

Geology 100: Geology in the Field

TTh 1:00–5:00 PM, Mudd 68

Fall 2009
Carleton College

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Introduction. This course is perhaps unlike any other course you have ever had. There is no textbook, there are no right answers, but there are certainly wrong ones. The goal is to have you construct your knowledge of how the Earth works based on observations you make in the field. Having said that, there is information about the Earth that you can't directly observe in the field, and we will fill that in as needed, hopefully in response to your questions. So be curious, make detailed observations and ask many questions of the rocks, each other, the TA's and me.

Office Hours: stop by, or by appointment.

Evaluation: Participation (including TMYN*) – 10%
 Field reports and other activities – 50%
 Final project – 40%

Week	Date	Topic
1.	T, Sept. 15	Introductions and course overview; Deep Time.
	Th, Sept. 17	Little Chicago
2.	M, Sept. 21	Field Report 1 Due (Little Chicago)
	T, Sept. 22	Rocks and Minerals
	Th, Sept. 24	Sogn
Sunday, Sept. 27, 8:00 AM: Taylor's Falls ALL DAY field trip. We will return by 6:00 PM; Backyard Barbeque for dinner		
3.	T, Sept. 29	Sogn
	Th, Oct. 1	No Class; Work on Sogn Reports
4.	M, Oct. 5	Field Report 2 Due (Sogn)
	T, Oct. 6	Cannon River Discharge (hand in same day)
	Th, Oct. 8	Mapping: Cannon River Wilderness Park (CRWP)

5.	M, Oct. 12	CRWP Map and Cross-section Due
	T, Oct. 13	Red Wing
	Th, Oct. 15	Red Wing
Black Hills Field Trip! Oct. 17-21. (Sign-up with Tim Vick, Mudd 69B, tvick@carleton.edu .)		
6.	T, Oct. 20	No Class: Field Trip
	Th, Oct. 22	Work on Red Wing Reports
7.	M, Oct. 26	Field Report 3 Due (Red Wing)
	T, Oct. 27	Plate Tectonics activity
	Th, Oct. 29	Minnesota River Valley ALL DAY field trip. 8:00 AM - 9:00 PM?
8.	T, Nov. 3	Climate Change activity
	Th, Nov. 5	Energy and the environment activity (wedge game)
9.	T, Nov. 10	Lecture; work on final reports
	Th, Nov. 12	Lecture; work on final reports
10.	T, Nov. 17	Class party at Chapati?
	M, Nov. 23	Final Paper Due

Black Hills Field Trip (October 17-21). Mark your calendars! This is a great (free) opportunity to visit and learn the geology of the Badlands and Black Hills of South Dakota. We leave Saturday, Oct. 17 and return Wednesday, Oct. 21. We will visit some amazing outcrops of Precambrian granite, pegmatite, and metamorphic rocks and Phanerozoic sedimentary rocks. We will drive in a coach bus and camp. If you choose to go, you must contact the professors in your other courses ASAP to see if they can accommodate this trip. This is an annual tradition in the geology department, so most professors will know about it. I strongly encourage you to make it happen and join us!

Field Work. Most of the time will be spent outside, rain or shine, making observations and taking notes. To be happy in the field, make sure you are prepared:

rain gear
tennis shoes or light hikers (will get dirty)
zip off pants
water bottle
snack (e.g. granola bars, apple)
sun hat

warm hat
gloves
fleece jacket
sunscreen
field book
hand lens

mechanical pencil
extra leads
eraser
colored pencils

Geology 100: Field Report Instructions*

Field reports consist of two principal sections. The first section is a careful description of the locality (or localities) visited including place names and GPS coordinates. The second section is an interpretation of the geologic history of the locality that is built upon the observations described in the first section. Typically, a field report will be about one page of text, but there are no length requirements or restrictions.

Field reports should be written as formal, scientific reports; they are not travel diaries. Clarity is of utmost importance, and try to avoid sweeping generalizations and ambiguity in what is said. Use compass directions where appropriate. Use quantities (e.g. 0.5 m) rather than relative values (e.g. large) in statements of size, distance, elevation, etc. Use SI (metric) units.

Use photos and sketches from the field as part of your description and as evidence in your interpretive arguments. A photo in a scientific report is not a decoration; photos are data. When a photo or field sketch is included, label it as a figure (e.g. Figure 1) and give it a caption; be sure to refer to the figure in the text. Use figures to make your descriptions more clear to the reader. Tell the readers what to look for in each figure and why you are asking them to look at it. In many cases figures and photos are more effective if important features are labeled.

You can label photos electronically with an image program like Photoshop and figures are best made using Adobe Illustrator. Both programs are available to geology students on the computers in Mudd 75.

Submit your field report electronically using your “Hand In” folder under student work in the course folder. The final product should be a Microsoft Word document. Please name the file LastName1.doc, where the number is the number of the field report (e.g. DavidsonYangSmith1.doc). Comments will be written on the report electronically and the report will be returned to you via e-mail or in your course folder. If one of the computer gods does not smile on you, or if you prefer to work with hard copies, you may place a printed copy of your field report under my office door (Mudd 160).

** Some of the text in these instructions is borrowed from John Brady who teaches a similar course at Smith College.*

Final Reports: Stratigraphic Section and Geologic History of Minnesota.

Carleton is particularly fortunate to reside in a state with a rich geologic history preserved in the rock record. The primary goal of this course is to discover this history through observations we make in the field using a rock hammer, hand lens, and recording this information in our field books. By the end of the course, we will have enough information to piece together a composite stratigraphic section for southern Minnesota. Armed with this powerful piece of information, you will write a short (~5 pages) narrative of the geologic history of southern Minnesota complete with figures, including your stratigraphic section. Please use the primary literature as much as you want to supplement your narrative. However, you should focus on what your data tell us about the relative timing of events and processes of formation of the different rocks we encounter. If you do use the primary literature, you must cite these sources following standard practices in the earth sciences.