

SRSU GEOL 4601 – Field Geology

SUMMER 2024

Dates: May 30 – July 3

Instructors: Dr. Thomas Shiller

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Location: The SRSU 2024 Field Geology course will start and end at the Alpine campus in the Davis Mountains of West Texas. There will be one morning of classroom instruction in Alpine, followed by an afternoon exercise on Hancock Hill. The group departs Alpine for 11 days in Big Bend National Park to study sedimentary rocks, Laramide-age folds and faults, Cenozoic volcanic and plutonic rocks, and Rio Grande Rift structures. The group will then spend 3 days in Bend Ranch State Park where students will have the opportunity to map one of the most interesting geologic features in the region – the Solitario. The primary focus of this class is geologic mapping and construction of geologic cross sections.

The major exercises will cover the following topics:

- Geologic mapping of Cretaceous-Neogene rocks and sediment in Big Bend National Park, TX;
- Mapping and measuring structures related to the Laramide Orogeny and Basin and Range tectonics in Big Bend National Park;
- Mapping of Paleozoic, Mesozoic, and Cenozoic rocks and structures of the Solitario in Big Bend Ranch State Park.
- Mapping of Precambrian and Paleozoic rocks near Van Horn, Texas.

General Objectives: Each student will develop:

1. Knowledge of field techniques used in the geological sciences
2. Knowledge of proper conduct in the field
3. Practical skills in wilderness first aid and survival
4. Knowledge of reporting observations made in the field
5. Skills in processing data collected in the field

Student Learning Objectives: Each student will demonstrate the ability to:

1. Identify rocks and geologic features in the field
2. Measure geologic structures using a Brunton compass
3. Construct detailed geologic maps and cross sections

Materials:

- For the camping portion of the trip, you are responsible for your own personal camping gear: tent with useful rain fly (it WILL rain,) strong tent stakes, sleeping pad, sleeping bag, camp chair, flashlight(s), etc., plus your own drink cup and coffee mug (all other kitchen gear is provided.) Dry bags will be provided to students for the river trip. We will be car-camping for the duration of the camping portion, so you can even bring a pillow, but try to sensibly minimize your personal-gear footprint as there will be 14 of us plus our gear. (However, you are welcome to bring the extra comforts you deem important.) In the past, students have brought hammocks to sleep in, for the few sites where there are strong, mature trees. (This is in addition to a tent, because not

everywhere are there ample trees.) Shower facilities will be available only at some of our camp sites. There will be a cook/ camp steward traveling with us who will set up a camp kitchen and provide us with three meals a day (sack lunch into the field) plus water and Gatorade. Students will rotate through kitchen-help duties. Work tables will be set up at each camp for completing field assignments.

- You must also bring your own personal gear for comfort and safety: sturdy, broken-in hiking boots, plenty of good socks; outdoor clothing for high temperatures (>100°F) and all-day sun, for rain both in the field and at camp; waterproof shoes both for fluvial geomorphology work (wading in a shallow stream) and canoeing as well as a suit for optional recreational swimming. Sunscreen, a large-brimmed hat, and refillable water bottles are also required. Temperatures in Big Bend will likely exceed 100°F during the day, so you **MUST** carry at least a gallon of water into the field with you (there are no refill sites in our remote field areas). Camelbak or similar bladder-type backpacks work well, as do Nalgene or Klean Kanteen bottles. In addition to three meals per day, snacks will be provided daily but we will also intermittently stop for gas as we move between campsites, so you should bring spending money if you'll want extra treats or soda.
- You also need to bring gear to operate as a field geologist: a map board, colored pencils, quality mapping pencil(s), a scale and protractor, grain size card, a comfortable and sizeable back pack. A field belt, and a field pouch to hang on your belt next to your hammer holster is **VERY** handy as well. (Plateau Designs of Flagstaff, AZ has been providing good cheap field pouches to field camp students for a couple of decades.) What will be provided to you: a collection of literature pertinent to the geology on our traverse; stereonet paper; and base maps. Bruntons and hand lenses will be checked out to you at the beginning of the course, to be returned in exchange for your letter grade at the end of field camp.
- Campground fees, food and entrance-fee costs when we are on the road are provided. Students are responsible for their own board and lodging during the 2 nights in Alpine at the start of the session before we depart and two nights in Alpine at the end of the session when we return. SRSU dorm rooms will be available for rent to visiting students for the Alpine nights, and Alpine has a few nice campgrounds as well.

Grading:

- 5 geologic maps: 100 points each (total: 500 points)
- 5 cross-sections: 50 points each (total: 250 points)
- 5 reports: 50 points each (total: 250 points)
- Notes and participation (6 projects): 10 points each (total: 60 points)
- **TOTAL: 1060 points**

Letter Grading: Final course grade will be based on a percentage of the total points as follows:
90.00-100% = A; 80.00-89.90% = B; 70.00-79.90% = C; 60.00-69.90% = D; Less than 60.00% = F

Schedule:

This calendar is subject to change with prior notice, at the instructor's discretion.

30-May	Thur	Alpine
31-May	Fri	Alpine, lecture, Hill exercise
1-Jun	Sat	Big Bend Loop/Drive to Chisos
2-Jun	Sun	South Rim
3-Jun	Mon	Map 1
4-Jun	Tues	Map 2
5-Jun	Wed	Day off, laundry, showers, Map 1 due
6-Jun	Thur	Map 2,
7-Jun	Fri	Map 2
8-Jun	Sat	Drive to Terlingua, day off, Map 2 due
9-Jun	Sun	Map 3
10-Jun	Mon	Map 3
11-Jun	Tues	Map 3
12-Jun	Wed	Drive to BBRSP, day off, Map 3 due
13-Jun	Thur	Map 4
14-Jun	Fri	Map 4
15-Jun	Sat	Drive to Alpine, day off
16-Jun	Sun	Drive to Van Horn, Map 5, Map 4 due
17-Jun	Mon	Map 5
18-Jun	Tues	Map 5, leave for New Mexico (Dr. Kelsch takes over)

Students Needing Special Accommodations:

Any student who because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make necessary arrangements. If an accommodation is needed, students must present their accommodation letter, obtained from Accessibility Services, as soon as possible. Please note that instructors are not permitted to provide classroom accommodations to a student until the appropriate verification has been received. Accessibility Services is in Ferguson Hall room 112. You can make an appointment by calling Mary Schwartze Grisham at 432 837-8203.

Geology BS marketable skills:

1. Student will be able to conduct field work.
2. Student will be able to use field equipment.
3. Student will be able to use lab equipment.
4. Student will be able to use library resources.
5. Student will be able to communicate in written and oral format.

Geology BS SLO's:

1. The student will be able to apply a diverse body of Geologic information in the area of Earth history.
2. The student will be able to apply a diverse body of Geologic information in the area of mineralogy and petrology.
3. The student will be able to apply a diverse body of Geologic information in the area of structural geology and tectonics.
4. The student will be able to apply a diverse body of Geologic information in the area of stratigraphy.
5. The student will be able to apply a diverse body of Geologic information in the area of field techniques.