



ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: NATURAL SCIENCES & BUSINESS

COURSE: GEL 1005 Natural Disasters

Date: Fall 2019

Credit Hours: 3

Prerequisite(s): None

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

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

IAI Equivalent –**Only for Transfer Courses**-go to <http://www.itransfer.org>: P1 908

CATALOG DESCRIPTION:

This is an introductory course in the study of the interactions between human activities and hazardous natural processes. An overview of modern concepts in geology and other earth sciences is followed by an in-depth examination of natural hazards including the nature of hazards, human impacts on hazardous processes, the impact of hazards on humans, and human responses to hazards. This course provides instruction in applied geology and other earth sciences and scientific reasoning that is useful to all students.

GENERAL EDUCATION GOALS ADDRESSED

[See last page for Course Competency/Assessment Methods Matrix.]

Upon completion of the course, the student will be able:

[Choose up to three goals that will be formally assessed in this course.]

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciation for diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

[Outcomes related to course specific goals. See last page for more information.]

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

1. Understand how science works and the characteristics of natural hazards.
 - 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 and other earth sciences as a method for the scientific study of the natural hazards.
 - Competency 1.4: Recognize the study of natural hazards as an application of the geology and other earth sciences to the interactions between humans and hazardous Earth processes.
 - Competency 1.5: Recognize important characteristics of natural hazards and analyze and evaluate those characteristics to identify those that are the most important for risk assessment and hazard forecast and prediction.
2. Understand risk assessment as it is applied to natural hazards
 - Competency 2.1: Identify the methodology of risk assessment.
 - Competency 2.2: Identify the components of a natural hazard and analyze and evaluate the components to identify those that contribute to risk and determine their relative importance.
 - Competency 2.3: Identify the human components of risk and analyze and evaluate the components to determine their relative importance.
 - Competency 2.4: Identify the components of risk communication and analyze and evaluate risk communication documents.

3. Understand hazardous geologic processes and the interactions between humans and those processes.
 - Competency 3.1: 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 3.2: 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 3.3: Identify, analyze, and evaluate the hazards posed by earthquakes, the natural causes of those hazards, and the human responses to those hazards.
 - Competency 3.4: Identify, analyze, and evaluate the hazards posed by volcanoes, the natural causes of those hazards, and the human responses to those hazards.
 - Competency 3.5: 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.
 - Competency 3.6: Identify, analyze, and evaluate the hazards found in weather, the natural and human contributions to those hazards, and the human responses to those hazards.
 - Competency 3.7: Identify, analyze, and evaluate the hazards posed by extra-terrestrial objects and the human responses to those hazards.
 - Competency 3.8: Identify, analyze, and evaluate the hazards to identify interactions between hazardous processes.

4. Understand the resources available for the study of natural hazards.
 - Competency 4.1: Identify the features common to all maps, and use maps to identify human and.
 - Competency 4.2: Identify public information resources useful in natural hazards research.
 - Competency 4.3: Identify publications useful in natural hazards research and use those publications to identify natural hazards.

5. Express insight and judgment with regard to future options that may lessen the impact of natural hazards.
 - Competency 5.1: Discuss their personal relationship with natural hazards and value judgments they make of their actions.
 - Competency 5.2: Describe and evaluate the processes by which humans can address natural hazards, including politically.
 - Competency 5.3: Examine a designated area and identify, analyze, and evaluate potential natural hazards.
 - Competency 5.4: Examine a designated area and identify, analyze, and evaluate how potential natural hazards are being addressed and how they should be addressed.

MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

[For each of the goals selected above, indicate which outcomes align with the goal.]

Goals	Outcomes
First Goal	
To apply analytical and problem-solving skills to personal, social and professional issues and situations.	1. Understand how science works and the characteristics of natural hazards. 2. Understand risk assessment as it is applied to natural hazards 3. Understand hazardous geologic processes and the interactions between humans and those processes. 4. Understand the resources available for the study of natural hazards. 5. Express insight and judgment with regard to future options that may lessen the impact of natural hazards.
Second Goal	
To communicate successfully, both orally and in writing, to a variety of audiences.	5. Express insight and judgment with regard to future options that may lessen the impact of natural hazards.
Third Goal	
To connect learning to life.	2. Understand risk assessment as it is applied to natural hazards 3. Understand hazardous geologic processes and the interactions between humans and those processes. 4. Understand the resources available for the study of natural hazards. 5. Express insight and judgment with regard to future options that may lessen the impact of natural hazards.

