SYLLABUS

 University of Wyoming

GEOLOGY 4717

May-June 2017

**About this course –**

Geology field camp is your opportunity to develop skills of observation and interpretations while learning the technical aspects of field mapping, rock description and interpretation, and structural analysis. Preparation of maps, stratigraphic columns, geologic or geophysical cross-sections, graphical plots of data, and reports is a critical part of the course.

Geologic mapping requires synthesis of knowledge and skills from every aspect of geology. It is both intellectually and physically challenging, but steady progress and the occasional epiphany are tremendously rewarding. It is also occasionally frustrating as well. Exercise patience as you develop and refine your geologic intuition and field skills. This class provides ample time for instructor-student contact; ask questions and ask for comments on your map and notes in the field, or any other help you might need. Take your time, be careful in your note taking and mapping, and think about the geology you are mapping. Plan your traverses to answer questions and solve problems as they develop in the field. We will consult have consultations with the instructor and/or TA at the beginning of each field day to review progress, and go over a plan for the day.

Students are responsible for all the skills and knowledge they have acquired in previous courses, and are required to apply it in geologic investigations. This year we will conduct field work in three main areas: (1) the White-Inyo Mountain and Long Valley caldera regions of eastern CA, (2) the Summer Coon Mountains, Colorado and (3) in and around Laramie, WY.

**Learning Outcomes -**

* Identify and classify basic geologic materials, including minerals, rocks, fossils, structures, and landforms, and know their basic material/mechanical characteristics and/or biological properties.
* Create basic types of geologic maps using standard symbols, and standard field measurement techniques and equipment.
* Visualize and comprehend geological materials or structures in 3-D based on 2-D data sets. Perform basic types of geologic analysis that includes taking field notes (and sketches), making lithostratigraphic and biostratigraphic correlations, map and cross-section construction.
* Communicate the major geologic events in an area based on notes, map and stratigraphic data you collect in the field.

Upon completion of the class, your will have the skills necessary to perform many field tasks required in geologic professions and will be able to conduct field studies at a graduate level.

**About the instructors –**

Director: Dr. Barbara John (structural geology and petrology)

Instructor in Surface Processes and Geomorphology: Dr. Neil Humphrey

Instructor in Petrology: Dr. Ken Sims

Instructor in Geophysics: Dr. Brad Carr

Teaching Assistants: Lisa Kant, Sean Scott, Amber Zandanel, Drew McPeak, Nate Maier, Maneh Kotikian

Cooks: Tim Etzkorn, Peyton Lunzer

**Course expectations –**

For the duration of this course, you are expected to participate in all projects and give each assignment your utmost effort. Since the course requirements include mineralogy, strat/sed, and structural geology, you will be expected to know the content of those courses. However, this class is not a test. You will be taught how to create a geologic map and cross section from field date, measure stream flow and interpret the water cycle in a basin, map in the field, and how to use different geologic, hydrologic and geophysical field equipment. If you don't understand a concept or procedure, or have forgotten previous course contest, we encourage you to ask questions as early as you can.

**Grading-**

Due to the nature of the course, the grading system has to remain flexible. Weather can (and likely will) force us to modify the field projects as we go. If you have any questions about grading as the course proceeds, please ask.

Your grade will be based on the following:

1. Big Pine introduction to mapping (3 days), Westgard/Poleta stratigraphy and detailed structural mapping (5 days), 4 day-long projects (water cycle, magmatism, tectonics and climate, etc) based at SNARL, 1 day project construction of the middle crustal Lamoille Canyon, NV
2. geomorphology project - Laramie and adjacent areas (5 days)
3. igneous mapping project Summer Coon Mountains (4 days)
4. near-surface geophysics (6 days)

**Project assessment**

All projects will be graded on their presentation, accuracy, content, with an additional grade assigned for your participation (field and camp -10%).

**Map:**

* Data recording and density: sufficient and appropriate for field conditions and structural complexity in the area being investigated
* Contacts and units are accurate and defensible – free of major unexplained thickness changes and consistent with all measurements and observations. Rule of V’s observed. Location and detail/subtlety evaluated.  Structure as mapped and interpreted is shown by standard geologic symbols and supported by data and observations. Map is internally consistent.
* Complete legend/map explanation for all symbols and units. North arrow and scale included.

