

**GEOLOGY 230**  
**GEOLOGY OF THE NATIONAL PARKS**

**BULLETIN INFORMATION**

GEOL 230 - Geology of the National Parks (3 credit hours)

**Course Description:**

An examination of the geologic setting and scientific significance of selected National Parks.

Note: Three lecture hours.

**SAMPLE COURSE OVERVIEW**

This is an introductory course in geology, with an emphasis on the Federal Park system, primarily the National Parks, but also including the Monuments, Seashores, etc. Material will include both general explanations of geologic processes, as well as specific examples from parks. The main objective is to familiarize students with geologic processes as exhibited in the National Parks and to put them in the context of park history and contemporary preservation. Geology is the study of the Earth (not just rocks), including its surface and interior, as well as the interactions with living organisms, including us. The most important concept to learn is that all things, even rocks, are constantly changing. The point of geology as a modern science is to understand the processes and rates whereby those changes occur.

**ITEMIZED LEARNING OUTCOMES**

**Upon successful completion of Geology 230 students will be able to:**

1. Demonstrate an understanding of and apply the basic principles, concepts, language and terms of Geology and the natural sciences through the exploration of the National Parks.
2. Demonstrate and apply an understanding of the scientific method using observation of the processes that formed the parks (erosion, glaciation, volcanism, faulting, among others), inquiry into the processes, formulation of hypotheses and experimentation to explain these natural processes.
3. Evaluate the relationships between the science related to the formation and preservation of the National Parks and its relationship to technology and society in preserving the historical context and identifying contemporary issues and maintaining the natural processes so that the Parks can be sustainable for generations to come.
4. Examine the sustainable practices that must be utilized to allow the beneficial interaction of society with the National Parks as specially preserved areas of the environment.

**SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS**

1. Geology of National Parks (6<sup>th</sup> Ed.); Harris, Tuttle & Tuttle

- a. The text may be supplemented with other reading assignments and there are Internet resources I may ask you to access and read. You are responsible for the material I assign for reading, even if that material is not discussed in class.
2. Sample Websites may include: Park Geology Tour: <http://www2.nature.nps.gov/geology/tour/index.cfm>
3. Park Geology Photos: <http://www2.nature.nps.gov/grd/edu/images.htm> U.S. Geological Survey: <http://www.usgs.gov> USGS Volcanoes: <http://volcanoes.usgs.gov> USGS Earthquakes: <http://earthquakes.usgs.gov>

### **SAMPLE ASSIGNMENTS AND/OR EXAMS**

1. **Three Exams and a Final:** Each exam will cover the materials presented in class and assigned readings. Exams will be a combination of multiple choice, short answer and description of processes.
2. **Quizzes**
3. **Written Assignment:** The written assignment which is due at the end of the class at the end of week 10 requires you to use the scientific theory to compare and contrast two National Parks explaining issues related to their geologic formation, weathering or post formation changes, and discuss why the two parks were selected for inclusion as a National Park – including not only the geology, but historical, cultural or societal issues. (Additional information will be given in class and posted on Blackboard).

### **SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ASSIGNMENTS, EXAMS/PROJECTS**

This is primarily a lecture class, but there will be demonstrations and experimentation to allow students to understand the principles of Geology. Although the class is relatively structured, you are strongly encouraged to ask questions for clarification at any time during class

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|----------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction/Overview<br>Reading: xi<br>Geochronology and Geologic Time Scale<br>Reading: p.1-6                       |
| <b>Week 2:</b> | Weathering and Rock Cycle<br>Reading: p. 13-15<br>Intro to Grand Canyon National Park<br>Reading: Ch 1                |
| <b>Week 3:</b> | Grand Canyon/Canyonlands National Park<br>Reading: Ch 1, 5<br>Zion, Bryce, Capitol Reef, Arches<br>Reading: Ch 2-4, 6 |
| <b>Week 4:</b> | Review for Exam and Catch up<br>Exam 1                                                                                |

- Week 5:** Mesa Verde, Petrified Forest  
 Reading: Ch 7, 8  
 Assignment: Great Sand Dunes, Badlands, Cuyahoga Valley  
 Reading: Ch 12,9,13  
 Assignment: Compare and Contrast two National Parks and discuss formation of sequences, weathering processes and why selected as a National Park (Due end of week 10)
- Week 6:** Caves and Reefs  
 Reading: p. 188  
 Mammoth Cave, Wind Cave, Carlsbad Caverns  
 Reading: Ch 14-16  
 Guadalupe Mtns, Virgin Isl, Dry Tortugas  
 Reading: Ch 17, 18, 21
- Week 7:** The Role of Groundwater  
 Reading: p. 189  
 Everglades, Biscayne, Congaree NP  
 Reading: Ch 19, 20, Handout
- Week 8:** Review and catch up  
 Exam 2
- Week 9:** Volcanoes  
 Reading: p. 505-510  
 Hawaii Volcanoes, Haleakala, Samoa  
 Reading: Ch 40-42  
 Yellowstone, Mt. Rainier, Crater Lake  
 Reading: Ch 43, 35, 36
- Week 10:** Major Mountain Belts  
 Reading: p. 643-646  
 Grand Teton, Great Basin,  
 Reading: Ch 44,45  
 Great Smokey Mtn., Shenandoah,  
 Reading: Ch 54,55
- Week 11:** Review and Catch up  
 Exam 3
- Week 12:** Glaciation  
 Reading: p. 289-294  
 Voyagers, Acadia

Reading: Ch 22, 24

**Week 13:** Rocky Mountain, Yosemite  
Reading: Ch 25, 28

**Week 14:** Glacier Bay, Denali, Kenai Fjords  
Reading: Ch 31-34

**Final Exam according to University exam schedule**