

## ***Syllabus for Geol 394: Mojave-Mecca Geology Field Trip Spring 2010***

**Credits:** 3.0; Section 01: CRN 1319; Section 02L CRN 1419

**Section 01 meets:** MW, 8:00-8:50 a.m., 205 Science 1 and Feb 20-28, 2010 in the field.

**Section 02 meets:** M, 5:00-5:50 p.m.; Th, 8:00-8:50 a.m., 205 Science 1 and Feb 20-28, 2010 in the field.

**Prerequisite:** an introductory Geology course and Geol 220 or Geol 201

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Personal web site: <http://employees.oneonta.edu/hasbarle/index.html>

**Required Textbook:** Rite in the Rain Geology field note book. You can find them online at <http://www.amazon.com/gp/product/B0011DGJSC>, ISBN 978-1-932149-35-7.

**Optional Textbook:** If you anticipate field work in your future, I recommend purchasing a copy of *Geology in the Field*, by Robert Compton (John Wiley and Sons, 1985; ISBN: 0-471-82902-1). This text provides a wealth of standard approaches to geologic data description and collection.

**Course objectives.** Students gain experience with geologic materials in field settings. They will characterize sedimentary rocks and mappable stratigraphic units, measure rock orientation, identify faults and folds and measure fault displacement, recognize effusive and explosive volcanic rocks, and understand how arid region geomorphic features form. Students will be able, after finishing this course, to:

- describe in detail sedimentary rocks and structures
- develop a reference stratigraphic column
- measure strike and dip of sedimentary layers with a compass
- plot locations of field measurements on a topographic map
- locate contacts between mappable units, and plot the contact correctly on a topographic map
- make accurate and complete field notes
- construct a geologic map from field data
- recognize unconformities
- measure geologic structures

### ***Course Narrative***

This course examines tectonic, volcanic, and geomorphic features along an active plate boundary in southern California. Students will map geologic structures around and including the San Andreas fault in the Mecca Hills, investigate groundwater disruption near 1000 Palms, take a tram ride to 8500 feet above local valley floors for a birds-eye view of a tectonic valley, visit a wind farm in a tectonic gap, measure offset along the 1992 Landers

earthquake zone, trek over the gigantic Blackhawk landslide shed off a tectonic thrust fault, peer into folded layers in Rainbow Basin for fossil camel footprints, stand on effusive and explosive volcanoes (now extinct), squeeze into slot canyons cut by drainage from Pleistocene lakes, gaze at cave formations, listen to singing sand dunes and probe desert geomorphology.

The trip runs for 9 days including travel, February 20-28, 2010 over the first spring break. Students will fly to Las Vegas, NV, and then take vans to field locations. We will stay at places ranging from undeveloped campgrounds to university research stations with dorm rooms and a kitchen.

### ***Course Justification***

There is a persistent need for trained geoscientists with experience in geologic field mapping.

This course will bring students in Earth Sciences, Environmental Sciences, Water Resources, and the Energy Minor to an active plate tectonic boundary in southern California. The Mojave Desert and Salton trough provide extraordinary teaching opportunities for students, exposing numerous faults and folds, a spectrum of rocks including sedimentary units, both effusive and explosive volcanic rocks, intrusive igneous and metamorphic rocks. In addition, desert springs associated with groundwater flow, topography, and faults provide superb examples of hydrology and geology interactions. Power plants which take advantage of the tectonic setting and atmospheric flow to generate power from wind and sun will be visited as examples of working alternative energy fuel sources. Finally, desert landscapes in the area exhibit prime examples of arid region landscape processes and geomorphology, including huge landslides, dunes, playas, fans, exfoliation of granite, pediments, desert pavement, paleolakes, and mountain erosion.

After returning from the trip, students will select a location/topic for greater examination, and present their investigation to the class. Topics could include: style of faulting and folding around a strike-slip fault; Pleistocene lakes in the Mojave; Mio-Pliocene fauna in the Mojave; water use in Palm Springs; hot spring characteristics in the Coachella Valley; wind power in southern California; interpreting the Blackhawk landslide; desert geomorphology (pediments, dunes, desert pavements, alluvial fans, etc); explosive volcanism in the Mojave; interpretation of the Orocopia schist, or some other subject which captures your imagination about the field trip.

### ***Grades***

Students will be evaluated based on **participation (10%)** on the field trip, **field notes (20%)**, **field maps, stratigraphic sections and cross sections (30%)**, and a post-trip **presentation (40%)**. All efforts will be assessed with a weighted rubric, where separate aspects of the exercise will receive a mark ranging from excellent to no credit. Each aspect will have a weight (content and analysis is more important than spelling, for instance). Aspects of an exercise might include grammar, scientific writing style, content, analytical treatment, overview of the problem, summary of the project, recommendation for action, and the like. Rubrics for field notes, stratigraphic and cross sections, and the presentation will be handed out early in the course. The rubric score will be re-scaled to the University curve, and final grade assignments will be guided by the standard University curve given below.

