

CATALOG INFORMATION

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Dept & Nbr: EAS 210 Title: GEOLOGY OF CALIFORNIA

Full Title: Geology of California

Units	Course Hours	Per Week	Nbr of Weeks	Course Hours	Total
Max: 4.0	Lecture	3.0	17	Lecture	51.0
Min: 4.0	Lab	3.0		Lab	51.0
	Contact DHR	0.0		Contact DHR	0.0
	Contact Total	6.0		Contact Total	102.0
	Non-contact DHR	0.0		Non-contact DHR	0.0

Title 5 Category: 01 AA Degree Applic
Grading: GC Credit course for grade or CR/NC
Repeatability: 00 No repeatability allowed or defined
Also listed as:

CATALOG DESCRIPTION:

This course focuses on the theory of plate tectonics and earthquake seismology in order to explore the geologic history of California. The varied landscapes and rocks of California are viewed within the plate tectonic model, and the geologic provinces that are associated with various aspects of plate tectonic activity are presented to illustrate the evolution of California through geologic time.

PREREQUISITES:

COREQUISITES:

RECOMMENDED PREPARATION:

ENG 80 or qualification for ENG 200 through the assessment process.

LIMITS ON ENROLLMENT:

SCHEDULE OF CLASSES INFORMATION:

Recommended: ENG 80 or qualification for ENG 200 through the assessment process.

California's geology is a grand showcase for the theory of plate tectonics and earthquake studies. This course illustrates the varied history of California as it formed, changed, and is still being changed today by large scale plate tectonic processes. The geologic history of California is described through characterization of the various rock types and structures seen in this unique environment. Required field trips may be scheduled.

(Grade or CR/NC)

Transfer Credit: UC.

ARTICULATION and CERTIFICATE INFORMATION

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ASSOCIATE DEGREE: Effective: FALL 2004 Inactive:
 Area: A NATURAL SCIENCES

CSU GE: Effective: SPRING 2005 Inactive:
 Transfer area: B1 PHYSICAL UNIVERSE
 B3 LAB ACTIVITY

IGETC: Effective: SPRING 2006 Inactive:
 Transfer area: 5A PHYSICAL SCIENCES

CSU TRANSFER: Effective: Inactive:

UC TRANSFER: TRANSFERABLE Effective: FALL 2004 Inactive:

CAN:

CERTIFICATE APPLICABLE: N NOT CERTIFICATE/MAJOR APPLICABLE

APPROVAL AND DATES

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Version 02 Submitted by: STEVE CARDIMONA Date: 09/20/2005
 Department approved: Catherine Indermill Date: 09/26/2005
 Curriculum approved: 02/20/2004 Version approved: 09/23/2005
 Prerequisites approved: 02/20/2004 Last reviewed: 09/23/2005
 Term effective: FALL 2006 Last taught: FALL 2007 Inactive:

COURSE CONTENT

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OUTCOME AND OBJECTIVES:

1. Analyze cross-section of the Earth and determine relative age and geologic history of rocks.
2. Differentiate between different kinds of faults, their plate tectonic origin, and their associated deformation.
3. Describe various data types and their support of the plate tectonic theory.
4. Distinguish between different kinds of magmas and the associated volcanic activity.
5. Evaluate earthquake parameters including origin time and location, magnitude and intensity.
6. Identify plate tectonic processes and interpret the key effects of plate interaction.
7. Compare and contrast ocean and continental crust, and describe the significance with regard to rocks in California.
8. Identify the plate tectonic processes that produce various rock types found in California.
9. Develop a model for how California's geology represents various large-scale plate tectonic processes.
10. Differentiate between the plate tectonic processes acting in the past and those acting now in California.
11. Formulate reasonable ways to address critical tectonic hazards in Northern California.
12. Define emergent coastal processes and illustrate how these affect

Northern CA Coast.

13. Determine various geologic processes at work to create California's deserts and valleys.

TOPICS AND SCOPE:

1. Fundamentals of plate tectonics and earlier theories.
2. Basic geological concepts, including rock formation.
3. Faulting and folding of rocks.
4. Details of plate tectonics and supporting data.
5. Igneous activity, volcanoes and tectonic implications.
6. Earthquake seismology and the interior of the earth.
7. California's tectonic history and modern ideas of exotic terranes.
8. Transform faulting and the San Andreas Fault.
9. Geologic provinces of California.
10. Processes at work on California's coast.
11. California's deserts and the Basin and Range province.
12. Glaciation and California.
13. Geologic hazards in California.
14. Earthquake seismology and California.

ASSIGNMENTS:

READING ASSIGNMENTS:

Appropriate reading assignments will be given from college level text(s). A variety of media may be used to supplement textbook readings, such as:

1. Current news articles from local or regional papers.
2. Reports, news articles, or other documents from internet sources.
3. Documents by government agencies such as the California Geological Survey.

WRITING ASSIGNMENTS:

Appropriate writing assignments will be given which allow students to demonstrate their understanding of key concepts, present critical review of reading materials, and describe the application of course topics to the analysis of specific problems. Assignments will include:

1. Analytical semester project that requires the application of graphic and descriptive analysis to plate tectonic problems.
2. Short essays involving written critiques and comparisons of geologic concepts and terminology.
3. Summaries of laboratory exercises.

