GEOL 11 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: GEOL 11 Title: GEOLOGY OF CALIFORNIA
Full Title: Geology of California
Last Reviewed: 4/10/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
Students will be introduced to geologic principles and processes that formed and continue to influence California's geologic and tectonic environment. This course provides an overview of the formation and interpretation of rocks, volcanoes, earthquakes, plate tectonics, and the geologic history of California.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 1A or equivalent

Limits on Enrollment:

Schedule of Classes Information:
Description: Students will be introduced to geologic principles and processes that formed and continue to influence California's geologic and tectonic environment. This course provides an overview of the formation and interpretation of rocks, volcanoes, earthquakes, plate tectonics, and the geologic history of California. (Grade or P/NP)
Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 1A or equivalent
Limits on Enrollment:
Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B1	Physical Science	Fall 2007	
IGETC:	**Transfer Area**		Effective:	Inactive:
	5A	Physical Sciences	Fall 2007	

CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:
CID Descriptor: GEOL 200 Geology of California
SRJC Equivalent Course(s): GEOL11

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Apply scientific methodologies to answer scientific questions.
2. Evaluate and classify earth materials.
3. Identify, locate, and interpret significant geologic and geomorphic features of California.
4. Identify and explain processes that have formed and continue to shape the landscape of California.5. Recognize the complex interplay between humans and the environment.

Objectives:
At the conclusion of this course, the student should be able to:
1. Define the nature of geology as a science.
2. Utilize Plate Tectonic theory to summarize the relationships among the rock cycle, tectonic setting, volcanism and earthquake activity, and provide examples illustrating these relationships.

3. Describe the lithologies and formation of igneous, sedimentary, and metamorphic rocks.
4. Use classification charts to identify major rock types and sub-types.
5. Classify and illustrate several types of volcanic features and locate volcanic features within California.
6. Explain the causes, effects, and measurement scales of earthquakes.
7. Summarize the history of the San Andreas Fault system.
8. Evaluate geologic hazards common to California and their effect on humans.
9. Reconstruct the geologic evolution of California in relation to the geologic time scale.
10. Describe surface processes and identify the features associated with each process; provide specific examples of locations in California exhibiting these landforms.

11. Give examples of geological resources currently tapped in California, identify their location, geological formation, and interpret future resource exploration opportunities in California (optional).

Topics and Scope:

I. Introduction
- A. Scientific method
- B. Plate tectonic theory
- C. Structure of the Earth
- D. Geomorphic provinces of California

II. Earth Materials
- A. Minerals and rocks
- B. The rock cycle and formation of rocks
- C. Igneous rocks
  1. Processes, textures, and mineralogy
  2. Classification
  3. Plutonic rocks in California; the Sierra Nevada, Klamath, and Peninsular Ranges
  4. Volcanoes, volcanic processes, and hazards in California; the Cascades and Modoc Plateau
- D. Sedimentary rocks
  1. Weathering and erosion
  2. Processes, textures, and compositions
  3. Classification
  4. The Great Valley Sequence and sedimentary rocks in California
- E. Metamorphic rocks
  1. Processes, textures, and mineralogy
  2. Classification
  3. The Coast Ranges and metamorphic rocks in California

III. Faults
- A. Fault types
- B. Plate movements and plate tectonic theory
- C. San Andreas Fault system

IV. Earthquakes
- A. Elastic rebound theory
- B. Seismic waves
- C. Intensity and magnitude measurement scales
- D. Seismic data interpretation for earthquake forecasting and hazards/risk assessment
- E. Epicentral location
- F. Historically significant earthquakes in California

V. Geologic Time
- A. Relative vs. absolute dating methods
- B. Development of the geologic time scale
- C. Paleontology and dating using fossils
- D. Introduction to common fossils of California

VI. Geologic Evolution and Formation of California
- A. Precambrian history
  1. Precambrian rock units and fossils in California: Basin and Range and Mojave Desert
  2. Changing continental margin
- B. Paleozoic history
  1. Paleozoic rock units and fossils in California: Basin and Range, Mojave Desert, Sierra Nevada, and Klamath Mountains

2. Changing continental margin
C. Mesozoic history
1. Mesozoic rock units and fossils in California: Sierra Nevada, Great Valley, and Coast Ranges
2. Orogenic events
3. California's major growth spurt
D. Cenozoic history
1. Cenozoic rock units and fossils in California
2. Extension in the Basin and Range
3. Rotation in the Transverse Ranges
4. Formation of the San Andreas Fault system
VII. Surface Processes and Landforms
A. Coastal processes and California's coastline
B. Glacial processes and the glacial history and features of California
C. Desert processes and desert landforms in California
VIII. Geologic Resources Located in California (at least 2 of the following topics)
A. Water
1. Water rights
2. Groundwater
3. Surface water
B. Rocks and minerals
C. Petroleum
D. Geothermal

Assignment:

1. Weekly readings (20-30 pages or online equivalent)
2. Research, reaction, or summary paper(s) (0-4)
3. Homework (written and problem-solving exercises) (weekly or per unit)
4. Oral presentation(s) (0-2)
3. Exam(s) (0-4)
4. Quiz(zes) (0-15)
5. Class participation, including: activities, discussions, group work

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Research, reaction, or summary paper(s); homework	Writing 10 - 60%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework	Problem solving 5 - 30%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Exam(s); quiz(zes)	Exams 0 - 50%

Other: Includes any assessment tools that do not logically fit into the above categories.

Oral presentation(s); class participation	Other Category 0 - 40%

Representative Textbooks and Materials:
California's Amazing Geology. Prothero, Donald. CRC Press. 2017 (classic).
Introduction To Water in California. 2nd ed. Carle, David. University of California Press. 2015 (classic).
Geology Of The San Francisco Bay Region. Sloan, Doris and Karachewski, John. University of California Press. 2006 (classic).
California Geology. 2nd ed. Harden, Deborah. Pearson. 2004 (classic).
A Dangerous Place: California's Unsettling Fate. Reisner, Marc. Penguin Books. 2004 (classic).
Assembling California. McPhee, John. The Noonday Press. 1995 (classic).
Cadillac Desert: The American West and Its Disappearing Water. Reisner, Marc. Penguin Books. 1993 (classic).
Instructor prepared materials