

GEOL 108Lg
Spring, 2018: TTh 11-12:20

Crises of a Planet
Prof. Hammond

Synopsis: Earth is a dynamic planet. As a consequence of these dynamics, natural disasters occur that influence the habitability of the planetary surface that we inhabit. Earthquakes, volcanic eruptions, floods, landslides and climate change occur episodically. This course will consider causes, consequences and predictability of these events. During the past few centuries, human activities have had increasing impact on the behavior of the surface environment, as our growing population has utilized increasing quantities of water, energy, and minerals. These impacts also perturb the stability of the planetary environment, creating a new level of crises that must be faced by coming generations.

COURSE OUTLINE

approx. # of lectures

- | | | |
|------|--|---|
| I. | <u>The Earth</u> | 6 |
| | a. Internal structure and composition | |
| | b. The rock cycle | |
| | c. Plate tectonics | |
| | d. California geology | |
| | e. Biogeochemical Cycles | |
| | f. Mass Extinctions | |
| II. | <u>Geologic Hazards</u> | 7 |
| | a. Geomorphology - faults, erosion, deposition | |
| | b. Earthquakes - causes, effects, prediction | |
| | c. Volcanic eruptions - past, future | |
| | d. Mass movement - landslides, subsidence | |
| | e. Coastal problems - tsunamis, erosion | |
| | f. Floods - hydrologic cycle, runoff, erosion, siltation (2) | |
| III. | <u>Natural Resources</u> | 7 |
| | a. Surface Water | |
| | b. Ground Water | |
| | c. Minerals and building materials | |
| | d. Hazards of Mining | |
| | e. Energy - fossil fuel | |
| | f. Energy - nuclear, hydro, solar, geothermal | |
| | g. Soil and Agriculture | |
| IV. | <u>Environmental Problems</u> | 7 |
| | a. Toxic chemicals | |
| | b. Sewage disposal, Solid waste disposal | |
| | c. Nuclear waste disposal | |
| | d. Acid rain and smog | |
| | e. CO ₂ and Climate (3) | |

TEXT: Pipkin ,Trent, Hazlett and Bierman; Geology and the Environment, Cole/Brooks Publ. 7th ed Ebook is about \$25; 6th ed. paperback is also ok and less than bound 7th ed.

GRADING: 2 Midterms, 20% each; Final 25%; Laboratory 25%; Field Trip 10%.. You must pass the lab component to pass the course. For P/NP option, P requires a C or better.

OFFICE HOURS: MWF 11-12 A.M., or by apt.; ZHS 325E, x05837, dhammond@usc.edu

FIELD TRIP: Sunday March 25 or Saturday March 31 8:00 A.M. - 5:00 P.M.

108Lxg READING LIST (pages to be added)

<u>Date</u>	<u>Topic</u>	<u>Chapter</u>
Jan. 9	Introduction: Planet Earth	1
11	Building Blocks: Atoms, Minerals, and Rocks	3
16	Plate Tectonics	4
18	California Geology and the San Andreas Fault	4
23	Earth Systems and Biogeochemical Cycles	TBA
25	Crises: Mass Extinctions	TBA
30	Geomorphology: Finding Faults	6
Feb. 1	Earthquakes: Seismology, Hazards & Prediction	4
6	TBA	
8	Exam 1	
13	Mass Movement: Mountains that move\	7
15	Subsidence: Swallowed Alive	TBA
20	Vanishing Coastlines, Storms, Tsunamis	10
22	Water from the Sky: Why does it rain?	8
27	Rivers and Mud	9
Mar. 1	Floods and Dam Disasters	8
6	California Water Wars and Mono Lake	
8	Groundwater and Water Resources	8
20	Mineral Resources: Gold and Sand	13
22	Mining Hazards: Shafted again	13
27	<u>EXAM II</u>	
29	Coal, Oil and Gas: Plant Power	14
Apr. 3	Other Energy Resources	14
5	Dirt and Diet	6
10	Toxic Wastes	15
12	Sewage and Trash: After the Flush or Curb	15
17	Radioactivity: Bombs, Waste, Hazards	15
19	Global Climate Dynamics	2
24	CO ₂ and Your Future	2
26	Smog, Acid Rain, Ozone	2

GEOLOGY 108 Tentative LAB SCHEDULE

REMEMBER TO READ EXERCISES BEFORE LAB

<u>Week Beginning*</u>	<u>Topic</u>
Jan. 8	Self-Guided visit to LACMNH
15	Minerals and Rocks
22	Plate Tectonics
29	Topographic Maps
Feb. 5	Earthquakes
12	Volcanoes
19	Landslides and Mass Wasting
26	Coastal Hazards
Mar. 5	Surface Water and Floods
12	Spring Break
19	Groundwater and Water Resources
26	Toxic Materials and Waste
April 2	Mineral Resources
9	TBA
16	Climate
23	Lab Final

Field Trip on San Andreas: March 25 (Sunday) or March 31 (Saturday) 8:00 A.M. - 5:00 P.M.

Lab Handouts will be given out each week.

TAs: TBA SCI 300 x06743
 TBA SCI 209 x07653

Lab Sections: 24862 W 10-11:50 ZHS B56
 24863 F 10-11:50 ZHS B56
 24864 W 12- 1:50 ZHS B56
 24866 F 12- 1:50 ZHS B56
 24867 T 2- 3:50 ZHS B56
 24868 W 2- 3:50 ZHS B56
 24871 Th 2- 3:50 ZHS B56
 24875 T 4- 5:50 ZHS B56

Academic Accommodations: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP can be reached at ability@usc.edu and is open 8:30am-5:00pm Monday through Friday. The phone number for DSP is 213-740-0776.