



# El Camino College

## COURSE OUTLINE OF RECORD - Official

### I. GENERAL COURSE INFORMATION

**Subject and Number:** Geology 15  
**Descriptive Title:** Natural Disasters

**Course Disciplines:** Earth Science

**Division:** Natural Sciences

**Catalog Description:** This course presents a study of natural hazards such as earthquakes, volcanism, hurricanes, landslides and floods and how we can prepare for and possibly mitigate these phenomena in order to lessen their impact on society. In addition, this course will address global climate change and associated earth science processes, as well as the misuse and pollution of vital natural resources such as freshwater.

**Conditions of Enrollment:** Recommended Preparation

English 82

**Course Length:**  Full Term  Other (Specify number of weeks):

**Hours Lecture:** 3.00 hours per week  TBA

**Hours Laboratory:** 0 hours per week  TBA

**Course Units:** 3.00

**Grading Method:** Letter  
**Credit Status:** Associate Degree Credit

**Transfer CSU:**  Effective Date: Prior to July 1992

**Transfer UC:**  Effective Date: Prior to July 1992

**General Education:**

**El Camino College:** 1 – Natural Sciences

Term:

Other:

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**CSU GE:** B1 - Physical Science

Term:

Other: Approved

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**IGETC:** 5A - Physical Science without Lab

Term: Fall 1995

Other:

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## II. OUTCOMES AND OBJECTIVES

### A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. Students can identify the salient features of the basic concepts of geology. (This includes the ability to recall the definitions of the specialized vocabulary of geology.)
2. Students recognize and can accurately articulate how the Earth affects humans' lives and how human activities affect the Earth.
3. Students can identify the key elements of the scientific method (hypotheses, tests, observations, conclusions/interpretation of observations) in popular accounts of scientific research in magazines, newspapers, etc.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

### B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Evaluate the cause and distribution of such natural hazards as earthquakes, volcanic eruptions, hurricanes, landslides, flooding, and coastal erosion.

Objective Exams

2. Assess the effects of global climate change as well as explain the geographic distribution of these effects.

Presentation

3. Analyze the proper use of the land in order to avoid depletion and pollution of water and other natural resources.

Objective Exams

## III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	5	I	Weathering A. Earth materials and soils B. Urbanization impact on weathering
Lecture	4	II	Plate Tectonics A. Introduction to plate tectonics and geologic time B. Evaluating plate tectonics as an evolving field C. Building tsunami and earthquake science
Lecture	3	III	Overpopulation A. Impact of human population growth. Students will evaluate how exponential growth of population increases the toll of natural hazards on life and the economy.
Lecture	6	IV	Volcanism

			A. Volcanic activity, hazards, and case histories. Students will evaluate volcano hazard maps and predict eruptions.
Lecture	6	V	Structural Geology A. Geologic structures earthquakes, hazards and case histories B. Seismic building codes and relationship with tsunami
Lecture	3	VI	Mass Wasting A. Mass movements, hazards and case histories B. Engineering structures to prevent mass wasting in Los Angeles
Lecture	3	VII	Flooding and Case Histories A. Urban runoff B. Other flooding events
Lecture	3	VIII	Coastal Hazards A. Waves B. Currents and coastlines C. Global climate change
Lecture	3	IX	Water Resources A. Climate change and freshwater B. Ground water and contamination C. Potable water
Lecture	6	X	Global Climate Change A. Redistribution of biomes B. Increases in forest fires and hurricanes due to climate change
Lecture	3	XI	Hurricanes and Hazards A. Frequency and case histories B. Geographic distribution C. Temporal frequency
Lecture	3	XII	Glaciers and Hazards A. Climate change B. Shrinking ice sheets C. Earth's decreasing albedo
Lecture	3	XIII	Wildfires A. Frequency and geographic distribution B. Impact of climate change and urbanization on fires
Lecture	3	XIV	Disaster Mitigation A. The economy and the cost of disaster B. Public policy C. Engineering geology D. Growing workforce
<b>Total Lecture Hours</b>		54	
<b>Total Laboratory Hours</b>		0	
<b>Total Hours</b>		54	

#### IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

##### A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

**B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:**

Examine a liquefaction risk map of Los Angeles County and list the cities that have a high risk of liquefaction damage during an earthquake and the main factors contributing to the high risk. In a paragraph using complete sentences, describe what property owners can do to reduce the risk of liquefaction if they are in a high risk area.

