

# North Hennepin Community College

## NSCI 1140: Historical Geology

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 3

Lab Hours/Week: 3

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: Goal 03 - Natural Science, Goal 10 - People/Environment

A temporal survey of the development of Earth as we know it today, and the evolution of life as deciphered from the sedimentary rock and fossil record. By using the process of science to examine how the Earth and life have changed through the geologic past we can begin to get a glimpse into the effect which humans may have on it now and in the future. Topics include: principles of geology, sedimentary rocks, fossil identification and classification, plate tectonics, sea level change, geologic time, topographic and geologic maps, evolution of life, climate change, hominid development and mass extinctions. Course is open to all students. (3 hours lecture, 3 hours lab) 4 credits

**B. COURSE EFFECTIVE DATES:** 07/20/2016 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Students will be introduced to and work with the tools that geoscientists have used in their scientific practice to unravel our understanding of Earth's history and the history of life.
2. In addition to the topics of origin & evolution of the solar system, earth and life, students will be introduced to and practice using the scientific process as well as basic geologic concepts and content such as plate tectonics, rock and mineral identification, geologic time, sedimentary environments and stratigraphy, taxonomy and classification, sea level and climate change, fossils and fossil preservation to examine the development of and critique evidence associated with scientific ideas and issues in our understanding of Earth's history and the evolution of life

#### **D. LEARNING OUTCOMES (General)**

1. describe and practice using the scientific method; explain what science is, how it works and the role of science in society; and discriminate/recognize science from pseudoscience by evaluating examples of each (MnTC G-3a;NHCC ELO #1, 2)
2. practice making observations, formulating scientific questions, developing hypotheses and means to test them, and predict outcomes related to their hypotheses (MnTC G-3a,b,c; NHCC ELO #1, 2)
3. describe/explain, using words and pictures: a) commonly accepted theories such as plate tectonics and organic evolution, b) controversial hypotheses and theories such as, but not limited to, causes of dinosaur extinction, snowball earth/icehouse-greenhouse hypotheses, and c) the data/observations/evidence scientists use to support or refute such (MnTC G-3a,c,d; MnTC G-10a,b,d; NHCC ELO #1, 2)
4. explain and apply, using words, graphs and pictures, basic geologic principles used in examining geologic data and solving geologic problems (MnTC G-3a,c; NHCC ELO #1, 2)
5. explain the concept of cyclicity and be able to discern various interactions within and between earth systems and their influences on the past, present and future evolution of earth, life and mechanisms of climate change (MnTC G-3a,c,d; MnTC G-10a,b,d,e,f; NHCC ELO #1, 2)
6. describe the major tenets of organic evolution, natural selection, and speciation and be able to, recognize and interpret the evidence associated with them as seen in the fossil record throughout earth history (MnTC G-3a,c,d;NHCC ELO #1, 2)
7. discuss the significance of geologic time, the geologic time scale and the methods with which it was created, how geologists determine the ages of rock layers and the geologic events they represent by applying the techniques used to examine the evidence of the temporal and spatial distribution of life in the fossil record (MnTC G-3a,c,d;NHCC ELO #1, 2)
8. demonstrate the use of classification; with emphasis on: a) the relationship between rock classification schemes, the origin of various rocks and plate tectonic theory; and b) on the classification and identification of organisms to identify fossils in the rock record and how they reveal and have influenced our understanding of the origin and evolution of life on earth (MnTC G-3a,c; NHCC ELO #1, 2)
9. recognize, describe and interpret in words and/or pictures, significant geologic, paleoenvironmental and paleobiologic changes and events and time periods throughout earth history in order to better evaluate significance of present-day same (MnTC G-3a,c,d; MnTC G-10a,b,d,e,f; NHCC ELO #1, 2)
10. recognize and interpret patterns in geologic information/data/observations from the rock and fossil record and relate these patterns to past, present and future geologic processes and features as well as paleoenvironmental and paleobiologic changes and events (MnTC G-3 a,c,d; MnTC G-10a,b,d,e,f; NHCC ELO #1, 2)
11. use comprehension skills such as translation, interpretation and extrapolation to interpret past and present geologic data presented in written, graphic or pictorial form (MnTC G-3a,c,d; MnTC G-10a,b,d,e,f; NHCC ELO #1, 2)

## **E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

### Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

### Goal 10 - People/Environment

1. Explain the basic structure and function of various natural ecosystems and of human adaptive strategies within those systems.
2. Discern patterns and interrelationships of bio-physical and socio-cultural systems.
3. Describe the basic institutional arrangements (social, legal, political, economic, religious) that are evolving to deal with environmental and natural resource challenges.
4. Evaluate critically environmental and natural resource issues in light of understandings about interrelationships, ecosystems, and institutions.
5. Propose and assess alternative solutions to environmental problems.
6. Articulate and defend the actions they would take on various environmental issues.

## **F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

## **G. SPECIAL INFORMATION**

1. Knowledge of Human Cultures and the Physical and Natural World --Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills - Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.