

Geology 101 – Fall 2009 Rachel Beane & Joanne Urquhart

Tues & Thurs 8:30 – 9:55am Druckenmiller 004

Laboratories

Tues (1-4pm) or Fri (1:30-4:30pm) Outside or Druckenmiller 212

Dynamic processes such as earthquakes, volcanoes, and mudslides shape the earth on which we live. As part of this course, we will explore rocks exposed along Maine's coast, and do our best to interpret the processes that formed them (recognizing that geologists often must work with incomplete data).

Overarching course goals are for you

- To interpret geologic history (based on field observations, knowledge of rock types, geologic maps, rock structures, and principles of relative dating)
- To make connections between minerals and rocks, structures, plate tectonics, and crustal and deep-earth processes
- To pose and evaluate hypotheses and questions
- To make interpretations based on incomplete data
- To synthesize the geologic history of Maine's coast
- To describe what geologists do

Skill goals are for you

- To collect and interpret your own data (using tools such as a hand lens, microscope, Brunton compass, and measuring tape)
- To create and analyze maps and graphic data
- To apply physical properties to the identification of minerals
- To differentiate clastic and crystalline textures in the identification of rocks
- To read for scientific information
- To communicate geologic information
- To make 3D interpretations
- To work individually and collaboratively

How to reach us

Prof. Rachel Beane, 120A Druckenmiller 725-3160; rbeane@bowdoin.edu
Office hours are Monday 1:30-2:30 pm,
Friday 11am-noon, and by arrangement.

Joanne Urquhart, 116 Druckenmiller Hall 725-3806; jurquhar@bowdoin.edu Office hours are Tuesday 7-8pm and by arrangement.

TAs: Jane Koopman '10 <jkoopman@bowdoin.edu> Rachel Eveleth '11 <reveleth@bowdoin.edu>

How your grade will be determined

Laboratory exercises and exam	40%
Vinalhaven Project	20%
Exam I	15%
Exam II	15%
Participation, assignments, quizzes	10%

Field project: A key part of this course is a multi-week geologic project. This year's project begins with field research on Vinalhaven Island on Saturday, September 26. We drive to Rockland, then take a ferry over to Vinalhaven. On Vinalhaven, we can see geologic features that we cannot see near campus, and ones that geologists have travelled from across the country to study.

Active participation is a valuable means of learning and is expected during class, laboratory exercises, and field trips. Your participation in all laboratories and field trips is required to pass the course. You should be prepared for cold, warm, wet, or sunny weather, and for slippery or rough terrain during field laboratories – it's all part of being a field geologist. For classes and labs, you should bring a 10x hand lens, ruler, and protractor.

Please refrain from using portable-electronic devices, and from non-course related internet use, during classes, laboratories, field trips, and office visits.

Collaboration is usually encouraged for scientists seldom work alone. Many class and laboratory exercises will involve collaboration. For most assignments, however, I expect that the writing and final analysis will be your own. When appropriate, please acknowledge those with whom you have worked or from whom you have received ideas. Plagiarism and cheating (for laboratory assignments, papers, quizzes, exams, or anything) are not acceptable. "Sources": http://www.dartmouth.edu/~sources/ is a good reference as to what constitutes plagiarism. Please ask us, or consult the Student Handbook, if you have questions as to what constitutes academic dishonesty.

The Writing Project offers drop-in conferences during evening workshops. We encourage you to use the Writing Project for your paper and for laboratory write-ups. The conferences serve students in any course who would like feedback on a draft or assistance at any stage of the writing process. For more information on times and locations, please visit its website < http://academic.bowdoin.edu/writing-project/ >.

Please note: We ask students with learning, physical or psychiatric disabilities who are taking this course and may need class, laboratory, or field-trip accommodations, to discuss those needs with us as soon as possible. Also, if you have not done so already, please contact the Office of the Dean of Student Affairs to discuss your accommodation request.

Please recognize that the syllabus may change as the semester proceeds. The order of the course is based in part on when the weather is usually more favorable for field work (early fall) and on when we need low tides to access particular outcrops for labs. Changes to the syllabus, as well as laboratory and other assignments will be posted on the course web page at http://blackboard.bowdoin.edu. The listed readings are from Grotzinger, Jordan, Press, and Siever 2007. *Understanding Earth.* 5th ed. Please read assignments before the class.

Sep 3	Earth Materials: Minerals	Ap. 4
8	Earth Materials: Rocks	Ch. 3
10	Topographic maps	p. 4, 532-6
	Field Lab 1: Coastal Studies Center	
	Plate tectonics: Unifying theory	Ch. 2
17		p. 153-4
	Field Lab 2: South Portland	
22	Igneous rocks: solids from melts	Ch. 4
	Minerals and Rocks: campus field trip	
	Lab 3: Mineral Quiz	Quiz
26	All day field trip to Vinalhaven Island	
29		
Oct 1		Ch. 5
	Lab 4: Vinalhaven Project	
6	Sedimentation continued and Metamorphism introduced	Ch. 6
8	Metamorphism: Modification of rocks by Temperature and Pressure	
	Field Lab 5: Giant Stairs – Part 1	
13	Fall Vacation – no class	
15	Deformation: Modification of Rocks by Folding and Fracturing	Ch. 7
	Field Lab 6: Garrison Cove	
20	Deformation, Modification of Deales by Folding and Freetuning	
20	, ,	Ch. 8
	Clocks in Rocks: Timing the Geologic Record Field Lab 7: Hermit Island	CII. 6
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27	Review	
29	Exam I	Exam
	Field Lab 8: Giant Stairs – Part 2*	

^{*} Parents Weekend is October 30-November 1. Families are welcome to join us on either the Thursday or Friday lab to Giant Stairs.

Nov 3	Evolution of the Continents	Ch. 10
5	Interpreting Geologic Maps	
	Lab 9: Vinalhaven project	
10	Volcanoes	Ch. 12
12	Volcanoes continued	
	Lab 10: Vinalhaven project	
17	Earthquakes	Ch. 13
20	Earthquakes continued	
	Lab 11: Scavenger Hunt / Photo captions	
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24	Vinalhaven Project presentations	Presentations
26	No class – Thanksgiving Vacation	Presentations
	, ,	Presentations
	No class – Thanksgiving Vacation	Presentations
	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior	Ch. 14
26	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior Review	
26 Dec 1	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior	
26 Dec 1 3	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior Review Lab 12: Lab practical final	Ch. 14
26 Dec 1 3	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior Review Lab 12: Lab practical final Exam II	
26 Dec 1 3	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior Review Lab 12: Lab practical final Exam II Geologic Research	Ch. 14
26 Dec 1 3 8 10	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior Review Lab 12: Lab practical final Exam II Geologic Research Lab 13: Lab practical final	Ch. 14 Exam
26 Dec 1 3	No class – Thanksgiving Vacation No lab – Thanksgiving Vacation Exploring Earth's Interior Review Lab 12: Lab practical final Exam II Geologic Research Lab 13: Lab practical final	Ch. 14