

# CEE 70 ENGINEERING GEOLOGY

FALL SEMESTER, 2017. TUES. - THURS. 8 AM TO 9:30 AM, 309 HEARST MEMORIAL MINING BUILDING

Professor: Steven Glaser 621A Sutardja Dai Hall (CITRIS building)  
Office Hours: Mon. 9 – 10 AM  
Wed. 4:15 – 5:15 PM  
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Talented Assistants: Lilian Lorincz [lilian\\_lorincz@berkeley.edu](mailto:lilian_lorincz@berkeley.edu)  
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Textbook: Earth, Portrait of a Planet, 5<sup>th</sup> ed., by Stephen Marshak, W.W. Norton.

The practical aspects of the interaction of civil engineering, the earth, and sustainability are examined. The topics are illustrated with slides, lecture demonstrations and video presentations during lectures. Focus will be on covering the highlights of one or two text chapters each week.

Laboratory Sessions: **Tu** 5:00PM - 6:59PM; **We** 3:00PM - 4:59PM; **We** 5:00PM - 6:59PM; **Th** 3:00PM to 4:59PM; **Th** 5:00PM - 6:59PM  
all in 410 Davis

The function of the laboratory sessions is to provide opportunity for hands-on learning of rock and mineral identification, map reading, structural geology etc. The material covered will be supplementary to the lecture material.

Field Trip There is a mandatory field trip. There is an assignment due for the field trip that must be handed in. The trips start at about 8:30am and will return to campus between 3 and 4pm. Due to the size of the class, there will be two field trips:

**Saturday**, Sept. 30: students A through L. Bay Area Geological Tour

**Saturday**, Oct. 14: students M through Z. Bay Area Geological Tour

Everyone should bring a lunch and snacks, light jacket

Exam Format: Exams will be based on a multiple choice answer format.

Grading:

Rock Quiz:	15%
Midterm:	25%
Field Trip:	10%
Homework/Labs:	15%
Final:	35%

Homework: : Sometimes assigned chapter review question submitted for check - no check, for later class discussion. Finding certain geologic features on Google Earth.

Final Exam: Thursday, December 14, 7 to 10 PM (Final Exam Group 16)

## SYLLABUS FOR CE 70; FALL, 2017

Week	Topic	Chapter
1	Introduction	Slides
	Geologic Time Scale	Chapter 12 & 13
	Structure of the Earth	Chapters 1 & 2
2	Plate Tectonics	Chapter 3 & 4
3	Rock Forming Minerals	Chapter 5, Interlude A
	Igneous Processes	Chapter 6
4	Igneous Rocks	Chapter 6
	Volcanism, Volcanic Rocks	Chapter 9
5	Sediments and Sedimentary Rocks	Chapter 7
	Sediments and Sedimentary Rocks	Chapter 7
6	Metamorphism - Metamorphic Rocks	Chapter 8
	Metamorphism - Metamorphic Rocks	Chapter 8
	Deformation of Rocks and the Earth	Chapter 11
7	Soils, Weathering, and Erosion	Interlude B, C
	Rivers and Stream Processes	Chapter 17
8	Groundwater	Chapter 19
	Groundwater Resource Management– Challenges for Sustainability	Chapter 19
9	<b>Mid-term Exam</b>	
	Deserts	Chapter 21
10	Oceans and Coastal Processes	Chapter 18
	Landslides and Mass Movements	Chapter 16
11	Glaciers and Ice Ages	Chapter 22
	Atmosphere and weather	Chapter 11
12	Geologic Maps and Structural Geology	Chapter 1, handout
	Faulting and Seismicity	Chapter 10
13	Earthquakes and Earthquake Damage	Chapters 10 & 11
	Applications - Underground Space, CA water supply	Lecture
14	California Water	Lecture
<b>Thanksgiving</b>		
15	Resources, Energy Policy, and Fuels – Challenges for Sustainability	Chapter 14
	Global Warming and Sustainability	Chapter 15
<b>Thursday, December 14, 7 to 10 PM (Final Exam Group 16)</b>		

### CE 70 Fall 2010 Laboratory Topic Schedule

<u>Week</u>	<u>Topic/Project</u>
3	<b>Introduction to Rock forming Minerals</b> - Review of mineral structures, physical properties used for mineral identification.
4	<b>Rock forming Minerals</b> , contd. – See above
5	<b>Rock forming Minerals</b> , contd. – See above
6	<b>Igneous Rocks</b> – Study of mineral assemblages found in igneous rocks and igneous rock classification, review of engineering issues commonly encountered in igneous rock masses.
7	<b>Sedimentary Rocks</b> – Study of sedimentary rock textures, structures and classification including discussion of sedimentary environments. Review of engineering issues commonly encountered in sedimentary rock masses.
8	<b>Metamorphic Rocks</b> – 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.
9	<b>Rock Quiz</b>
10	<b>Air Photos and Landslide Mapping</b> – introduction to air photo review and stereoscopic coverage. Air photo reconnaissance for identification and delineation of landslides.
11	<b>Groundwater and Potentiometric Surfaces</b> – 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	<b>Source Water Protection</b> – Discussion of Source Water Protection wellhead protection zones. Implications of recharge/discharge zones on land use and water quality. Review of technical and institutional measures that can be used to address source water protection.
13	<b>Structural Geology</b> – Review of principles of structural geology, strike & dip measurements, and solution of 3-point problems and projection of outcrops on topography
14	<b>Geologic Mapping and Cross Sections</b> – 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
15	<b>Thanksgiving</b>