Percent	Grade	Percent	Grade	Percent	Grade	Percent	Grade
93-100	A	87-89.9	B+	77-79.9	C+	67-69.9	D+
90-92.9	A-	83-86.9	B	73-76.9	C	63-66.9	D
< 60	F	80-82.9	B-	70-72.9	C-	60-62.9	D-

**Lecture and Lab Schedule** (this schedule is subject to minors changes as needed).

Date	Day	Topic/Reading
Jan 20	W/Th	Class does not meet
Jan 25	M	Meet to discuss course; handouts
Jan 27	W/Th	Rock descriptions
Feb 1	M	Rock descriptions
Feb 3	W/Th	Measuring strike and dip/Mapping
Feb 8	M	Stratigraphic columns/Cross Sections
Feb 10	W/Th	California Geology
Feb 15	M	
Feb 17	W/Th	
<b>Feb 20</b>	<b>Sat</b>	<b>Fly to Las Vegas from Albany, NY; drive to Joshua Tree NP</b>
<b>Feb 21</b>	<b>Sun</b>	<b>Joshua Tree/1000 Palms/Mt. San Jacinto/Desert Hot Springs</b>
<b>Feb 22</b>	<b>M</b>	<b>Mecca Hills Wilderness</b>
<b>Feb 23</b>	<b>T</b>	<b>Mecca Hills Wilderness</b>
<b>Feb 24</b>	<b>W</b>	<b>Mecca Hills Wilderness</b>
<b>Feb 25</b>	<b>TH</b>	<b>Rainbow Basin: folds and fossils</b>
<b>Feb 26</b>	<b>F</b>	<b>Mojave National Preserve: Afton Cyn, Soda Lake, Cima Volcs</b>
<b>Feb 27</b>	<b>SAT</b>	<b>Mojave National Preserve: Hole in the Wall, Kelso Dunes</b>
<b>Feb 28</b>	<b>SUN</b>	<b>Trilobites; Drive to Las Vegas; Fly to NY</b>
Mar 1	M	Rest!
Mar 3	W/Th	Rest!
Mar 8	M	Students select topics for presentation
Mar 10	W/Th	Review of topics with instructor
Mar 15	M	Work on presentation
Mar 17	W/Th	Work on presentation
Mar 22	M	Work on presentation
Mar 24	W/Th	Work on presentation
Mar 29	M	Work on presentation
Mar 31	W/Th	Work on presentation
<b>Apr 5/7</b>	<b>M/W</b>	<b>SPRING BREAK!! NO CLASSES</b>
Apr 12	M	Work on presentation
Apr 14	W/Th	Work on presentation
Apr 19	M	Work on presentation
Apr 21	W/Th	Student Presentations
Apr 26	M	Student Presentations
Apr 28	W/Th	Student Presentations
May 3	M	Student Presentations
May 5	W/Th	Student Presentations

May 10	M	Student Presentations
May 12	W	Student Presentations
May 19	T/W	8:00-10:30 a.m. Maps, Notes, Sections Due; Course Evaluations

***Emergency Evacuation/Shelter-in-Place Procedures*** In the event of an emergency evacuation (i.e. fire or other emergency), classes meeting in Science I are directed to reassemble at Chase Gymnasium so that all persons can be accounted for. Complete details of the College’s emergency evacuation, shelter-in-place, and other emergency procedures can be found at <http://www.oneonta.edu/security> .

## ***Course Guidelines and Expectations for Students***

The following list provides a baseline of what is expected from students in this course (quoted section from the list of *Student Responsibilities* approved by SUNY Oneonta).

### ***“In class responsibilities***

*Students will:*

- Attend all classes and arrive punctually.
- If unavoidably late for a class, enter quietly and unobtrusively, and behave in other required ways to minimize distraction.
- Remain alert and attentive during lectures, discussions, and other class/lab activities.
- Avoid unnecessary conversation during lectures, discussions, and other class/lab activities.
- Contribute to class experiences by asking relevant questions, offering relevant examples or views, adequately answering questions posed by others, engaging in critical and independent thought, and challenging both the instructor and the curriculum materials assigned for the course.
- Demonstrate courtesy and respect in dealing with instructors and classmates.
- Recognize and seek to understand diverse points-of-view.”

### ***In the field responsibilities***

*Students will:*

- Assemble all materials they need to conduct field investigations and bring these items with them (this list will be supplied at the start of the semester)
- Participate in group camping activities, such as setting up and taking down tents, preparing food and cleaning up after meals
- Be respectful of fellow students on the trip and of other campers in the campground
- Maintain quiet time from 10 pm to 6 am in the campground (or according to the local campground guidelines)

## College Calendar, Spring 2010

January 17-19	Sunday-Tuesday	New student arrival & orientation
January 20	Wednesday	Classes begin
February 19	Friday	College closes after last class
March 1	Monday	Classes resume
April 2	Friday	College closes after last class
April 12	Monday	Classes resume
May 12	Wednesday	Study Day
May 13-19	Thursday-Wednesday	Finals
May 22	Saturday	Commencement

### Final Exam Week Class Schedule, May 13–19, 2010

During the last week of the semester, day classes will meet for 2 ½ hour periods according to the schedule below.

These periods are to be used for instruction and/or examination.

Date and Time	Thursday May 13	Friday May 14	Monday May 17	Tuesday May 18	Wednesday May 19
8:00 am–10:30 am	10 Tu Th	10 MWF	9 MWF	8 Tu Th	8 MWF
11:00 am–1:30 pm	4 Tu Th	2 MWF	1 MWF	2 Tu Th	3 MWF
2:00 pm–4:30 pm	12 Tu Th		12 MWF		11 MWF