on General Education and Liberal Learning

A liberal education prepares students to lead ethical, productive, and creative lives and to understand how the pursuit of lifelong learning and critical thinking fosters good citizenship. General education courses form the core of a liberal education within the higher education curriculum and provide a coherent intellectual experience for all students by introducing the fundamental concepts and methods of inquiry in the areas of mathematics, the physical and natural sciences, the social sciences, the arts and the humanities, and composition. This course is part of the general education core experience at Howard Community College.

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Using hands-on analysis techniques, differentiate common rocks and minerals based on their physical properties.
2. Classify common types of sedimentary rocks and discuss why sedimentary rocks are important to Historical Geology.
3. Analyze sediment and interpret how different characteristics relate to transport and provenance of sediment.
4. Recognize common primary sedimentary structures in hand specimens or in photographs/slides, and interpret their origin.
5. Relate the concepts of global Plate Tectonics to the Rock Cycle and geologic structures.
6. Recognize the types of plate boundaries and explain their relationship to geologic history.
7. Describe how the principles of correlation apply to units shown on geologic cross-sections and be able to interpret the relative ages of various geologic features in a geologic cross-section.
8. Working in cooperative groups, draw a stratigraphic section given written data on rock types, sequences and thickness, using standard lithologic symbols.
9. Interpret geologic maps in order to determine past environments and processes leading to the present.
10. Identify unconformities in cross-sections and maps.
11. Apply the basic units of lithostratigraphy and biostatigraphy, using worldwide examples.
12. Distinguish and apply relative and absolute time data.
13. Recognize and describe the major types of fossil preservation.
14. Identify and classify the common microfossil groups using the microscope.
15. Distinguish the characteristics of microfossils that cause them to be global index fossils.

16. Compare the various types of trace fossils.
17. Identify common invertebrate macrofossil groups in hand specimen, and from photographs/slides.
18. Working with a lab partner, compose several classification schemes, and name the phylum, class, order, etc., for the various fossils studied in lab.
19. Interpret the paleoenvironment of common fossils, and use with sedimentary facies data to interpret paleoclimatic change throughout geologic time.

Major Topics

I. The Rock Cycle
II. Sedimentary Rocks and Structures
III. Paleosedimentary Environments
IV. Plate Tectonics
V. Lithostratigraphy and Biostratigraphy
VI. Geologic Maps
VII. Relative Time and Absolute Time
VIII. Fossil Preservation and Taphonomy
IX. Microfossils
X. Early Paleozoic Life
XI. Later Paleozoic Life
XII. Mesozoic Life
XIII. Cenozoic Life
XIV. Paleoecology and Paleoclimatology

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but will be calculated on the basis of field trip reports, laboratory reports, quizzes, lab practicals, and exams.

Writing: Individual written lab reports.

Other Course Information

This course, together with GEOL-108, is a Science core course. This course is a Science elective and an Arts and Sciences elective.