

GEOLOGIC FIELD METHODS

GEOL 1157

Summer Session, 2021

University of Pittsburgh-Johnstown

Instructors:

Christopher Coughenour, Ph.D.

coughenour@pitt.edu; Krebs 227B; x2945

Ryan Kerrigan, Ph.D.

kerrigan@pitt.edu; Krebs 227A; x2942

Dates: May 14 – June 26, 2021

Room: Krebs 220

Schedule: Fridays, 6 – 9 PM

Saturdays, 9 AM – 4 PM



<http://www.trailspace.com/gear/brunton/8099-pro-eclipse/>

Required equipment: Rite-in-the-Rain notebook (waterproof; min. dimensions 4.5”x7”)
Clear ruler and/or protractor
Pencils and pens that will not smudge on waterproof paper
Appropriate clothing and shoes (no open-toe) for outdoors work in variable conditions
Field pack or daypack
Food for lunch in the field and sufficient water (generally, ≥ 2 L to be safe)

Suggested equipment: Hat and other sun protection
Insect repellent (particularly, tick protection such as permethrine)
Rock hammer, hand lens, compass (these will also be provided)
Personal first aid kit

Course description:

This course is intended to provide instruction to upper-level students in the fundamental skills that are required for geologic work in the field. A central theme throughout the course will be the proper and thorough collection of data in the field and professional record-keeping of the process and data in a field notebook.

Field methods practiced will include: map and compass navigation, strike and dip collection, and field mapping of geologic units and topography. This will include description, measurement, and mapping of stratigraphic and structural features. We will also review some field methods used by environmental scientists in the collection of stream dimensions and water-related data.

We will meet on Friday evenings to discuss concepts and background appropriate for each exercise. Saturdays will be spent in the field practicing techniques.

Physical requirements:	This course will require sometimes strenuous hiking in variable weather conditions (rain, snow, heat, humidity, etc.). We will often be in the field for hours without access to amenities. It is expected that students will be able to endure these physical requirements, which often accompany employment as a field geologist. In the case of a documented medical issue, we will gladly provide accommodations to ensure a safe and productive experience (see “Disabilities” statement).
Students with disabilities:	If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Health and Counseling Services, G-10 Student Union, 814-269-7119 as early as possible in the term. The Office of Health and Counseling Services will verify your disability and determine reasonable accommodations for this course.
Safety:	Students should have a respect for the dangers of field work. Students must be mindful of their environment and not engage in risk-taking activity near steep slopes, quarry walls, roads, or other potential hazards. Use of rock hammers must be done with appropriate eye protection and only after others in the vicinity have had a chance to move or don protection. Failure to act responsibly in the field may result in dismissal from an exercise (with no opportunity for make-up) and, in some instances, the entire course. *Covid-19: We are also still contending with a pandemic and will follow Pitt and CDC guidelines in maintaining a safe learning environment. Everyone’s cooperation is needed and appreciated.
Academic integrity:	Field work is collaborative, but sketches, notes, interpretations and other work must represent individual effort. For all field projects, you will be working with at least one partner; each person is expected to contribute equally to collecting field data. Those who do not contribute sufficiently will have this reflected in their grade (regardless of quality of notes). Field observations must not be copied from your partner. Sharing measurements is necessary; however, simply copying sketches, observations, and interpretations from a partner is cheating and will be handled in accordance with university guidelines.

Grading:	
Notebook	30% (failure to have required notebook will result in grade deduction)
Exercises & homework	40% (must be turned in on/before the due date)
Quizzes	20% (there will be a quiz each week)
Professionalism	10% (Assessed on attendance, attitude, and collaboration with others)
Notes on grading:	Attendance in all class sessions is mandatory. Make-up work will not be offered, due to logistical constraints. Two absences will result in a full letter grade reduction unless there is a written, documented medical exemption. More than two absences will result in a) a course incomplete if there is a written, documented medical exemption for all absences, or

	b) failure in the course, if no medical documentation. There will be no exceptions to this attendance policy for any reason. Work or summer travel plans are not exemptions.
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Schedule (subject to change)

Day	Date	Topic(s)
F	May 14	Course summary, expectations, equipment distributed (compasses, text, etc.). Proper field note-keeping. Brunton-type compass review; magnetic declination, bearings, and azimuth. Practice in quad. Review of aquifer tests.
S	May 15	Mapping and well exercise on campus. Mapping the precise location of two wells and performing tests on the wells to determine aquifer parameters. Closing a traverse, triangulation, and strike-dip practice

F	May 21	Stream hydrology field methods overview (surveying and mid-section method). Introduction to leveling: use of the stadia rod for distance and elevation. Measure eye height. Use of the hand level with stadia rod. Practice in quad. Quiz on compass concepts Finished campus well map and calculations due
S	May 22	Stream hydrology in the field: stream survey in Little Paint Creek

F	May 28	Introduction to construction of stratigraphic log/section and more on lithologic descriptions. Review of regional Appalachian Plateau stratigraphy. Determine pace. Pace and compass exercise on campus. Quiz on leveling and basic stream hydrology Finished stream survey map and discharge calculations due
S	May 29	Rocky Run stratigraphic section

F	June 4	More Brunton compass review; measuring strike, dip, lineation, and rake. Closing a traverse in a mapped area. Outdoor exercise on concepts. Quiz on campus regional stratigraphy and lithology concepts Finished Rocky Run stratigraphic column due
S	June 5	Boulder Field mapping exercise

F	June 11	Structural geology review. Interpreting cross-sections. Background on Sideling Hill and Valley and Ridge stratigraphy. Quiz on Brunton usage (strikes and dip) and/or mapping
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		Finished map for Boulder Field due
S	June 12	Round Top Hill traverse exercise (near Hancock, MD)

F	June 18	Structural geology review (part II). Stereonets and true dip calculations from apparent dip. Quiz on cross-sections and structure concepts
S	June 19	Round Top Hill traverse exercise (part II)(near Hancock, MD) Sideling Hill stop

F	June 25	Overview of sedimentology and stratigraphy of Ordovician-Devonian in PA Tectonic history of Ordovician-Devonian in PA Quiz on stereonet Round Top Hill maps due
S	June 26	Laurel Creek and Reedsville structure and stratigraphy exercises