GEO 1060

Division: Natural Science and Mathematics
Department: Geology
Course: GEO 1060
Title: Environmental Geology
Catalog Description:

This course is a study of the geological processes that affect or are affected by human activity such as earthquakes, volcanic hazards, flooding, waste, mineral and energy resources. This course is designed for non-majors. A field trip may be required.

General Education Requirements: Physical Science
Semesters Offered: Spring
Credit/Time Requirement: Credit: 3; Lecture: 3; Lab: 0
Clock/Hour Requirements: 0
Offered for Non-Credit: No
Prerequisites: MATH 1010 or equivalent

Justification:

This course is a general education class at Snow College. This course is intended to increase the student s knowledge of the geologic processes that often present direct threats to the heath and safety of humans. The course is also the first exposure that most students have to the science of geology and so it may act to attract some students to the major. This course is a common course number at other geology departments in the Utah state college system.

Student Learning Outcomes:

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

- understand that the earth is a system with limited resources
- understand the difference between renewable and non-renewable resources
- describe the structure of the earth
- list the three types of rocks and differences between them
- understand the theory plate tectonics
- understand the role of plate tectonics in creating earthquakes and tsunami
- locate the main zones of earthquake hazards in the United States
- describe the means by which geologists make long term and short term earthquake predictions
- understand the effects of earthquakes on man-made structures and natural phenomena
- locate the main zones of volcanic hazards in the United States
- describe the means by which geologists predict volcanic eruptions
- understand the effects of volcanic eruptions
- understand the cause of tsunami and the possible effects if it hits land
- locate the areas that are prone to tsunami

- understand the means by which geologists predict tsunami
- identify a floodplain
- understand the probability of flooding on a floodplain
- xescribe how humans attempt to control flooding and how humans can increase flood hazards
- identify the hazards of living in coastal areas and what can be done to reduce the risk of property damage
- list the types of fossil fuel, how they form and how they are extracted
- list the negative effects of fossil fuel extraction and use
- understand the alternative energy sources, the positive and negative aspects involved in their use
- discuss the complications of making decisions about what energy source to use
- understand the basic geological associations of major mineral resources
- understand the problems associated with mineral extraction
- understand the formation of soil, problems that cause soil loss and methods of prevention
- understand the hydrologic cycle
- understand groundwater, how it works, where it is found
- describe the problems associated with groundwater such as overuse, urbanization, contamination
- understand the design of a modern sanitary landfill and modern sewage treatment plant
- understand the problems associated with disposing of household waste and disposing and storing toxic and nuclear waste
- identify the source of major atmospheric pollutant and the effects they have on the atmosphere
- apply all the above outcomes to an area of interest to the student (such as their hometown).

Content:

This course will include:

- Earth Systems: Basic Principals of Systems and Cycles
- Earth Materials: Rocks and Minerals
- Internal Structure of the Earth
- Plate Tectonics
- Earthquakes
- Volcanoes
- Tsunami
- Mass Wasting
- Flooding
- Coastal Hazards
- Water Resources
- Fossil Fuels
- Alternative energy sources
- Mineral Resources
- Soil
- Waste
- Air and Water Pollution

General Education Outcomes:

1) Read effectively, constructively, and critically.
Students are required to read the text book for understanding of concepts. Feedback is given from reading quizzes. Students will also be required to read articles from journals and websites on various topics for their portfolio. Feedback is given on initial and final drafts of portfolio regarding understanding of concepts.

2) Write clearly, informatively, and persuasively.
Students will be assigned an environmental portfolio of the town of their choice. Students will write a summary of each section. Feedback will be given for the initial and final drafts. Feedback will also be given on written essays on quizzes and exams.

4) Retrieve, evaluate, interpret, and deliver information through a variety of traditional and electronic media.
Students will be assigned an environmental portfolio of the town of their choice. A mixture of media will be required for references including newspaper, journals, books, websites and local government offices. Feedback will be given for initial and final drafts research.

7) Apply scientific reasoning to a variety of contexts.
Students will be asked to apply the principles of environmental geology on exams and quizzes. Feedback will come from the quizzes and exams. Students will also be required to apply these concepts to the interpretation of hazards, resources and waste of their chosen portfolio area. Evaluation will be given on the portfolio on their ability to apply these concepts to these situations.

Key Performance Indicators:

- Quizzes and Homework: 5-10%
- 2-4 Hourly Exams: 45%
- Portfolio: 20-25%
- Comprehensive Final: 20-25%
- Field Trip: 5-10%

Representative Text and/or Supplies:

- Carla Montgomery, *Environmental Geology*, current edition.

Optimum Class Size: 24
Maximum Class Size: 30

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)