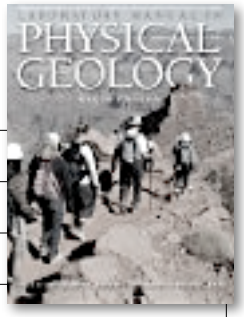
Th 6:40-9:30, SC 166
Spring 2012
Steven Newton

Geology 120L Physical Geology Lab

Required text: AGI/Busch, *Laboratory Manual in Physical Geology, 9th*, 0321689577



Lecture schedule:

	date	topic	quiz	activity
1	Th 26 Jan	intro	-	-
2	Th 2 Feb	Mineral properties	-	Lab 3
3	Th 9 Feb	Minerals	Min prop	Lab 3
4	Th 16 Feb	Igneous	Minerals	Labs 4, 5 *Mineral report due*
5	Th 23 Feb	Metamorphics	Igneous	Lab 7 *Igneous report due*
6	Th 1 Mar	Sediments	Metam.	Lab 6 *Metamorphic report due*
7	Th 8 Mar	Topographic maps	Sed.	Lab 9 *Sedimentary report due*
8	Th 15 Mar	Geologic maps	Topo	Lab 10
9	Th 22 Mar	Landslides, water	Geol map	Lab 11, 12
10	Th 29 Mar	Glaciers; Coasts	Landslides	Lab 13, 15
11	Th 5 Apr	Google Earth lab	Glaciers	-
	Th 12 Apr	*Spring break*		
12	Th 19 Apr	Tectonics	-	Lab 2
13	Th 26 Apr	Earthquakes	Tectonics	Lab 16
14	Th 3 May	Time	Earthq.	Lab 8
15	Th 10 May	Fossil lab	Time	"
16	Th 17 May	Climate	Time 2	Lab 13
17	Th 24 May	Make-up labs		-

Grading:

quizzes (1 throwout)	20%
hand-ins (1 throwout)	20%
Mineral Report:	10%
Igneous Report:	10%
Metamorphic Report:	10%
Sedimentary Report:	10%
Presentation	10%
Field trip	10%

- Please turn in your reports promptly; I will, however, accept late reports with a point penalty
- "Hand-ins" are sheets I will give you to fill out as you go through the day's lab
- Final grade assignment will be by a 90%-A, 80%-B, 70%-C, 60%-D, 59%-and below-F scheme.

Reports:

An important part of your grade will be a series of written reports about minerals and the three rock types. These will be brief—a couple of pages. I will explain the specifics of what I'm expecting for each report before it is due.

In general, the reports should include:

1) a discussion of the definition (i.e., what makes a mineral a mineral? what is not a mineral?)
2) the major types (for minerals, start by describing the varieties of feldspar, quartz, mica, etc.)
3) photographs (perhaps ones you've taken in class, or downloaded from images.google.com)
4) descriptions of at least three Internet sites you've found useful for obtaining information on the subject (real sites--not just Wikipedia :))

Presentation:

I want you to give brief (10 minute) presentation on a topic to be selected. These topics will match what we are going over on a particular day and will complement the lab topic.

If you wish to speak without software, that's fine, but most people will prepare a PowerPoint or Keynote for their talks. You can read my thoughts on making effective presentations here: http://sciencedenial.blogspot.com/2011/10/whats-wrong-with-scientific.html. You can email me finished talks, bring them in on a flash drive or CD, or use your own laptop. If you are bringing in a Mac laptop, be advised that you will need a VGA adaptor specific to your Mac model.

Field trips

I would like you to attend at least one Saturday or Sunday field trip during the semester. I will announce dates later in the term. You should plan on providing your own transportation or caravanning with other students. We will examine rocks in the Marin area and, I hope, give you a better understanding of the geology under our feet.

Reaching me:

The quickest way to get ahold of me is: geology.prof@yahoo.com
I can also be reached at: snewton@mycom.marin.edu
My office phone is 415.485.7526

Office hours:

Where: Science 165 (across hall from classroom)
When:

- MW: 10-11 am, M 2:30-3 pm
- TTh: 5:30-6:30 pm
- I will be happy to arrange other meeting times, if needed

Course web page:

This course has a Moodle page, http://moodle.marin.edu/course/view.php?id=2536 on which I will post lecture outlines, links, and notes.

I will also repost this information on: http://www.blackquartz.com/geology.html

Lecture notes will be posted as .pdf files, and students have benefited in previous terms from printing notes out beforehand as a guide for note-taking.

Catalog description

Geology 120 L, Physical Geology Laboratory, A three hour, one student unit laboratory course in Physical Geology. This laboratory course consists of a hands on study of Earth materials and geologic processes. The focus of the course is the identification of naturally forming minerals, and rocks, the interpretation of both topographic and geologic maps and the use of these maps as fundamental tools in the investigation of ground and surface water conditions and the geo-technical assessment of seismic and slope stability hazards found in local areas. Field trips to local areas of interest are included.