COURSE TOPICS AND CONTENT REQUIREMENTS:

1. Foundations of Natural Hazards
 Provides a description of the basic concepts of natural hazards including scientific analysis and weather and surficial geologic processes. Provides information on the basic types of natural hazards. Provides an exploration of how natural hazards are analyzed.
 - A. Introduction to Natural Hazards
 - B. Classification of Natural Hazards
 - C. Components of Natural Hazards

2. Foundations of Risk Assessment
 Provides a description of the basic concepts of risk assessment including identifying characteristics of hazardous natural processes, . Provides information on the basic types of natural hazards. Provides an exploration of how natural hazards are analyzed and how risks are assessed and communicated.
 - A. Risk Analysis
 - B. Risk Characterization
 - C. Risk Communication

- D. Response to Risk
3. 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, the response of humans to the hazards, and the assessment of risk.
- A. Rivers and Flooding
 - B. Landslides
 - C. Earthquakes
 - D. Volcanoes
 - E. Hurricanes
 - F. Tsunamis
 - G. Severe Thunderstorms and Tornadoes
 - H. Winter Storms
 - I. Other Weather Hazards (Heat Waves, Fog, Droughts)
 - J. Extraterrestrial Object Impacts
4. Natural Hazard Analysis and Planning
Provides a description of the methods used when planning for natural hazards including a discussion of the scientific, economic, and political aspects of planning. Students identify, analyze, evaluate, and discuss natural hazard planning in a specific community.
- A. Hazard Assessment
 - B. Hazard Communication
 - C. Hazard Planning

INSTRUCTIONAL METHODS:

- 1. Lectures
- 2. Discussions - may include individual oral presentations on specified topics
- 3. Demonstrations
- 4. Audio-visual Aids - films, video tapes, filmstrips, transparencies with overhead projector, slides, charts, and maps
- 5. Supplemental Reading
 - A. Journals and periodicals
 - B. Newspapers
 - C. Books
 - D. Pamphlets and brochures
 - E. Internet sites

INSTRUCTIONAL MATERIALS:

Text: *Natural Hazards*. Keller, E.A., and DeVecchio, D.E. (current ed.)

Supplements: Transparencies, charts, maps, slides, publications, www sites

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

1. Textbook reading
2. Other assigned reading
3. Regular attendance and participation in discussion
4. Laboratory exercises
5. Written papers
 - A. Term projects (2): report on a natural hazard and its impact on a community including a risk assessment, effects, and response.
 - B. Opportunity for optional (independent) additional research reports

Grading scale:

90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
< 60%	F

OTHER REFERENCES

1. **TEXT:** *Natural Disasters*. Keller, E.A., and DeVecchio, D.E., (current edition)
2. Journals such as: *Geology*, *Journal of Geoscience Education*, *Earths*, *GSA Today*, *Environment*, *Scientific American*, *EPA Journal*, *National Geographic*, and others.
3. Reference texts and books such as:
 - Environmental Geology* (5th edition), Montgomery, 1997
 - Introduction to Environmental Geology* (6th edition), Keller, 2010
 - Flood Geomorphology*, Baker, Kochel, and Patton, 1988
 - The Urban Environment*, Arnold, 1983
 - Geology and Society*, Coates, 1985
 - Process Geomorphology*, Ritter, Kochel, and Miller, 1995
 - To Interpret the Earth: Ten Ways to be Wrong*, Schumm, 1991
 - The Great Flood of 1993: Geologic Perspectives on the Flooding along the Mississippi River and Its Tributaries in Illinois*, Chrzastowski, et.al., 1994
 - Seismicity of Illinois*, Heigold and Larson, 1990
 - Environmental Science: A Global Concern*. Cunningham and Cunningham, 2014
4. Numerous other books, pamphlets, and journals on a wide variety of environmental topics published by the government are available in the Federal Depository section of our library.

