University of Nevada, Reno
Department of Geological Sciences & Engineering

GEOLOGY SUMMER FIELD CAMP, 2015

GEOL 451, Section 720        Summer Field Geology        Credits: 6

**Instructor:** Sean P. Long, Ph.D.  (splong@unr.edu)

**Dates:** May 20 to June 27, 2015

**Times:** 8:00am - 5:00pm, daily

**Website:**  http://www.unr.edu/geology/summer-field-camp

**Locations:** Multiple localities in eastern and western Nevada

**Description:** The Department of Geological Sciences and Engineering at the University of Nevada, Reno, offers GEOL 451 as a comprehensive, six-credit, six-week summer geology field camp class. Through a series of field-based exercises, students will integrate previous coursework in order to gain the ability to understand complex geologic field relations in three dimensions. The focus of the course is to develop advanced field skills, including lithologic, stratigraphic and structural descriptions. They will analyze, measure and characterize geologic materials, and synthesize this data to produce descriptive and interpretive written reports, generate geologic maps, and illustrate the geometries of deformed rocks using cross-sections. This course is enhanced by the incredible geologic setting of these exercises, which includes several world-class geologic sites in eastern Nevada, in the heart of the Basin-and-Range province, and in western Nevada, where the Basin-and-Range meets the Sierra Nevada. For the first four weeks, we will utilize our field station in Ruth, Nevada. The final two weeks will take place near Pyramid Lake in western Nevada. Especially memorable areas that we will visit include Great Basin National Park and Lake Tahoe.

**Catalog Description:** Geologic techniques in the field: mapping igneous, sedimentary and metamorphic rocks; study of mineralization, geomorphology, structural and stratigraphic techniques. Course fee covers room, board, and transportation.

**Prerequisites:** GEOL 212, GEOL 332, completion of CO 1-8, junior or senior standing.

**Course Objectives:**

**Core Objective 13 (Integration and Synthesis):**
Students will be able to integrate and synthesize Core knowledge, enabling them to analyze open-ended problems or complex issues.

**Core Objective 14 (Application):**
Students will be able to demonstrate their knowledge and skills developed in previous Core and major classes by completing a project or structured experience of practical significance.

**General Course Objective:**
Students will analyze, measure and characterize geologic materials and features (including mineralogic, petrologic, stratigraphic and structural components) in a field setting.
Student Learning Outcomes (SLO):  
Core Objective 13 (Integration and Synthesis):  
SLO1. Students will be able to integrate Effective Composition & Communications skills (CO1) and Critical Analysis & Use of Information (CO3) to interpret and describe geologic features and the geologic processes that produced them.  
SLO2. Students will be able to synthesize information and techniques from previous coursework across disciplines to complete geologic field exercises and accompanying reports.  
Core Objective 14 (Application):  
SLO3: Students will be able to describe the results of geological field investigations in professional report format appropriate to the geosciences.  
General:  
SLO4: Students will be able to articulate and follow ethical principles in a scientific context, including professional standards of field research, communication of results without plagiarism, and appropriate crediting of collaborators. (CO12)

Exercises:  Our field camp exposes students to a wide variety of exercises, which are all founded in geologic mapping. Many of the exercises involve problems of practical significance (for example, applications to real-world problems such as mineral exploration). All field exercises are followed by writing up an accompanying report, in which each student produces new and unique products, including geologic maps, detailed lithologic descriptions, stratigraphic columns, geologic cross-sections, and structural interpretations. Exercises and their percentage contribution to the final course grade include:

1. Introductory exercises near Ruth, Nevada (introductory; no percentage value)  
We will start off with a 1-day First Aid course, which will be led by an emergency response team based out of Ely. This will be followed by a 1-day long series of exercises in the Ruth field station that are designed as an introduction, in order to brush-up on your rock description, map location, and Brunton compass skills. By the end of this exercise, we hope to have everyone on the same page in terms of basic mapping skills.

2. Pancake Summit: 24% of course grade  
For our first major mapping exercise, we will spend 5 days working in the region east of Eureka, NV. We will focus on mapping and interpreting the deformation geometry of Mississippian carbonate and clastic rocks of the Antler foreland basin, as well as Tertiary volcanic rocks.

3. Gold Point: 16% of course grade  
This 3-day project, located near Currant, NV, is an economic geology exercise that involves mapping in hydrothermally-altered rocks, understanding the spatial relationships of alteration to structures and stratigraphic contacts, and interpretation of geochemical data. The end goal of this project is to evaluate the map area for its potential for Carlin-type gold mineralization, which Nevada is famous for.

4. Antelope Mountain: 24% of course grade  
This is a 5-day mapping project in the region between Eureka and Ely. Here, Tertiary volcanic rocks unconformably overlie Mississippian and Pennsylvanian sedimentary rocks that have an older history of folding. The complex field relations in this exercise will develop your structural
analysis skills, and your ability to map volcanic rocks that can change character over short distances.

5. Incandescent Canyon: 20% of course grade
This 4-day mapping project, located just west of Pyramid Lake in western Nevada, is within a series of remarkably well-exposed Tertiary tuffs, which exhibit significant changes in thickness and outcrop character within the map area. This exercise is excellent for developing skills in the description of volcanic rocks, and for learning to use lithologic characteristics such as phenocryst assemblage to identify rock units. It is also a challenging exercise, because detailed analysis of field relationships is necessary to differentiate the effects of paleogeography versus faulting.

6. Quaternary Lake Lahontan sediments: 16% of course grade
This 3-day Quaternary surficial geology project will be conducted south of Pyramid Lake in western Nevada. This exercise will consist of several components, including an introduction to Basin-and-Range landforms, lacustrine and alluvial processes, and the Late Quaternary history and stratigraphy of pluvial Lake Lahontan. A two-day field mapping exercise of Quaternary deposits and faults will be the graded part of this segment.

Field trips: In addition to exercises, there will be several optional, day-long field excursions, to scenic areas including Great Basin National Park and Lake Tahoe.

Grading Scale: 90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; Below 60% = F

Mandatory readings and map assignments: The instructor will provide all required hand-outs in the field.

Statement on Academic Dishonesty: Cheating, plagiarism or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment. For more details, see the University of Nevada, Reno General Catalog.

Statement of Disability Services: Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the Disability Resource Center (Thompson Building, Suite 101) as soon as possible to arrange for appropriate accommodations.

Statement on Audio and Video Recording: Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.