**C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:**

1. Carefully examine Figure 1, the explanation for this figure, and the topographic map for this area (Figure 2 in the map section). What are the contour intervals used on these maps? Place an X in the area of the largest landslide deposit within the enclosed area in the center of Figure 1. What is the approximate area of this slide, in square miles? What materials make up the landslide deposit? Please answer in paragraph form on an attached sheet of paper.
2. A topographic map of the area is shown in Figure A. Your first concern in this area is for earthquakes. What evidence would you look for in bedrock and in alluvium to ascertain the potential for earthquake hazards? It has been suggested that important facilities that concentrate people, such as schools and shopping centers, or those that are likely to be required after an earthquake, such as hospitals and fire stations, should not be built within one-quarter mile of this fault zone. Do any such facilities currently exist in the area? What hazards, if any, do they present? When liquefaction occurs, the soils lose their ability to support the weight of structures. The orientation of soil grains changes such that water between the sand grains rather than the sand grains themselves must bear the load of a building during liquefaction. Structures that stand well on soils do not stand well when they are "floating." Water-saturated and sandy soils are most susceptible to liquefaction when shaken in an earthquake. Where would you expect to find sand sediments in this area? Why? Please answer in paragraph form on an attached sheet of paper.

**D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:**

Essay exams

Other exams

Quizzes

Reading reports

Written homework

Homework Problems  
Term or other papers  
Multiple Choice  
Completion  
Other (specify):  
Short essay questions  
Research Report (1-3 pages)

Presentation

## **V. INSTRUCTIONAL METHODS**

Demonstration  
Discussion  
Field trips  
Group Activities  
Internet Presentation/Resources  
Lecture  
Multimedia presentations

**Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.**

## **VI. WORK OUTSIDE OF CLASS**

Study  
Answer questions  
Required reading  
Problem solving activities  
Written work

**Estimated Independent Study Hours per Week: 6**

## **VII. TEXTS AND MATERIALS**

### **A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS**

Donald Hyndman and David Hyndman. Natural Hazards. 4th Edition ed. Brooks/Cole, Cengage Learning, 2014.  
Edward Keller and Robert Blodgett,. Natural Hazards. 3rde Edition ed. Pearson Prentice Hall, 2012.

### **B. ALTERNATIVE TEXTBOOKS**

**C. REQUIRED SUPPLEMENTARY READINGS**

**D. OTHER REQUIRED MATERIALS**

**VIII. CONDITIONS OF ENROLLMENT**

**A. Requisites (Course and Non-Course Prerequisites and Corequisites)**

Requisites	Category and Justification
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**B. Requisite Skills**

Requisite Skills
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**C. Recommended Preparations (Course and Non-Course)**

Recommended Preparation	Category and Justification
Course Recommended Preparation English-82	

**D. Recommended Skills**

Recommended Skills
Students are required to read a college-level textbook. A student needs to have good reading skills to understand and interpret information provided in the textbook and other reading assignments. ENGL 82 - Identify at the paragraph level the topic sentence, supporting details, transitions and patterns of organization of short reading selections.

**E. Enrollment Limitations**

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by E. J. Baldwin, R. H. Arntson, W. Hirt on 11/01/1982.

**BOARD APPROVAL DATE:**

**LAST BOARD APPROVAL DATE:**

**Last Reviewed and/or Revised by Sara Di Fiori on 10/16/2015**