**GEO 395 – Field Geology**

**Course Purpose and Objectives**

The course is five and a half weeks long, for six credit hours, and is taught on location in northern Wyoming and western South Dakota.

**COURSE DATES**: May 22-June 23, 2022.

**DEPARTURE**: 6:15 AM from Felmley Hall, followed by 6:30 at the Baymont.

**FACULTY**: Dr. David Malone (Sedimentary and Structural Geology), Dr. Jennifer Gifford (Structural Geology and Petrology), Dr. Jed Day (Paleontology and Sedimentary Geology), Dr. Lisa Tranel (Geomorphology), and Paul Meister.

**COURSE OBJECTIVES:**

1. To learn basic field techniques, particularly: using the Brunton compass, measuring geologic sections, describing rocks, taking field notes, and making field sketches.
2. To learn the latest technologies that are used in the construction of geologic maps.
3. To learn the skill of geologic mapping, a process that involves total immersion in the science and in the project at hand, and the associated skills of location on topographic maps and air photos and interpretation of features on these.
4. To learn to interpret the structure and geologic history of an area based on your field observations and geologic map. Such ability is demonstrated mainly through the construction of geologic cross-sections from the geologic maps.
5. To learn the importance of accuracy in data acquisition and placement on a geologic map.
6. To integrate aspects of prior coursework into a comprehensive package in which the student becomes aware of the interdependence of all parts of the science of geology.
7. To develop an appreciation of the scale of geologic features and of the “reality” of geologic features, as compared to their depiction in print media.
8. To develop the skills and expertise needed to make the transition from student to professional geologist.
9. To develop senses of self-confidence and professional competence.

**ASSIGNMENTS AND GRADING:**

 A variety of assignments will be given and graded, including, but not limited to, mapping projects from 1 to 4 days duration, cross-section constructions, interpretations of field features, rock and section descriptions and measurements, and a field exam on local stratigraphy. Field notebooks and written assignments also will be critiqued and graded along the way. At the end of camp, the faculty will collective determine a grade component based on professionalism, work ethic, and attitude that will be worth at least 10% of the final course grade.

 All assignments will be due at a specified time, and it is assumed that students will respect the deadlines. Faculty from both universities grade assignments and written comments are made on most projects. Students are expected to learn from critique comments and to improve continuously throughout the course.

 Most assignments will have some points allotted to “style and grace”, i.e. neatness and presentation. Correct spelling of all words, particularly geologic terms, is expected.

 On most projects, students will work in pairs or small groups. The reasons for this are for safety in the field and for professional discussion of observations and interpretations. **However, it is fully expected that each student will acquire his/her own field data, take his/her own notes and produce his/her own map and cross-sections. It is not acceptable for partners to each do a part of the work and to then exchange information to complete the project. Failure to abide by the above policies may result in dismissal from this course.**

**RULES:**

Adherence to several rules is absolutely necessary. More are provided in your field guide.

1. There is to be absolutely NO association of alcohol or drugs with University vehicles or in the dorms at the Colleges at which we stay. Failure to abide by this rule will precipitate dismissal from the course.
2. No-smoking rules apply in university vehicles.
3. You are not to leave any garbage in the field (GIGO rules!) and not to carve your name, etc. on rocks or trees.
4. You are to leave gates as you find them, open or closed, and you are not to climb wire fences.
5. Do not walk across alfalfa or hay fields.
6. Vehicles leave for the field promptly at 8:00 AM. Be there and be ready or be left behind.
7. You are reminded of the ISU student code of conduct. Prior to your departure, you will be asked to sign an agreement as to how you will be expected to conduct yourselves while we are working an on the days off.

**WORKING CONDITIONS:**

 The working conditions in the field can be both physically and mentally taxing. You may walk ten miles in a single day, climb 2000 ft in elevation and spend all day above 2000 ft. Keep yourself in top working condition and keep a positive attitude. Wear a hat to protect yourself from the sun. Drink adequate water to prevent dehydration and eat balanced meals. You need electrolytes and carbohydrates. This is not a time to be dieting.

 A tentative schedule will be issued that provides for a six-day workweek. One day per week is scheduled off. However, because of unpredictable weather conditions, it is often necessary to shuffle the schedule. **No scheduled day off is guaranteed.** It is important to note that most evenings will be working too, as lectures and project work will occur during these times.

 Weather conditions over the six weeks are likely to vary between cold, wet and snowy with temperatures barely above freezing, to hot and dry, with temperatures in the lower 100’s. Particularly during the first half of the course the weather can be truly nasty. If at all possible we work rain or shine, so always be prepared with adequate clothing and rain gear. Prepare to dress in layers, as the conditions often vary widely within a single day.

 You will be working on steep slopes, some with loose rock. Always be cautious with your footing and be aware of people below you. If you loosen a rock on a slope, yell “ROCK!” loudly to warn those below.

 Some critters and plants can present dangers in the field. Rattlesnakes are common, particularly in the outer edges of the Black Hills. If you hear their warning, let them be and go around them. Warn others of the snake’s location. Do not try to kill them. Be careful stepping or reaching where you cannot see. Deer ticks may carry Lyme disease and wood ticks may carry Rocky Mountain spotted fever. You should make a “tick check” every night.

Be wary of cattle, some are friendly, some are not. They are curious creatures and like to follow you around.

 Poison ivy is extensive in some areas, especially prevalent on limestone and dolomite. Learn to recognize it. Ask faculty to point it out until you learn.

 Alcohol and smoking retard your ability to function efficiently in the field.

 We will work on private and public property. Respect it and leave no trace of your presence.

 After the rainy season, forest fires are a very real hazard. It is best not to smoke in the field. If you must, then sit down in one place to smoke. It is not acceptable to be walking around smoking. Cigarette butts are to be ground out, then field stripped before being released. That means you must use your fingers to strip the paper and physically disaggregate the tobacco (if it is too hot to do this, it is too hot to put down), then grind the remains into the ground.

**MISCELLANEOUS COMMENTS:**

 Cell coverage varies, and internet access is available in spotty conditions at each of the places that we stay.

 Sturdy field boots are required. Tennis/running shoes are not acceptable.

 You will be staying in dormitory rooms. Students from all schools will be paired, but not males and females together. Rooms are Spartan (beds, mattress, closet, desk, dresser, chair, wastebasket, four walls, ceiling, door and a window. There is Wifi in Sheridan and Spearfish, but not the two destinations in Wyoming. Bedding and pillows are not provided everywhere but Spearfish (still working on that). Bringing a small sleeping bag is recommended.

 If you maintain a positive attitude and an open mind, and if you try your best, you will most likely learn more in this course than in any other course you have ever taken and will enjoy doing so. Alumni say they will remember it fondly the rest of their lives. This course ties together most of the geology courses you have taken in preparation for being here and prepares you to enter the professional world.

 Laundry facilities are available at most of the places that we stay.

**Things to Bring**

**Geology Equipment**

pocket knife

hand lens, approx. 10X

geology hammer

at least two one-liter water bottles

calculator, with trig functions

day pack

protractor-ruler (6”)

pencils

drawing pens

colored pencils

erasers

**Personal Stuff**

Bedding (sleeping bag) & pillow

Clothes for about a week. Avoid cotton for the field clothes.

medications

towels

swimsuit

hat

field boots (Vibram soles are best) & socks

insect repellent and sunscreen

field clothes, including gloves

sunscreen

rain gear

cold-weather jacket or coat

toiletries