



ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Natural Sciences & Business

COURSE: GEL 1007 Environmental Geology

Date: Spring 2022

Credit Hours: 4

Complete all that apply or mark "None" where appropriate:

Prerequisite(s): None

Enrollment by assessment or other measure? Yes No

If yes, please describe:

Corequisite(s): None

Pre- or Corequisite(s): None

Consent of Instructor: Yes No

Delivery Method: **Lecture** **3 Contact Hours** (1 contact = 1 credit hour)
 Seminar **0 Contact Hours** (1 contact = 1 credit hour)
 Lab **2 Contact Hours** (2-3 contact = 1 credit hour)
 Clinical **0 Contact Hours** (3 contact = 1 credit hour)
 Online
 Blended
 Virtual Class Meeting (VCM)

Offered: **Fall** **Spring** **Summer**

CATALOG DESCRIPTION and IAI NUMBER (if applicable):

This is an introductory course in the study of the interactions between human activities and the earth and geologic processes. An overview of modern geologic concepts is followed by an in-depth examination of natural hazards, natural resources, waste management, environmental restoration and land-use planning. This course provides instruction in applied geology and scientific reasoning that is useful to all students.

IAI Equivalent: P1 908L

ACCREDITATION STATEMENTS AND COURSE NOTES:

None

COURSE TOPICS AND CONTENT REQUIREMENTS:

1. Foundations of Geology
Provides a description of the basic concepts of geology including scientific analysis, plate tectonics, the rock cycle, and the hydrologic cycle. Provides information on the basic types of earth materials including minerals, rocks, sediments, and soils.
 - A. Introduction to Geology
 - B. Earth Materials

2. Hazardous Earth Processes
Provides a discussion of hazardous earth processes, their causes, the impacts of the processes on humans, the impacts of humans on the processes, and the response of humans to the hazards.
 - A. Rivers and Flooding
 - B. Landslides
 - C. Earthquakes
 - D. Volcanoes
 - E. Coastal Hazards

3. Earth Resources
Provides a description of earth resources, how they came to be, and the impact of human use on those resources.
 - A. Fresh Water
 - B. Mineral Resources
 - C. Energy Resources

4. Pollution and Human Health
Provides a description of various pollutants and what happens to them when they enter the environment. Describes the impact of natural and human-introduced substances on human health.
 - A. Water Pollution
 - B. Land Pollution
 - C. Air Pollution
 - D. Human Health and the Environment

5. Land Use Planning
Provides a description of the methods used when planning to the use of earth resources including a discussion of the scientific, economic, and political aspects of planning. Students plan the use of a square mile of land around their home.
 - A. Planning for Hazards
 - B. Resource Use Planning

INSTRUCTIONAL METHODS:

1. Lectures
 - A. In class

- B. On-line videos with slides
- 2. Discussions
 - A. Asynchronous, web-based discussion
 - B. May include individual oral presentations on specified topics
- 3. Audio-visual Aids - videos, podcasts, slides, charts, and maps
- 4. Supplemental Reading
 - A. Internet sites
 - B. Journals and periodicals
 - C. Newspapers
 - D. Books
 - E. Pamphlets and brochures

EVALUATION OF STUDENT ACHIEVEMENT:

- 1. Textbook reading
- 2. Other assigned reading
- 3. Regular attendance and participation in discussion
- 4. Laboratory exercises
- 5. Written papers
 - A. Term project: report on the environmental geology of a one-square mile area near the student's home.
 - B. Opportunity for optional (independent) additional library research reports

INSTRUCTIONAL MATERIALS:

Textbooks

- *Introduction to Environmental Geology*. Keller, E.A., (current ed.)
- *Investigations in Environmental Geology*. Foley, Duncan, et.al., (current ed.)

Resources

- Links to appropriate internet sites provided in on-line course materials provided on course web site.

LEARNING OUTCOMES AND GOALS:

Institutional Learning Outcomes

- 1) Communication – to communicate effectively;
- 2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion;
- 3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally;
- 4) Responsibility – to recognize how personal choices affect self and society.

Course Outcomes and Competencies

- 1. Understand how science works and the characteristics of environmental geology.
 - Competency 1.1: Identify the methodology of science.
 - Competency 1.2: Critically evaluate datasets and infer valid conclusions from those datasets.
 - Competency 1.3: Identify the basic concepts of geology as a method for the scientific study of the Earth.

- Competency 1.4: Recognize environmental geology as an application of the science of geology to the interactions between humans and the Earth and Earth processes.
2. Understand hazardous geologic processes and the interactions between humans and those processes.
 - Competency 2.1: Identify, analyze, and evaluate the hazards presented by rivers, the natural and human causes of those hazards, and the human responses to those hazards.
 - Competency 2.2: Identify, analyze, and evaluate the hazards posed by unstable slopes, the natural and human contributions to those hazards, and the human responses to those hazards.
 - Competency 2.3: Identify, analyze, and evaluate the hazards posed by earthquakes, the natural causes of those hazards, and the human responses to those hazards.
 - Competency 2.4: Identify, analyze, and evaluate the hazards posed by volcanoes, the natural causes of those hazards, and the human responses to those hazards.
 - Competency 2.5: Identify, analyze, and evaluate the hazards found in coastal areas, the natural and human contributions to those hazards, and the human responses to those hazards.
 3. Understand geologic resources and the interactions between humans and those processes.
 - Competency 3.1: Identify the properties of soils, describe the processes that contribute to the formation of soil, describe, analyze, and evaluate the impact humans have on soil development and quality.
 - Competency 3.2: Identify the primary sources of fresh water, describe how fresh water is used, describe, analyze, and evaluate the impact of humans on fresh water resources.
 - Competency 3.3: Identify the primary energy resources, describe where those resources are located and how they are extracted, describe, analyze, and evaluate the geological impact of human use of those resources.
 - Competency 3.4: Identify the primary mineral resources, describe where those resources are located and how they are extracted, describe, analyze, and evaluate the geological impact of human use of those resources.
 4. Understand human impact on the environment and the environment's impact on human health.
 - Competency 4.1: Identify, analyze, and evaluate the primary sources and impacts of surface and ground-water pollution.
 - Competency 4.2: Identify, analyze, and evaluate the primary sources and impacts of land pollution.
 - Competency 4.3: Identify, analyze, and evaluate the primary sources and impacts of air pollution.
 - Competency 4.4: Describe the impact of natural, inorganic substances on human health.
 5. Understand the resources available for the study of geologic processes.
 - Competency 5.1: Identify the features common to all maps and use maps to identify human and geologic phenomena.
 - Competency 5.2: Identify public information resources useful in geologic research and use those resources to identify geologic resources and hazards and human impacts.

- Competency 5.3: Identify publications useful in geologic research and use those publications to identify geologic resources and hazards and human impacts.
6. Express insight and judgment with regard to future options that may resolve environmental concerns.
- Competency 6.1: Discuss their personal relationship with the environment and value judgements they make of their actions
- Competency 6.2: Describe and evaluate the processes by which humans can protect the environment, including politically.
- Competency 6.3: Examine a designated area and identify, analyze, and evaluate resources and potential hazards.