CEE 70 ENGINEERING GEOLOGY
Fall Semester 2014

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Textbook: *Earth:Portrait of a Planet*, 4th Edition, by Stephen Marshak, Norton & Co., NY, publishers (also available as a flash based e-book which will not run on iOS and even some Android tablets…so pretty useless, since you cannot share it among devices or resell it)
Focus will be on covering the highlights of one or two chapters each week. The textbook is oriented toward the scientific aspects of the earth science, while the lectures will highlight the practical, engineering and environmental aspects of earth science. The different topics will be illustrated with slides, lecture demonstrations and video presentations during lectures.

Prerequisite: Chem 1A or equivalent, may be taken concurrently.

Field Trip: A day-long field trip will be held on *Saturday, Nov. 1 (Last name starting with A-M)* and *Sunday, Nov. 2 (N-Z).*
Attendance on this field trip is required.

Laboratory Sessions:

101 Tu 5-7 PM in 544 Davis	**104** W 2-4 PM in 544 Davis
102 W 5-7 PM in 544 Davis	**105** M 5-7 PM in 544 Davis
103 Th 5-7 PM in 544 Davis	

The function of the laboratory sessions is to provide opportunity for hands-on learning. The material covered is essential to understanding of the material and augments the lecture material. Each student is responsible to learn the basic rocks and minerals and pass a rock identification test.

Exam Format: Exams will be based on a multiple choice answer format with some short answer questions.

Grading:

Rock Quiz:	15 (Week 8 tentative)
Midterm:	25
Field Trip:	10
Homework/Labs:	15
Final:	35

Final Exam: Exam group 17 Friday, Dec 19, 2013, 8-11 AM.

University of California Department of Civil and Environmental Engineering

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Week	Date	Lecture Topics	Reading
1	Tu, Aug 26	-----	
	Th, Aug 28	Introduction	Chapter P1-1
2	Tu, Sept. 2	Earth Systems, Structure of the Earth	Chapter 2-4
	Th, Sept. 4	Rock Cycle/Rock Forming Minerals,	Chapter 5
3	Tu, Sept. 9	Igneous Processes and Rocks	Chapter 6
	Th, Sept. 11	Volcanism; Volcanic Rocks	Chapter 9
4	Tu, Sept. 16	Sedimentation-Sedimentary Rocks	Chapter 7
	Th, Sept. 17	Carbonates/Karst and Evaporites	Chapter 7,19.8
5	Tu, Sept. 23	Metamorphism-Metamorphic Rocks	Chapter 8
	Th, Sept. 25	Geologic Time Scale - Age Dating	Chapter 12
6	Tu, Sept. 30	Weathering and Erosion	Chapter 7
	Th, Oct. 2	Slope Processes - Mass Wasting	Chapter 16
7	Tu, Oct. 7	Streams and Stream Processes	Chapter 17
	Th, Oct. 9	Coastal Processes	Chapter 18
8	Tu, Oct. 14	Groundwater	Chapter 19
	Th, Oct. 16	Midterm	
9	Tu, Oct. 21	Deserts and Wind	Chapter 21
	Th, Oct. 23	Glaciers and Glacial Deposits	Chapter 22
10	Tu, Oct. 28	Deformation of Rocks	Chapter 11
	Th, Oct. 30	Geologic Maps and Structural Geology	Handout
	Nov. 1, Sat.	*Field trip A 8:30 am – 5 pm – SF Bay Area*	
	Nov. 2, Sun.	*Field trip B 8:30 am – 5 pm – SF Bay Area*	
11	Tu, Nov. 4	Structural Geology	Chapter 11
	Th, Nov. 6	Faulting and Seismicity	Chapter 10
12	Tu, Nov. 11	Veterans Holiday	
	Th, Nov. 13	Earthquakes and Earthquake Damage	Slides
13	Tu, Nov. 18	Dams – Design, Construction, Impact	Slides
	Th, Nov. 20	Tunnels and Underground Space	Chapter 14-15
14	Tu, Nov. 25	TBD (Energy Policy and Fuels)	Chapter 14-15
	Th, Nov. 27	*Thanksgiving Recess*	
15	Tu, Dec. 2	Resources and Energy	
	Th, Dec. 4	CA Water Systems – Challenges for Sustainability	Slides
16	Tu, Dec. 9	Global Warming and Sustainability	23
	Th, Dec. 11	Review	
	Fri. Dec. 19	Final Exam (Group 17) 8-11 AM	

CE 70 Fall 2014 Laboratory Topic Schedule

Week	Topic/Project
1&2	No Lab
3	**Introduction to Rock forming Minerals** - Review of mineral structures, physical properties used for mineral identification.
4	**Rock forming Minerals**, contd. – See above
5	**Igneous Rocks** – Study of mineral assemblages found in igneous rocks and igneous rock classification, review of engineering issues commonly encountered in igneous rock masses.
6	**Sedimentary Rocks** – Study of sedimentary rock textures, structures and classification including discussion of sedimentary environments. Review of engineering issues commonly encountered in sedimentary rock masses.
7	**Metamorphic Rocks** – Study of metamorphic rock textures and mineralogy for classification, including discussion of metamorphic grades, facies and mineral assemblages as an indicator for stress history and tectonic setting.
8	**Review**
9	**Rock Quiz**
10	**Air Photos and Remote Sensing** – introduction to air photo review and stereoscopic coverage. Remote sensing technologies and their use.
11	**Groundwater and Potentiometric Surfaces** – review of head distribution in an aquifer system. Water level measurements and interpolation of water levels to estimate the potentiometric surface of an aquifer.
12	**Structural Geology** – Review of principles of structural geology, strike & dip measurements, and solution of 3-point problems and projection of outcrops on topography
13	**Geologic Mapping and Cross Sections** – Discussion about geologic maps and use of geologic information to develop and interpret geologic cross-sections. Map project will include developing topographic profiles, transferring geologic information and cross-section development
14	**No labs**
15	**UCB and the Hayward Fault** – Walking tour of the Hayward Fault as it crosses campus. North and south sides of the stadium and Dwight street curb offsets.