

## **COURSE OUTLINE**

### **Geology 112 Environmental Geology Laboratory**

#### **I. Catalog Statement**

Geology 112 is an introduction to the common laboratory practices and exercises in environmental geology. Laboratory exercises include analyzing topographic and geological maps and aerial and satellite imagery. Also included are identifying common mineral and rock samples, water and soil analysis and integrating data from the World Wide Web in problem solving exercises.

Units - 1.0

Laboratory Hours - 3.0

(Faculty Laboratory Hours 3.0 + Student Laboratory Hours 0.0 = 3.0 Total Laboratory Hours).

Prerequisite: Geology 102. (Geology 102 may be taken concurrently.)

Note: Geology 102 may be taken concurrently with Geology 112

#### **II. Course Entry Expectations**

Skills Level Ranges: Reading 5; Writing 5; Listening-Speaking 5; Math 3

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

1. describe the geoenvironmental hazards like earthquakes and volcanic activity;
2. describe the geoenvironmental hazards such as landslides, floods, erosion, and climate change;
3. examine the geoenvironmental hazards attendant to human interference with the earth's environment;
4. evaluate the environmental issues associated with utilization and management of mineral, water and energy resources;
5. articulate the ethical, socioeconomical and/or public policy aspects of global change and related issues from the geological perspective.

#### **III. Course Exit Standards**

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

1. examine the geoenvironmental hazards such as earthquakes and volcanism that are driven by the earth's internal energy system;
2. examine the geoenvironmental hazards that are driven by processes at the solar-

- terrestrial interface (e.g. landslides, floods, erosion, climate change;
3. examine the geoenvironmental hazards attendant to human interference with earth's environment (e.g. air and water pollution, soil degradation, disposal of waste)
  4. analyze the problems posed by the depletion of mineral, water and energy resources.

#### **IV. Course Content**

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| A. Exercises on the Earth's Materials and Maps   | 15 hours |
| <ol style="list-style-type: none"> <li>1. Classification of the earth's materials</li> <li>2. Physical properties of minerals</li> <li>3. Identification of minerals and rocks</li> <li>4. Exercises on map locations and scales</li> <li>5. Reading and making a topographical map</li> </ol>   |          |
| B. Exercises on Environmental Hazards and Processes  | 12 hours |
| <ol style="list-style-type: none"> <li>1. Volcanoes, volcanic materials, and volcanic eruptions</li> <li>2. Earthquake measurements, disasters mitigation strategies, and seismic risk analyses</li> <li>3. Landslides and avalanches</li> <li>4. River processes, flood hazards, and mitigation strategies</li> <li>5. Coastal processes and coastal erosion</li> </ol>   |          |
| C. Exercises on Climate Change, Environmental Pollution and Waste Disposal   | 12 hours |
| <ol style="list-style-type: none"> <li>1. Atmospheric and ocean circulation, climate change, and related issues</li> <li>2. Surface water pollution (point and non-point sources)</li> <li>3. Soil degradation and groundwater pollution</li> <li>4. Air pollution, acid rain, and the ozone problem</li> <li>5. Solid waste disposal</li> </ol>   |          |
| D. Exercises on the Earth's Resources and Sustainable Growth   | 9 hours  |
| <ol style="list-style-type: none"> <li>1. Agriculture, aquaculture, and the food resources</li> <li>2. Soil, water, and forest resources and the importance of biogeochemical cycles.</li> <li>3. Metallic, nonmetallic, and industrial mineral resources and their exhaustibility</li> <li>4. Conventional versus unconventional energy resources</li> <li>5. Population growth, economic imperatives, and the earth's environment in crisis</li> </ol> |          |

#### **V. Methods of Presentation**

The following instructional methodologies may be used in the course:

1. in-class demonstrations and exercises;
2. use of computer-assisted learning and the internet;
3. group discussions and peer analyses;

4. screening of instructional videos;
5. visiting sites of geoenvironmental interest.

## **VI. Assignments and Methods of Evaluation**

1. Laboratory, web-based, and field exercises
2. Periodic quizzes and tests, including mid-term and final examinations.
3. A laboratory project and/or research report and term paper
4. A case study or field project may be assigned.

## **VII. Textbook**

Blatt, H., Laboratory Exercises in Environmental Geology  
Boston: Mc Graw-Hill, 2000  
2th Grade Textbook Reading Level. ISBN: 0-697-28288-0

## **VIII. SLO**

1. Students will be able to read and interpret a simple geological map.
2. Students will be able to identify hand specimens of common rocks and minerals.