

GEOL M61: NATURAL DISASTERS

Originator

rputnam

College

Moorpark College

Discipline (CB01A)

GEOL - Geology

Course Number (CB01B)

M61

Course Title (CB02)

Natural Disasters

Banner/Short Title

Natural Disasters

Credit Type

Credit

Start Term

Fall 2022

Catalog Course Description

Surveys natural phenomena that have extreme environmental effects on the earth: earthquakes, volcanoes, and mass movements; severe weather events such as hurricanes, tornadoes, floods and droughts, tsunamis and storm surges; and impacts by meteors and comets. Emphasizes effects on human populations and includes strategies to mitigate and avoid disasters.

Taxonomy of Programs (TOP) Code (CB03)

1914.00 - Geology

Course Credit Status (CB04)

D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)

A (Transferable to both UC and CSU)

Course Basic Skills Status (CB08)

N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)

E - Non-Occupational

Course Cooperative Work Experience Education Status (CB10)

N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)

Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)

N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)

Y - Not Applicable

Course Noncredit Category (CB22)

Y - Credit Course

Funding Agency Category (CB23)

Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)

1 - Program Applicable

General Education Status (CB25)

Y - Not Applicable

Support Course Status (CB26)

N - Course is not a support course

Field trips

May be required

Faculty notes on field trips; include possible destinations or other pertinent information

Local sites that display geology related to natural hazards. Sites include: La Conchita debris flow, Ventura Point, Las Lajas Canyon, and Malibu Creek State Park

Grading method

(L) Letter Graded

Alternate grading methods

(O) Student Option- Letter/Pass

(P) Pass/No Pass Grading

Does this course require an instructional materials fee?

No

Repeatable for Credit

No

Is this course part of a family?

No

Units and Hours

Carnegie Unit Override

No

In-Class

Lecture

Minimum Contact/In-Class Lecture Hours

52.5

Maximum Contact/In-Class Lecture Hours

52.5

Activity

Laboratory

Total in-Class

Total in-Class

Total Minimum Contact/In-Class Hours

52.5

Total Maximum Contact/In-Class Hours

52.5

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class

Minimum Outside-of-Class Hours

105

Maximum Outside-of-Class Hours

105

Total Student Learning

Total Student Learning

Total Minimum Student Learning Hours

157.5

Total Maximum Student Learning Hours

157.5

Minimum Units (CB07)

3

Maximum Units (CB06)

3

Student Learning Outcomes (CSLOs)

Upon satisfactory completion of the course, students will be able to:

- 1 interpret a major natural hazard through the lens of the 4 P's: Process, Procedure (mitigation), Prediction, and Preparedness.
- 2 relate the concepts of magnitude and frequency to the major types of natural hazards.

Course Objectives

Upon satisfactory completion of the course, students will be able to:

- 1 explain how plate tectonics is responsible for earthquakes, tsunamis, and geologic structures.
- 2 explain the distribution and potential magnitude of seismic activity and earthquakes in relation to plate tectonics and plate boundaries.
- 3 identify the eruptive styles and explosivity of different volcanic settings and apply to currently active or dormant volcanoes.
- 4 identify and analyze physical, chemical and biological factors of a landscape that is susceptible to mass wasting events.
- 5 analyze the causes of mass extinction events in Earth's history.
- 6 describe how atmospheric phenomena and anthropogenic causes affect climate conditions.
- 7 assess the geographic and population parameters that affect wildfire hazards.
- 8 discuss the variety and intensity of potentially hazardous flooding events along rivers and along coastlines.
- 9 describe the internal (geological) and external (meteorological and astronomical) events that have most affected life on planet earth.
- 10 discuss mitigation strategies for basic natural hazards.

Course Content

Lecture/Course Content

- (7%) - Earth as a system
 - Internal and external processes
 - Energy sources and flow in the Earth system
- (6%) - Population dynamics
 - Human population history
 - Changing environmental relationships
- (10%) - Plate tectonics
 - Earth's internal structure
 - Plate boundary types and their relationship to natural hazards
 - Driving forces of plate tectonics
- (14%) - Earthquake
 - Fault types
 - Seismic waves
 - Earthquake hazard locations, specifically in western North America
 - Tsunamis
 - Earthquake hazard mitigation
- (13%) - Volcanoes
 - Melting processes and magma types
 - Volcanic landforms
 - Volcanic eruptive styles and hazards
- (7%) - Mass movements
 - Triggering mechanisms
 - Classification of landslide activity
- (7%) - Floods
 - Fluvial processes and geomorphology
 - Causes and recurrence of flooding
 - Flood mitigation strategies
- (10%) - Severe weather
 - Atmospheric properties
 - Causes of weather, generally
 - Principles and examples of extreme weather events: tropical cyclones, thunderstorms, tornadoes, blizzards.
- (7%) - Wildfire
 - Causes and mitigation strategies
 - Ecological and social relationships with fire
- (12%) - Climate change
 - Causes of long-term atmospheric variability
 - Climate connection to other natural hazards
 - Tools of climatology and the record of the past
 - Current conditions and future projections
- (7%) - Bolide impacts and mass extinctions
 - Extraterrestrial debris and frequency of impacts
 - History of life on Earth and major extinction events

Laboratory or Activity Content

N/A

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Written expression
Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Essay exams
Group projects
Individual projects

Journals
 Objective exams
 Oral presentations
 Research papers
 Skills demonstrations
 Written analyses
 Written compositions
 Classroom Discussion
 Projects
 Participation
 Reports/Papers/Journals

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Audio-visual presentations
 Case studies
 Class activities
 Class discussions
 Collaborative group work
 Demonstrations
 Distance Education
 Field trips
 Group discussions
 Guest speakers
 Internet research
 Lecture
 Readings
 Small group activities

Describe specific examples of the methods the instructor will use:

- Students observe video clips and read accounts of case studies of historical and recent natural disasters and evaluating their causes in small groups.
- Explore plate tectonic boundaries in Google Earth and assess the potential natural hazards present at these spots.
- In class concept mapping exercise exploring the role of energy in the Earth system and how it relates to natural hazards.

