Geology of the National Parks
Geology 350

Spring 2002
W 19:00-21:15
Thornton Hall 513

Instructor information	Daytime phone: 650-736-1821
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This course meets your Segment II, Category A Physical Sciences G.E. requirement and the lab/field requirement.

OBJECTIVES OF THIS COURSE

This course presents basic geologic concepts through examples in our national parks and monuments. It illustrates how mountains, volcanoes, earthquakes, and other geologic phenomena result from processes that occur within or on the surface of the Earth. Students will be exposed to national park geology through plate tectonics, a framework that has revolutionized thinking in Earth Science. They will thus be given the tools to help them become critical observers and participants; to understand why landscapes and rocks in a given park are similar to those in other parks yet differ from those in others; and why the preservation of geologic features within national parks is important to appreciating natural science and how it relates to society and the environment.

REQUIRED READING

Required textbooks: *Geology of National Parks* by Harris, Tuttle, and Tuttle (5th ed.)
Earth: An Introduction to Physical Geology by Tarbuck and Lutgens (7th ed.)

Recommended reading: *Geology Underfoot in Death Valley and Owens Valley*
by Sharp and Glazner

You should at least scan the readings listed on the next page *before* class and you are expected to read everything assigned in preparation for the exams. There is a significant amount of reading required for this course — please note that for some of the reading assignments listed below, I will only ask you to "scan" certain portions of chapters. I will make announcements in class about which portions of the reading assignments are required and which are scannable. On the exams, you will *not* be responsible for any historical information relating to the National Parks - only the geology. Please bring your textbooks or the pertinent sections to class with you.

TERM PROJECT

You will be required to complete a small research project on a National Park or Monument in the U.S. The goal of the project is to plan a trip to one of our national parks, describe the history of the park, and summarize the main geologic features you will see there. Details will follow later in the semester.

FIELD TRIPS

There are two field trips associated with this class — a 5-day field trip to Death Valley over spring break and an all-day Saturday trip to Point Reyes. You must attend the field trips to get credit for this course. You will be expected to bring, borrow, share, or buy the required equipment for camping and hiking (I will provide a list of items to bring later). You will be required to get out of the vehicles and hike around — nothing too strenuous for anyone who is in reasonable shape (see me if you have any questions). There will be some nominal fees that I will collect to cover our expenses for the field trips; the total should be less than $100 each, but I can't promise until later in the semester.

ATTENDANCE

It is very important that you attend class — I will cover material that is not in the textbook (that you will be responsible for on the exams) and you will enjoy this class much more if you show up (and you will end up doing less work outside class if you attend every lecture).

MISSED CLASSES AND EXAMS

Please let me know *before* class if you will miss class, be late, or need to leave early. You must take exams during class on the scheduled day. If for some reason you need to miss an exam, you should contact me before the exam and schedule a time to meet to make further arrangements. Make-up exams will be given only in cases of genuine, officially documented need.

GRADE WEIGHTING

Midterm exam #1	100 points
Midterm exam #2	100 points
Final exam	200 points
Term project	150 points
Death Valley field trip *(participation & written assignment)*	150 points
Point Reyes field trip *(participation & written assignment)*	50 points
Total possible points	750 points

WEB RESOURCES

U.S. Geological Survey

Geology in the Parks: [http://wrgis.wr.usgs.gov/docs/usgsnps/project/home.html]
Volcano information: [http://volcanoes.usgs.gov]
Earthquake information: [http://earthquake.usgs.gov]

National Park Service: [http://www.nps.gov]

Geological Resources Division: [http://www2.nature.nps.gov/grd/]
Geologist-in-the-Parks Program: [http://www2.nature.nps.gov/grd/geojob/index.htm]
Park (Virtual) Geology Tours: [http://www2.nature.nps.gov/grd/tour.index.htm]

Date	***Reading assignments****	***Lecture topics; Parks/monuments; scheduled exams***
Jan. 30th	—	Course logistics; Introduction to the National Parks History of the National Parks
Feb. 6th	[*E*]: Ch. 1, 17	Structure of the earth; Earth materials; Geologic time
Feb. 13th	[*E*]: Ch. 19	Plate tectonics **Term project instructions distributed**
Feb. 20th	[*E*]: Ch. 5 (p. 134-139), 6, 8 [*NP*]: p. 2-5; Ch. 1; Scan Ch. 2; 6	Geologic time Grand Canyon, Zion, Arches
Feb. 27th	[*E*]: Ch. 3, 4 [*NP*]: p. 432-435; Box 33.1, p. 440; Ch. 34-36	Active convergent margins Lassen, Crater Lake, Mount Ranier, Mount St. Helens, Katmai, Aniakchak
March 6th	Review for exam	**MIDTERM EXAM**
March 13th	[*E*]: Ch. 15, 18 (p. 497-500) [*NP*]: Ch. 43, 44, 46	Divergent margins; Passive margins Basin & Range, Death Valley, Mojave, Saguaro
March 20th	[*E*]: Ch. 10, 13 [*NP*]: Ch. 3 (p. 29-34), Ch. 9 (p. 118-126)	Water and wind; fluvial and desert features — Bryce Canyon, Zion, Badlands, Death Valley; Death Valley field trip preview
3/22-3/26	—	**Spring break - Field trip to Death Valley**
April 3rd	—	No class meeting
April 10th	[*E*]: Ch. 16	Transform boundaries — Point Reyes, Pinnacles
April 17th	[*E*]: Ch. 14 [*NP*]: Ch. 49	Coastline features - emergent vs. submergent Cape Cod, Cape Hatteras, Redwood, Point Reyes Point Reyes field trip preview
April 20th	—	**Point Reyes field trip (all day Saturday)**
April 24th	[*E*]: Ch. 4 (p. 126-127), Ch. 19 (p. 546-548) [*NP*]: Ch. 38, 39, 41	Hot spots Hawaii, Haleakala, Yellowstone, Craters of the Moon
May 1st	Review for exam	**MIDTERM EXAM**
May 8th	[*E*]: Ch. 12, 20 [*NP*]: p. 242-246; Box 27.1, p. 348; Ch. 23, 26, 29, 52; scan Ch. 22, 30-32, 47	Ancient convergent margins; Glaciers Kings Canyon, Sequoia, Rocky Mountain, Appalachian Trail, Shenandoah, Acadia, Glacier, Yosemite, Glacier Bay, Wrangell-St. Elias, Kenai Fjords, Denali, others not in your *NP* text
May 15th	Review midterms and field guides for final exam	**Term projects due at the beginning of class** Geology of the National Parks overview
May 22nd	Review for final exam	**FINAL EXAM** (Comprehensive)

*Readings listed below from *Geology of National Parks* (Harris, Tuttle, and Tuttle) are designated by [*NP*]; *Earth: An Introduction to Physical Geology* (Tarbuck and Lutgens) are designated by [*E*].