Additional writing exercises may be assigned such as:

1. Term paper on topic of interest to student but focused on clarifying geologic concepts in a specific California geomorphic setting.
2. Reviews of news and/or research reports from entities such as the California Geological Survey.
3. Essay examination.

OUTSIDE ASSIGNMENTS:

Out of class assignments are required. These assignments will allow students to take a more in-depth look at course topics and will include:

1. Reading and writing assignments as specified in the course syllabus.
2. Analytical semester projects that require the application of graphic and descriptive analysis to plate tectonic problems.
3. Summaries of laboratory exercises and related research-oriented questions addressing lab topics.
4. Summaries of observations during instructor guided and self-guided

field trips.

Additional assignments may be included in the course, such as:

1. Assigned/recommended attendance at guest speaker lectures.
2. Viewing of assigned/recommended media materials.
3. Library, electronic, and other research on a variety of plate tectonic and/or seismological subjects.
4. Term paper on topic of interest to student but focused on clarifying geologic concepts in a specific California geomorphic setting.
5. Reviews of news reports or research reports from entities such as the California Geological Survey.

LAB ASSIGNMENTS:

Laboratory time will allow students to more deeply study topics brought out in lecture, as well as touch on aspects of geological problem solving that cannot be addressed well in the lecture setting. Key laboratory topics:

Introductory topics: Background geology and introduction to tectonics

- Rocks and the rock cycle
- Basic geologic structures
- Geologic time, age dating rocks

Geophysical data analysis topics: paleomagnetism and seismology

- Paleomagnetic reversals spreading rate determination at mid-ocean ridges and reversals and spreading
- Seismicity and tectonics
- Estimating plate motion using geologic evidence
- Earthquake first-motion data analysis and faulting
- Earthquake location in space
- Earthquake magnitudes and tectonic energy
- Earthquake intensity and surface geology
- Earthquake hazards
- Correlation of California seismicity, fault locations, rock type distribution and topography

METHOD OF INSTRUCTION:

Methods of instruction will include:

1. Lecture and visual aids
2. Quiz and examination review performed in class
3. Homework and extended projects
4. Collaborative projects and lab-oriented problem solving
5. Field observation during field trips

Additional instruction may include:

1. Discussion and problem solving performed in class
2. Guest speakers
3. Optional materials available for review in the Learning Center and/or library

METHODS OF EVALUATION:

A student's grade shall be determined based on demonstrated proficiency in the subject matter and the ability to demonstrate that proficiency, at least in part, by means of essays and problem-solving exercises including: 1) In class objective examinations that test for knowledge and applications of specific geologic concepts. 2) Out of class writing assignments that test the knowledge and application of plate tectonic principles as applied to California. 3) Summaries of laboratory problem-solving exercises. 4) Summaries of field trips. Proficiency in the subject matter may be measured through supplementary assignments/activities such as: 1) Take home essay assignments and/or examinations. 2) Analytical semester projects. 3) Research papers. 4) Participation in group projects. 5) Class participation

including oral presentations on a variety of plate tectonic subjects.

BASIS FOR GRADING:

The assignment of a grade is based on the level of achievement of the outcomes and objectives of the course outline and is reflected in quantifiable terms in the course syllabus.

REPRESENTATIVE TEXTBOOKS:

1. California Geology, 2nd edition, by Deborah R. Harden, Pearson Education (Prentice Hall), 2004, ISBN: 0-13-100218-X.
2. Earthquakes by Bruce Bolt, W.H. Freeman (Worth Publishers), 2003, ISBN: 0-7167-5618-8.
3. Lab materials (rocks, maps, data, handouts) provided by instructor.

REASON FOR REVISION

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Course outline modified to include specific laboratory content for General Education: CSU: Area B3.

RESOURCES REQUIRED

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MISCELLANEOUS

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Advisory generate desc:	N	NO
Area department:	GEL	GEOLOGY
Audit flag:	N	NOT AUDITABLE
Basic skills:	X	NOT BASIC SKILLS
Classification:	A	Liberal Arts and Sciences
Cost level:	01	
Disciplines:		GEOLOGY
Division:	02	MERIDITH RANDALL
Faculty service areas:		GEOLOGY
Fee:	\$0.00	
In-service:	X	NOT IN-SERVICE
Level below transfer:	X	NOT APPLICABLE
Matric-requiring:	X	Exempt from assessment
Maximum class size:	0	
Maximum wait list:	0	
Method of instruction:	03	LECTURE/LABORATORY
Non-credit category:	X	NOT APPLICABLE, CREDIT COURSE
Open entry/exit:	N	Not open entry/exit
Pacs activity:	1914	GEOLOGY
Pacs program project:	0000	
Preq/coreq generate desc:	N	NO
Preq/coreq provisional:	N	NO
Preq/coreq reg check:	N	NO PREREQUISITE RULES EXIST
Repeat group id:		
Requires instructor sig:	N	INSTRUCTOR'S SIGNATURE NOT REQUIRED
SAM classification:	E	Non-occupational
Selected/special topic:	N	NOT A SELECTED TOPIC COURSE
Special class:	X	NOT A SPECIAL COURSE
TOP code:	1914.00	GEOLOGY
Workload:	0.0000	