Representative Course Assignments

Writing Assignments

- Conduct an audit of home safety procedures and present results in a narrative form.
- Write weekly journal exercise assessing a natural disaster that happened somewhere in the world during the prior week.
- Write a case study of a historical natural disaster that explains the causes of the natural phenomenon, the effect on the local/regional population, and what mitigation measures were (or should have) been in place.

Critical Thinking Assignments

- Conduct a basic risk analysis posed by a given natural hazard to a region.
- Read literature on local or regional disaster planning and write an essay analyzing the findings.
- Evaluate the cost of mitigation measures for a potential hazard for a hypothetical community.

Reading Assignments

- Read literature on local or regional disaster planning and write an essay analyzing the findings.
- Read historical narratives about notable historical natural disasters.

Skills Demonstrations

- Evaluate natural hazard risk to a region, given its plate tectonic setting, latitude, proximity to the ocean, population level, and socioeconomic status.
- Calculate recurrence intervals for natural hazards in a region, given a historical record of the magnitude of the events that occurred there.

Outside Assignments

Representative Outside Assignments

- Write a report that relates course content to exhibits at a natural history museum and/or historic/potential hazard site(s).
- Evaluate home safety preparedness for an identified geologic hazard.
- Research and prepare an oral presentation or written report evaluating hazard potential for an area.

Articulation

Equivalent Courses at 4 year institutions

University	Course ID	Course Title	Units
CSU Los Angeles	GEOL 1580	Natural Disasters	3
UC San Diego	SIO 15	Natural Disasters	4
CSU Long Beach	GEOL 110	Natural Disasters	3

Comparable Courses within the VCCCD

GEOL V21 - Natural Disasters

District General Education

A. Natural Sciences

A2. Physical Science

Approved

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

Course is CSU transferable

Yes

CSU Baccalaureate List effective term:

F1995

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

B1 Physical Science

Approved

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

Area F: Ethnic Studies

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

UC TCA

UC TCA
Approved

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 5A: Physical Science
Approved

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type

Textbook

Description

Abbott, Patrick L. *Natural Disasters*. 11th ed., McGraw-Hill, 2020.

Resource Type

Textbook

Description

Hyndman, Donald, and David Hyndman. *Natural Hazards and Disasters*. 5th ed., Brooks Cole, 2016.

Resource Type

Textbook

Description

Keller, Edward A., and Duane DeVecchio. *Natural Hazards: Earth's Processes as Hazards, Disasters and Catastrophes*. 5th ed., Routledge, 2019.

Library Resources

Assignments requiring library resources

Research, using the Library's print and online resources.

Sufficient Library Resources exist

Yes

Example of Assignments Requiring Library Resources

Utilize library resources to research on topics relating to natural hazard causes, case studies, and mitigation such as:

- Written case study of a historical natural disaster that explains the causes of the natural phenomenon, the effect on the local/regional population, and what mitigation measures were (or should have) been in place.

-Read literature on local or regional disaster planning and write an essay analyzing the findings.

Distance Education Addendum**Definitions****Distance Education Modalities**

Hybrid (1%–50% online)

Hybrid (51%–99% online)

100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities.

Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

Regular Effective/Substantive Contact**Hybrid (1%–50% online) Modality:**

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes.
E-mail	Email, class announcements and tools such as “Message Students Who” and “Assignment Comments” in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.
Other DE (e.g., recorded lectures)	Faculty will use a variety of tools and media integrated within the LMS to help students reach SLO such as: <ul style="list-style-type: none"> o Recorded Lectures, Narrated Slides, Screencasts o Instructor created content o MC Online Library Resources o Canvas Peer Review Tool o Canvas Student Groups (Assignments, Discussions) o 3rd Party (Publisher) Tools (Mastering Geography) o Websites and Blogs o Multimedia (YouTube, Films on Demand, 3CMedia, Google Earth, Earth.nullschool, etc.)

Synchronous Dialog (e.g., online chat) Scheduled synchronous sessions may be organized at the instructor’s discretion to demonstrate skills, address problems, and review asynchronous lectures. Synchronous sessions may also be used for students to work on problem sets together. The platform for such sessions may include ConferZoom or any other approved medium for synchronous dialog.

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
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100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular Asynchronous discussion boards will be used to encourage discussion among students where they can compare and contrast/ discuss /identify and analyze elements of course outcomes. Other Discussion boards will also be used for Q&A and general class discussion by students and instructor to facilitate student learning outcomes.
E-mail	Email, class announcements and tools such as “Message Students Who” and “Assignment Comments” in Canvas will be used to regularly communicate with all students to clarify class content, remind of upcoming assignments, and provide immediate feedback to students on coursework to facilitate student learning outcomes. Students will be given multiple ways to email instructor through Canvas inbox and faculty provided email account through their own canvas email and school email.

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Examinations

Hybrid (1%–50% online) Modality

On campus
Online

Hybrid (51%–99% online) Modality

On campus
Online

Primary Minimum Qualification

EARTH SCIENCE

Review and Approval Dates

Department Chair

11/11/2021

Dean

11/12/2021

Technical Review

11/18/2021

Curriculum Committee

12/07/2021

DTRW-I

MM/DD/YYYY

Curriculum Committee

MM/DD/YYYY

Board

MM/DD/YYYY

CCCCO

MM/DD/YYYY

Control Number

CCC000434371

DOE/accreditation approval date

MM/DD/YYYY