**Cross Section:**

* Consistent with all major structural features present on your map and mechanically correct in all aspects.

**Stereonet plots:**

* Plot fold measurements as poles to determine hinge orientation (trend and plunge), axial surface (strike and dip).

**Reports:**

* Organized, complete and concise; speaks specifically to the field area and map data. Reflects knowledgeable application of structure and stratigraphic concepts and terminology.

**Field notes:**

* Mechanics: includes date & field location at top of each page, legibility, completeness (coherent descriptions), and consistency and interconnectedness.
* Drawings and Sketches: scale and orientation, usefulness and relevance, active model testing by visual representation.
* Evidence of Scientific Thought: frequent making and testing of predictions evident, uncertainty is acknowledged and dealt with, and general evidence of active and responsive thought.

**Stratigraphic columns:**

* Graphic section – provide title at top, show names, ages and thicknesses of units.
* Correct use of lithologic symbols – distinguish between main units.
* Thicknesses – is total thickness of section reasonable?
* Lithologic descriptions – emphasis on key identifying characteristics of units; organization, consistency, detail, accuracy

**Project assessment**

All projects will be graded on their presentation, accuracy, and content.

**Camp/course behavior:**

For the duration of GEOL 4717, you will be living and working closely with both your fellow students and instructors. You must treat all members of field camp with the respect and consideration. Recreation is encouraged, but must be conducted safely at all times, and with thoughtfulness for others. If you plan to hike back to camp or go for a run after mapping, you are required to inform the instructor or a TA beforehand, indicating where you are going and when you will return. This can be a very enjoyable time for all if everyone follows these simple guidelines -

Specific requirements–

* no alcohol (beer, wine or hard liquor), or illegal substances (really)
* no use of or carrying firearms
* 10 PM-6 AM noise curfew in camp
* no seconds on meals until everyone has been served
* dish washing rotation
* keep a clean camp and clean vehicles (no living out of the back of the vehicle)
* no harming or harassing wildlife or livestock
* campfires must be doused to a slurry before going to sleep EVERY night

**Cell phones:**

Many of our campsites are outside cell service. There will be stretches of time as long as 5 days when you will NOT be able to make cell phone calls. In emergencies we can be reached by the BLM/Forest Service rangers. Cell phones may be charged from vehicles while the vehicles are being driven, but not when in camp. **There will be periods when your cell phone is dead and cannot be charged.** As a precaution, setting your phone to airplane mode will conserve the battery.

**Field behavior:**

While in the field, you are expected to work in a professional manner. We will generally start work at 8AM, and end by 5 PM. While you are encouraged to work on your maps and cross-sections/stereonets in the evenings, we cannot allow you to continue mapping after dinner for safety reasons.

The guidelines to follow include –

* work with your assigned partner, and your assigned partner only
* work diligently, and be mindful of safety
* treat public and private property with respect
* do not litter or smoke in the field (NO orange or banana peels, cigarette butts, or toitet paper)
* work independently when required
* no earbuds or headphones in the field…leave them in camp or the vehicles

**Field preparation:**

You are REQUIRED to carry at least 2 liters of water in the field each day. Every field day bring water, lunch, and field gear inside the vehicle with you. Do not expect to stop at a store (there are none). When we leave Laramie May 16, please have your own lunch and water.

**Safety:**

The first priority for field camp is everyone’s safety. DO NOT engage in any activities that endanger yourself or others.

* Rock climbing, bouldering and boulder rolling are not permitted, ever.
* Alcohol (beer, wine or hard liquor) will not be tolerated while away from Laramie, in vehicles or camp.
* Never climb any cliff, mountain or outcrop that makes you feel uncomfortable
* If you feel the driver if your vehicle is driving dangerously, tell the field camp director immediately.
* If you are in a situation that puts your safety at risk or you perceive you may out your safety at risk, remove yourself from that situation immediately and inform the field camp director.