

COURSE OUTLINE

Geology 102 (C-ID Number: GEOL 130) Environmental Geology (C-ID Title: Environmental Geology)

1. Catalog Statement

Geology 102 is the study of the earth and natural hazards including hazards like earthquakes, volcanism, climate change, pollution and human interactions with the earth environment.

Total Lecture Units: 3.0

Total Laboratory Units: 0.0

Total Course Units: 3.0

Total Lecture Hours: 48.0

Total Laboratory Hours: 0.0

Total Laboratory Hours To Be Arranged: 0.0

Total Faculty Contact Hours: 48.0

Recommended Preparation: Eligibility for ENGL 120 or ESL 151

II. Course Entry Expectations

Prior to enrolling in the course, the student should be able to:

- analyze short essays (at least five paragraphs in length) to identify thesis, topic development and concluding sentences, as well as traditional expressions used to increase coherence;
- evaluate compositions for unity, and sufficiency of development, and coherence;
- organize and write a thesis-driven, organized essay which is at least three paragraphs in length (paragraphs should have a topic sentence and at least five additional sentences which further develop that topic sentence with explanations and examples);
- use in their essays a variety of sentence types with minimal errors in such basics of the sentence as subject-verb agreement, subordination, and complementation.

III. Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:

- demonstrate a fundamental understanding of concepts, principles and interactions of Earth's systems including:
 - a. the hydrologic cycle;
 - b. the rock cycle;
 - c. plate tectonics;
 - d. geologic hazards;
 - e. impacts of energy and resource usage;
 - f. climate, climate change and the greenhouse effect;
 - g. connectivity between the geosphere, atmosphere, hydrosphere and biosphere;
- articulate how human activities impact the environment;
- recognize and understand how to mitigate geologic hazards;
- explain the scientific method;
- communicate complex course concepts effectively in writing and diagrams.

IV. Course Content

Total Faculty Contact Hours = 48.0

- A. Formation of Earth and Plate Tectonics (**8 hours**)
 1. Geologic time and Earth history
 2. Plate tectonics
 3. Geologic structures
- B. Earth Systems (**8 hours**)
 1. Earth's systems including the rock cycle, carbon cycle, nitrogen cycle and water cycle
 2. Weather and climate
- C. Geologic Hazards (**12 hours**)
 1. Basic principles of earthquake geology
 2. Earthquakes and related phenomena
 3. Volcanism and volcanic hazards
 4. Streams and flooding
 5. Slope stability, landslides and subsidence
 6. Coastal processes and hazards
 7. Extreme weather events
- D. Resources and Pollution (**12 hours**)
 1. Water resources and pollution
 2. Mineral and rock resources and their exhaustibility
 3. Energy resources
 4. Soils and their management
 5. Human impacts from resource use, population growth, and waste
- E. Global Change and Environmental Management (**8 hours**)
 1. Global climate change
 2. Geology, society and the future
 3. Issues in environmental ethics, economics and law

V. Methods of Instruction

The following methods of instruction may be used in the course:

- lectures and in-class demonstrations;
- analysis of graphs, figures and data sets;
- instructor or student-led group discussion and peer-to-peer learning;
- media of appropriate content;
- computer-assisted learning and the internet;
- hands-on experiences of appropriate design;
- field trips.

VI. Out of Class Assignments

The following out of class assignments may be used in the course:

- creation and analysis of graphs, figures, and data sets;
- online assignments;
- field trip reports;
- individual or group projects that create reports or other media.

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:

- instructor evaluation of attendance, participation in class, and participation in group work of any kind;
- evaluation of student work by peers;
- creation and analysis of graphs, figures, and data sets;
- quizzes;
- tests, with at least one midterm exam and one final exam—exams including essay style or short answer questions are strongly encouraged;
- instructor evaluation of student-created reports or other media.

VIII. Textbook(s)

Montgomery, Carla. *Environmental Geology*, 10th ed. New York: McGraw-Hill Publishing Company, 2014. Print.

12th Grade Reading Level. ISBN 9780073524115.

or

Keller, Edward A. *Environmental Geology*, 9th ed. Upper Saddle River: Pearson Prentice Hall, 2011. Print.

12th Grade Reading Level. ISBN 9780321643759.

IX. Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

- demonstrate a fundamental understanding of concepts, principles and interactions of Earth's systems including:
 - a. the rock cycle;
 - b. plate tectonics;
 - c. geologic hazards;
 - d. impacts of energy and resource usage;
 - e. climate, climate change and the greenhouse effect;
 - f. connectivity between the geosphere, atmosphere, hydrosphere and biosphere.
- articulate how human activities impact the environment.
- recognize and understand how to mitigate geologic hazards.
- explain the scientific method.
- communicate complex course concepts effectively in writing and diagrams.