

Effective Implementation date: Spring 2018, 201830

Required Syllabus Information – all must be included in the course syllabus

### **GEY 112**

**Course Title:** Historical Geology w/Lab: SC1

**Course Credits:** 4

**Course Description:** Covers the development of Earth through the vast span of geologic time. Emphasis is on the investigation and interpretation of sedimentary rocks and features, the record of ancient environments, fossil life forms, and physical events in Earth's history within the framework of plate tectonics. This course includes laboratory experience.

### **GT Pathways Requirements:**

#### **Guaranteed Transfer (GT) Pathways Course Statement:**

The Colorado Commission on Higher Education has approved GEY 112 for inclusion in the Guaranteed Transfer (GT) Pathways program in the GT- SC1 category. For transferring students, successful completion with a minimum C– grade guarantees transfer and application of credit in this GT Pathways category. For more information on the GT Pathways program, go to <http://highered.colorado.gov/academics/transfers/gtpathways/curriculum.html>.

### **NATURAL & PHYSICAL SCIENCES (N&PS) CONTENT CRITERIA – GT-SC1**

1. The lecture content of a GT Pathways science course (GT-SC1)
  - a. Develop foundational knowledge in specific field(s) of science.
  - b. Develop an understanding of the nature and process of science.
  - c. Demonstrate the ability to use scientific methodologies.
  - d. Examine quantitative approaches to study natural phenomena.
2. The laboratory (either a combined lecture and laboratory, or a separate laboratory tied to a science lecture course) content of a GT Pathways science course (GT-SC1)
  - a. Perform hands-on activities with demonstration and simulation components playing a secondary role.
  - b. Engage in inquiry-based activities.
  - c. Demonstrate the ability to use the scientific method.
  - d. Obtain and interpret data, and communicate the results of inquiry.
  - e. Demonstrate proper technique and safe practices.

### **COMPETENCIES & STUDENT LEARNING OUTCOMES FOR GT-SC1**

#### **Inquiry & Analysis:**

4. **Select or Develop a Design Process**
  - a. Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.
5. **Analyze and Interpret Evidence**

- a. Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.
  - b. Utilize multiple representations to interpret the data.
- 6. Draw Conclusions**
- a. State a conclusion based on findings.

**Quantitative Literacy:**

- 1. Interpret Information
  - a. Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
- 2. Represent Information
  - a. Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

**SYSTEM REQUIREMENTS:**

**REQUIRED COURSE LEARNING OUTCOMES**

- 1. Analyze sediments and identify sedimentary rocks based on their notable characteristics.
- 2. Reconstruct paleo-environment - including paleoclimate, paleogeography, plate setting, and agent of erosion - from the analysis of sedimentary rocks and structures.
- 3. Interpret modern and ancient depositional settings through the analysis of sediments, sedimentary rocks, and sedimentary structures.
- 4. Recognize the vastness of geologic time and apply the techniques of relative and absolute dating.
- 5. List the major divisions of the geologic time scale.
- 6. Interpret and correlate geologic events and features by means of stratigraphic analysis, including the use of geologic maps and stratigraphic sections.
- 7. Describe and discuss how fossils form and how they are used as indicators of relative age and ancient environments.
- 8. Recognize the major fossil groups.
- 9. Describe and discuss the theory of evolution and correlate major events in the history of life with the geologic events occurring at that time.
- 10. Identify the major developments in the history of geologic thought.
- 11. Explain Plate Tectonics Theory.
- 12. Describe and discuss current research on the origin and development of the Earth, geosphere, hydrosphere, and atmosphere.
- 13. Delineate major geologic events during the Hadean, Archean, and Proterozoic Eons and the Paleozoic, Mesozoic, and Cenozoic Eras with emphasis on what is now North America.
- 14. Relate Earth's features and history to the theory of Plate Tectonics.
- 15. Describe Earth's major mass extinctions and lines of evidence for their causes.
- 16. Demonstrate an understanding of how climate has changed throughout Earth's history and the evidence for these changes (e.g. stable isotopes).

**RECOMMENDED COURSE LEARNING OUTCOMES**

- 1. Describe the major geochemical cycles and their use in determining past conditions and events.

2. Demonstrate an understanding of human evolution as it relates to the geologic record.

### **REQUIRED TOPICAL OUTLINE**

The required topical outline information **MUST** be included in the syllabi. It may be incorporated using one of the following variations: copying the topical outline as written below, integrating the topics within the assignment schedule, or listing the topics to be covered.

- I. Reading Earth History from sedimentary features
  - a. Sediments
  - b. Sedimentary rocks
  - c. Sedimentary structures
  - d. Weathering and erosion
  - e. Interpreting Paleo-environments
  - f. Modern and ancient depositional settings
- II. Geologic time
  - a. Deep time
  - b. Relative age dating
  - c. Absolute age dating
  - d. The geologic time scale
  - e. Evidence for age of the Earth
- III. Stratigraphy
  - a. Stratigraphic units
  - b. Horizontal and vertical relationships
  - c. Stratigraphic sections and geologic maps
  - d. Principles of Correlation
- IV. Fossils and fossilization
  - a. Importance of fossils
  - b. Methods of preservation
  - c. Classification
  - d. Identification
- V. Evolution
  - a. Fossil succession
  - b. Evidence
- VI. History of geologic thought
- VII. Plate tectonics
- VIII. Origins
  - a. Earth
  - b. Geosphere
  - c. Hydrosphere
  - d. Atmosphere
- IX. Hadean and Archean eons
  - a. Development of the continents
  - b. Development of the atmosphere and hydrosphere
  - c. Development of life
- X. Proterozoic Eon
  - a. Geologic events

- b. Plate tectonics
  - c. Proterozoic life
  - d. Extinctions
  - e. Climate
- XI. Paleozoic Era
  - a. Geologic events
  - b. Plate tectonics
  - c. Paleozoic life
  - d. Extinctions
  - e. Climate
- XII. Mesozoic Era
  - a. Geologic events
  - b. Plate tectonics
  - c. Mesozoic life
  - d. Extinctions
  - e. Climate
- XIII. Cenozoic Era
  - a. Geologic events
  - b. Plate tectonics
  - c. Cenozoic life
  - d. Extinctions
  - e. Climate

#### **RECOMMENDED TOPICAL OUTLINE**

- I. Geochemical cycles
- II. Human evolution

Syllabi requirements, including legal compliance information must be included. Individual College syllabi guidelines may include additional information. Please contact your VPI/CAO for specific College requirements.