Student learning outcomes

Upon completion of this course, students will be able to:
1. Describe and discuss the principles of physical geology
2. Identify rock and mineral specimens common to earth
3. Describe and discuss the geology and fossils of each geologic period, and

4. Identify fossils representative of each geologic period.
5. Reconnoiter the earth with high precision using a topographic map, compass and protractor
6. Calculate stream discharge, read a flood frequency and hydrography and predict flood events based on the data provided
7. Make structural cross-sections from geologic maps and develop the geologic history of the area based on that cross-section
8. Demonstrate the ability to use a microscope
9. Exhibit the ability to record field observations of exposed rock.
10. Using a brunton compass, obtain the attitude of bedding plains, joints, and faults in the field
11. Identify the common forms of faults and folds expressed in exposed rock

Critical thinking:

1. All successful students will exit this course with the ability to identify common minerals, igneous, sedimentary and metamorphic rocks. Given a set of igneous rocks the student will be asked to discuss the tectonic processes that have led to the formation of that igneous rock. Analysis of the formation of these stones is essential for the working geologist.
2. All students exiting this course will have the ability to draft from a geologic map a structural cross-section illustrating the subsurface conditions and by applying the fundamental principles of Geology, define the chronological steps, geo-tectonic forces and lithospheric processes that have led to the formation of the terrain illustrated by the structural cross-section. This effort requires a synthesis of concepts.
3. All students will possess the skills to determine the Dissolved, Suspended, and Bed Load, i.e. the total mean daily load, of any stream system as well as the discharge of that stream system.
4. All students exiting this course will have the ability to read a graph, table, pie chart, or any other drafted illustration intended to define the concentration of various pollutants
5. All successful students will have the ability to replicate the Eras, Periods, and epochs of the Geological Society of Americas Geologic Time Chart
6. All students exiting this course will be able to illustrate the tectonic processes that have led to the formation of the State of California and have the ability to recognize active faults.
7. All students exiting this course will have the ability to locate the epicenter of a seismic event and discuss at a high level of geotechnical expertise the modified Richter Scale.
8. All students exiting this course will have the ability to define the area contained within a watershed, the order of the surface drainage of that water shed, and be capable of generating and interpreting a hydrograph and flood frequency curve generated for that drainage basin.
9. All successful students exiting this course will be able to recognize common massive sulfide minerals and relate the mineral to the economic metal extracted from that mineral.
10. All students will be able to discuss the more common elements extracted from common minerals
11. All students will exit this course with sufficient cartographic skills to define the Longitude and Latitude of a point on planet Earth, provide the Land Office Grid System Coordinates of any given area defined by any scale of Topographic or Geologic map presented and have the skills to read both Azimuth and Compass Quadrant compass systems.
12. All students will be able to employ Darcy's equation to calculate rates and directions of ground water flow and discuss at a high level of geotechnical expertise specific problems denizens of the northern California Coast Ranges face in terms of available fresh water

Other stuff:

Please turn off cell phones and pagers prior to class commencement. Please do not text-message.

This course is meant as a transferable equivalent of an introductory physical geology course at the university level. For attendance and conduct policies, please see the catalog.

Plagiarism occurs when a students misrepresents the work of another as his or her own. Plagiarism may consist of using the ideas, sentences, paragraphs, or the whole text of another without appropriate acknowledgement, but it also includes employing or allowing another person to write or substantially alter work that a student then submits as his/her own. Any assignment found to be plagiarized will be given an "F" grade (and could result in an F in the class). All instances of plagiarism will be reported to the Dean of the Division, and further action may be taken by the College.

I wish to make this course as accessible as possible to students with disabilities or medical conditions that may affect any aspect of the course assignments or participation. I encourage you to communicate with me at the outset of the course any accommodations that will improve your experience of (or access) to the course. If you feel this is appropriate for you, I encourage you to talk to Disabled Student Services, at 415.485.9406, about how to improve your experience here.

General study tips:

The following is a list of suggestions for you to improve your experience for my class:

1. Take notes.
   Most terms there are some students who just sit in class, their arms folded, staring at me and not taking notes. I don't know how they expect to pass the class—and, generally, they don't. To do well, at a bare minimum, you need to write down everything important I say in the class.

2. Prepare for essay questions by outlining.
   Essay questions will not be a surprise to you in this class; when you see the test question, you'll realize that I spent a lot of time discussing these major topics. Before the test, take a blank sheet and try to answer a major question cold. Then go back to the notes and see what you missed. Then repeat this process a day later, gradually filling in the gaps. Using this method, you'll have it firmly in your grasp by test time.

3. Make a mnemonic to help you remember key points.

Many years ago, in a class on graphic design, I learned that the four cardinal aspects of good design are: Contrast, Repetition, Alignment, Proximity. How do I remember these?

4. Learn the vocabulary.
   Science requires learning a lot of vocabulary, as does any foreign language. If you were taking German or Russian, you would of course make flash cards to help you learn the vocabulary—and most importantly, to help you identify which words you had not mastered. Do the same in this class.

5. Don't sweat the spelling.
   Ey ham naught goin two take uff fur schpellin sow lang az eye kan mayk out da wurd. Eye no itz hawd with zeez weird siunc werds.

6. Never use "like."
   Using "like" in formal writing is a mistake. Do not say what an object is *like*; say what it *is*. You might object that you want to make analogies: A ship to an ocean is like a plane to the sky. Don't try to be cute. ☺ Just tell me what it *is*.

7. The possessive of "it" does not use an apostrophe.
   Some professors think that if a student does not know this by college, then it's a hopeless case. However, I am an optimist, and I think that this mistake—and its hold on students—well, it's just one more thing to learn.

8. Leave margins. On essay questions, do not take up every bit of space on the page. Leave me some room to write comments. Ask for more paper if you need it.

9. "Data" is plural. Do not write, "The data shows…" Instead, write: "The data show…"

10. Be specific. Do not be vague.
    Science is all about the details. Back up your statements with numbers and facts.