

Geology 455/598 Advanced Field Geology Spring 2012

Instructor: Prof. Stephen J. Reynolds: PSF 552; sreynolds@asu.edu; 480-510-4022 (cell)

Teaching Assistant: None, but Brad Vance has graciously volunteered to help. Also, each of you will work with several other students in the class to help get the department field gear ready for one trip.

Field-Trip Dates: The class consists of four weekend field excursions, ranging from 1.5 days to 2.5 days. The actual dates and tentative sites are as follows:

Feb. 4-5: Plutonic rocks and contacts – San Tan or White Tank Mountains on Saturday and Shaw Butte on Sunday, finishing about 1 PM; great plutonic geology, with intrusive relations to be deciphered; done as two single-day trips, leaving each day at 7:30 AM from the loading dock

Feb. 18-19: Mid-Tertiary sedimentary and volcanic rocks and structures – Wickenburg Mountains, spectacular sequences exposed in drainages cut across extension-related units and structures.

March 2-4 (leaving Friday afternoon, the 2nd): Structural wonderland – Overturned and structurally attenuated Paleozoic and Mesozoic rocks in the geologically famous Big Maria Mountains, CA.

March 31- April 1: Metamorphic rocks and structures – The site of this trip will be decided once we can tell if the weather will be too hot for the low desert. If it is cool, we will go into the western Harcuvar Mountains, for high-grade gneisses, migmatites, and shear zones, a place where I have never taken students before. If it is hot, we will explore metamorphic rocks in higher elevations.

Logistics and Equipment: For most trips, we will leave from the loading dock, Physical Sciences F Wing, on Saturday morning, camp out, and return on Sunday evening. The first trip will involve two day trips, partly because the daylight hours are short this early in the year and partly to get us back in time for the Super Bowl on Sunday afternoon. If we expect bad weather, a weekend trip may be changed to individual day trips to nearby exceptional geologic sites. We will travel in University-rented vans/SUVs.

If weather permits, each weekend trip will involve camping on Saturday night, so you will need to bring a sleeping bag, pad, flashlight, and all the personal items you typically take camping. We will help organize water, camp stoves, cooking kits, silverware, lanterns, etc. Each person will be responsible for your own meals, unless you arrange otherwise among yourselves. By state law, no alcohol is allowed in ASU vehicles.

Essential field gear includes hiking boots, backpack, at least two one-liter water bottles (more if it is going to be hot some weekend), hat, sunglasses, sunscreen, rock hammer, hand lens, map clipboard, pencil, pens, a few colored pencils, and something to take field notes in (notebook or sheets of loose-leaf paper carried in your map board). If you need to check out a departmental compass, see me. Bring other items you might need (small first-aid kit, etc.).

Goals of the Class: Our goals for the class are to introduce you to diverse types of geology that are typically not covered in an undergraduate field camp or structure class. Students taking the class represent very different backgrounds and levels of experience; some students have had field camp and others will be taking Field Geology I concurrently. The main requirement is that you know how to locate yourself on a topographic map, understand what a geologic map shows, and be able to use a compass. The class is not just a mapping class – the main goals are to teach you how to observe and think in the field, how to record your observations and thoughts in your notebook, and how to concisely summarize, in writing, your main observations and conclusions. We will together learn how to describe, analyze, and portray various types of geology, emphasizing rock types, structural analysis, and contact relations.

Your Grade: Since this is a field class, we place a heavy emphasis on observations and interpretations that you make *in the field*. The breakdown for your grade is as follows:

- 70% — your field notebook (plus or minus a field map, depending on the week), which will be turned in when the ASU vans reach the loading dock at the end of the weekend
- 30% — one- to two-page reports about some aspect of your field studies, to be turned in the second Wednesday after we have finished a field area. For each report, you will turn in (1) a rough draft with review comments from two of your classmates or other geologists (reviews must be signed); (2) a final draft incorporating valid suggestions from the reviews; and (3) at least one figure (not included in the page limit), such as a nice sketch, drawing, cross section, stereonet, evolutionary diagram, etc. These do not have to be drafted, but need to be neat and readable. A single annotated photograph is not sufficient. That's it! Let's go observe, analyze, and figure out some cool Southwestern geology!