



GEO 1220

Division: Natural Science and Mathematics

Department: Geology

Course: GEO 1220

Title: Historical Geology

Catalog Description:

This course is an introduction to the principles involved in deciphering the earth's past including the study of fossils. It will also cover the major physical and biological events in the earth's history. This course is designed for geology majors. A field trip will be required.

General Education Requirements: N/A

Semesters Offered: Spring

Credit/Time Requirement: Credit: 3; Lecture: 3; Lab: 0

Clock/Hour Requirements: 0

Offered for Non-Credit: No

Prerequisites: GEO 1110 or 1010, ENGL 1010, MATH 1050, BIOL 1010 or permission of instructor

Corequisites: GEO 1225

Justification:

This course is the second in a sequence of courses designed for first year geology majors. It is required in all geology programs as a pre-requisite for many other courses required of geology majors. It also serves as a course to introduce the study of fossils and earth history for students interested in these topics. This course is a common course number at other public colleges in the Utah system of higher education.

Student Learning Outcomes:

Upon successful completion of this course, a student should be able to:

- explain the basic principles of historical geology such as:
 - actualism
 - superposition
 - correlation of rocks
 - facies, and etc.
- understand the historical development of the science of geology
- describe and use the methods of relative and absolute dating
- understand the characteristics of the various environments in which sedimentation and life occurs
- understand the basic principles of stratigraphy
- interpret the conditions in which all types of rocks were formed
- understand the theory of plate tectonics today and as it applies to formation of rocks in the past
- understand how mountains are formed
- classify fossils by at least kingdom and phylum

- understand the basic principles of interpreting fossils and the fossil record
- understand the theory of evolution as it describes the changes in life on earth over time
- understand the development of the geologic time scale and the means by which geologic ages are determined
- describe the current knowledge about life and conditions that existed during the various eras and periods of geologic time based on the fossil and rock record
- write a research paper in the style of the Geological Society of America
- deliver a professional level talk on their research
- keep accurate and reliable field notes
- interpret geology in the field.

Content:

This course will include:

- Basic Principles of Historical Geology (and their origins)
- Sedimentary Environments
- Environments and Life
- Absolute Dating of Rocks
- Relative Dating of Rocks and Correlation
- Classification of Life/Fossils
- Evolution and the Fossil Record
- Plate Tectonics and Mountain Building
- The Origin and Early History of the Solar System and Earth
- The Origin of Life
- The Rock and Fossil Record of the Archean Eon
- The Rock and Fossil Record of the Proterozoic Eon
- The Rock and Fossil Record of the Paleozoic Era
- The Rock and Fossil Record of the Mesozoic Era
- The Rock and Fossil Record of the Cenozoic Era.

General Education Outcomes:

1) Read effectively, constructively, and critically.

Students are required to read the textbook for understanding of concepts. Feedback is given from reading quizzes. Students will also be required to read articles from juried journals as they prepare their research paper. Feedback is given on initial and final drafts of paper regarding understanding of concepts.

2) Write clearly, informatively, and persuasively.

Students will be assigned a five to ten page research paper to be written in the format used by the GSA (Geological Society of America). Guidance regarding writing will be given. Feedback will be given for initial and final drafts on writing. Students will also be assigned take home essays with each exam. Feedback will be given on writing on these exams.

3) Speak effectively in a variety of contexts.

Students will be required to give a 10-15 minute talk about their research paper that is in the format expected at

professional meetings (such as the Geological Society of America). Guidance will be given as students prepare both the talk and supporting visuals. Feedback will be given for practice talk and final talk.

- 4) Retrieve, evaluate, interpret, and deliver information through a variety of traditional and electronic media. Students will be assigned a five to ten page research paper to be written in the format used by the GSA (Geological Society of America). Guidance regarding writing and research will be given. A mixture of media will be required for references. Feedback will be given for initial and final drafts on research.
- 6) Apply computational skills to a variety of contexts. Students will be required to apply computational skills to a variety of topics including dating rocks. Feedback will be given on homework, quizzes and tests.
- 7) Apply scientific reasoning to a variety of contexts. Students are taught the basics principles of historical geology. They are required to apply these principles both on exams and in the field. Feedback is given from quizzes and tests.

Key Performance Indicators:

- 3-4 examinations (multiple choice, short answer and essays): 50% of the final grade
- research paper; 20- 25%
- field trip: 5 - 10%
- lecture final (comprehensive, conceptual, multiple choice and short answer): 20% of final grade

Representative Text and/or Supplies:

- J. Donald Prothero and Robert H. Dott, *Evolution of the Earth*, current edition.
- Reed Wicander and James Monroe, *Historical Geology Evolution of Earth and Life Through Time*, current edition.

Optimum Class Size: 12

Maximum Class Size: 20

Signatures:

I hereby submit this course syllabus:

Renee Faatz, , Associate Professor

I hereby find this course consistent with the goals and resources of the Geology Department:

Renee Faatz, , Associate Professor, Chair

I hereby find this course consistent with the goals and resources of the Natural Science and Mathematics Division:

Dan Black, EdD, Associate Professor, Dean

I have discussed the need for library resources related to this class with the person submitting the syllabus:

Lynn Anderson, MLIS, Technical Services Librarian (Main Campus)

Michelle Olsen, MLS, Campus Librarian (Richfield Campus)