

CATALOG INFORMATION

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Dept & Nbr: EAS 208 Title: ENVIRONMENTAL GEOLOGY

Full Title: Environmental Geology

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:

Introduction to human interaction with the Earth, with a specific focus on scientifically characterizing geologic processes at the Earth's surface and how humans are affected by, and have in some cases modified those processes. This course introduces the basic science and math concepts we use to understand important topics in geologic hazards including volcanoes, landslides, earthquakes, coastal processes, stream processes and flooding. In addition, scientific principles are applied to important problems related to groundwater, energy resource management and land use that have faced every civilization over time, but are becoming much more critical to life on this planet as human population and resource use increase.

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.

Introduction to geologic processes at the Earth's surface and how humans are affected by, and have in some cases modified those processes. Topics cover a wide spectrum from geologic hazards to energy and resource management.

Required field trips may be scheduled on weekends. (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: FALL 2004 Inactive:
 Transfer area: B1 PHYSICAL UNIVERSE
 B3 LAB ACTIVITY

IGETC: Effective: SPRING 2005 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 01 Submitted by: STEVE CARDIMONA Date: 11/20/2003
 Department approved: Date:
 Curriculum approved: 10/31/2003 Version approved: 10/31/2003
 Prerequisites approved: 10/31/2003 Last reviewed: 10/31/2003
 Term effective: FALL 2004 Last taught: Inactive:

COURSE CONTENT

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OUTCOME AND OBJECTIVES:

1. Use math techniques and geologic principles to analyze the forces on hill-slopes that trigger landslides
2. Differentiate between different kinds of faults, their relative motion, and their associated deformation
3. Describe soil stability with material properties and determine earthquake shaking hazards
4. Distinguish between different possible magma chemistry and the associated volcanic activity
5. Define natural geologic coastal processes and illustrate how these are affected by human development
6. Identify stream processes and interpret the key affects of flooding using principles of fluid flow
7. Evaluate groundwater characteristics as they relate to resource use by applying geologic principles
8. Develop a model for surface stability/hazard based on groundwater and subsurface geologic characteristics
9. Identify the geologic processes that produce mineral resources and assess human extraction techniques
10. Differentiate between the key geologic processes that produce fossil fuel resources
11. With basic scientific principles, formulate reasonable extraction techniques for various fossil fuel reserves
12. Compare and contrast the scientific benefits of hydroelectric, wind

and geothermal energy

13. Prioritize the alternatives to fossil fuels based on specific physical, chemical and geologic concepts

TOPICS AND SCOPE:

1. Slope stability and landslides
(scalars, vectors and material properties)
2. Faulting, earthquake hazards and engineering
(material properties and relative motion)
3. Igneous activity and volcanoes
(chemical composition)
4. Coastal processes and coast development
(waves and energy, material transport)
5. Hydroelectric energy, flood plain development and flooding
(surface processes, statistics and land use)
6. Groundwater characterization and use, and geothermal energy
(material properties and fluid flow)
7. Energy and mineral resources, location and extraction
(chemical properties, geologic history, land use)

ASSIGNMENTS:

READING ASSIGNMENTS:

Appropriate reading assignments will be given from college level text(s).

A variety of media may be used to supplement textbook reading, such as:

1. Current news articles from local, regional or national papers
2. Reports, news articles or other documents from internet sources
3. Documents by government agencies such as the US 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. Term paper on topic of interest to student but focused on clarifying geologic concepts in a specific environmental setting
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. Analytical semester projects that require the application of graphic and descriptive analysis to geologic problems
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. Term paper on topic of interest to student but focused on clarifying geologic concepts in a specific environmental setting
3. Observations through instructor guided and self guided field trips

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

1. Assigned/recommended attendance at guest speaker lecture
2. Viewing of assigned/recommended media materials

3. Library, electronic, and other research on a variety of geologic subjects
4. Analytical semester projects that require the application of graphic and descriptive analysis to geologic problems
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 environmental geology problem solving that cannot be addressed well in the lecture setting.

Example laboratory topics and field trips:

Section One:

- Tectonics, EQ's, volcanoes, water resources
- Basic minerals and rocks labs
- Basic geologic structures lab
- Field trip to the geysers geothermal area

Section Two:

- Surface processes, soil/mineral resources
- Slope stability lab
- Field trip to landslide site
- Mineral resources lab
- Groundwater and water pollution labs
- Field trip to Sulphur Bank Mine

Section Three:

- Climate, energy resources, Environmental Law and land-use planning
- Fossil fuels and alternative energy labs
- Soils lab(s)
- Rivers and coasts labs
- Field trip to Mendocino Coast

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 for knowledge and application of geologic principles as applied to environmental topics

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 geologic 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. Environmental Geology, by Carla Montgomery, McGraw Hill, 2000.
2. Environmental Geology, by Edward Keller, Prentice Hall, 1999.
3. Laboratory Exercises in Environmental Geology, 2nd Ed., by Harvey Blatt McGraw Hill, 1998.
4. Hazard City: Assignments in Applied Geology, 2nd Ed., by Hobart M. King Prentice Hall, 2005.

RATIONALE

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Outline modified to include specific outcomes for laboratory component, and to stress the emphasis on basic scientific and mathematical principles.

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:	00	VALUE NOT FOUND
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