

**EARS 33 – Earth Surface Processes and Landforms
Fall 2009**

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Lectures: Mon, Wed, Fri 12:30-1:35 pm, X-period Tues 1:00-1:50; Fairchild 213
Lecture slides will be posted on Blackboard.

Labs: Mon, 3:00-5:00 pm, Fairchild 116 (we may return a little late from field
labs. Talk to me if this is a problem for sports or other activities.)

Office Hours: By appointment or drop by (door is usually open)

Class Web Site: <http://blackboard.dartmouth.edu>

Required Texts: *Surface Processes and Landforms*, 2nd Edition, by Don J. Easterbrook
Available at Wheelock Books

Course Objectives: The primary objective of the course is to explore the processes occurring on the surface of the Earth which shape the landscape. At the end of the course, my hope is that you will be able to stand on a mountaintop wherever you may travel and be able to make educated hypotheses about why the landscape looks the way that it does. This is an interesting topic because the landscape is the part of geology that is most readily accessible to the public; the geology that most people see every day. You'll never look at a landscape the same way again! A major part of this course will be the lab exercises, where we will learn some geology/geography field techniques and work with data to understand various processes.

Cape Cod Fieldtrip: We will spend 2 nights (~2 days) on Cape Cod (**October 30 – November 1**) exploring the glacial, coastal, and eolian processes and landforms of the Cape Cod region. We will be camping at the Nickerson State Park Campground and spending our days conducting field work on the beaches, dunes, and glacial moraines on Cape Cod. This should be a beautiful time to be on the Cape with the fall foliage, although you will need to bring warm clothing for camping during cold nights. **We will plan to depart at 12:30 pm (class time) on Friday, October 30, and return around 5 pm on Sunday, November 1.** You will need to have your own sleeping bag, clothing (including RAIN gear!!) and good footwear (trail runners or low-top hiking boots are fine), and we will supply tents and vehicles and any other needed equipment.

Course Requirements and Grading:

Labs (35% of grade): There will be 6 different lab assignments during the term. You will have ~1 week to complete each report after the final lab period for that exercise. The largest lab write-up will be based on data collected during the Cape Cod field trip, and will be weighted twice as much (10%) as other labs (5% each) to reflect the larger time commitment.

Class Quizzes (10% of grade): There will be a few short, in-class quizzes during the term. These will be based entirely on the required reading, and should be relatively straight-forward if you have done the reading.

Class Participation (10% of grade): Includes attending classes prepared, promoting class interaction, and submitting at least 1 question per week about the reading or lectures via email. The question each week will be due by 8 am on each Friday. We will go over questions during the lecture each Friday.

Midterm Exam (20% of grade): This will be a 2-hour midterm exam **scheduled on Wednesday October 21st during class (time subject to adjustment)**

Final Exam (25% of grade): The cumulative final exam is **currently scheduled for December 8th at 8:00 am.**

Disability-Related Accommodations: Students requiring disability-related accommodations must register with the Student Accessibility Service office. Once SAS has authorized accommodations, students must show the originally signed SAS Accommodations/Consent Form and/or a letter on SAS letterhead to their professors. As a first step, if you have questions about whether you qualify to receive accommodations, you should contact the SAS office. All inquiries and discussions about accommodations will remain confidential.

Religious Observances: If you have a religious observance that conflicts with your participation in this course, please meet with me at the beginning of the term to discuss appropriate accommodations.

Academic Honor Principle: You should be aware of and conform to the Dartmouth Honor Code as expressed in the ORC. For this course, this means:

Labs: You may discuss the lab assignments with each other and work together towards solutions, but you must write up your solutions in your own words showing your thinking and work where appropriate. If you are working in groups then you may share data with group members, but write-ups should still be in your own words.

Exams: All work on exams is your own, with no unauthorized assistance (e.g. notes, books, etc.).

Tentative Schedule (Updated 9/21/09)

Date	Day	Lecture/Lab Topic	Required Reading
Week 1		No Lab	
9/23	Wed	Introduction to geomorph, basic principles	Ch. 1
9/25	Fri	Overview of plate tectonics and geological time	Ch. 2
Week 2		Lab 1: Tombstone Weathering Lab I	
9/28	Mon	Mechanical weathering	Ch. 3 pp. 13-22
9/30	Wed	Mechanical and chemical weathering	Ch. 3 pp. 22-40
10/2	Fri	Soil development and distribution	Ch. 3 pp. 40-50
Week 3		Lab 1b: Tombstone Weathering Lab II	
10/5	Mon	Mass wasting and slope evolution I	Ch. 4 pp. 56-64
10/7	Wed	Mass wasting and slope evolution II	Ch. 4 pp. 64-91
10/9	Fri	Hydrologic cycle and watersheds	Ch. 5 pp. 97-101
Week 4		Lab 2: Slope Stability Lab	
10/12	Mon	Fluvial Processes	Ch. 5 pp. 102-137
10/14	Wed	Fluvial Landforms I: Drainage, deltas, floodplains	Ch. 6 pp. 144-166
10/16	Fri	Fluvial Landforms II: Cycle of erosion	Ch. 6 pp. 166-182
Week 5		Lab 3: Fluvial Processes Lab	
10/19	Mon	Groundwater, subsidence, karst landscapes	Ch. 7
10/20	Tues	X-Period Midterm exam review/question session	
10/21	Wed	MIDTERM EXAM	Ch. 1-7
10/23	Fri	Coastal processes & landforms I: Waves, erosion	Ch. 16 pp. 428-442
Week 6		No Lab	
10/26	Mon	Coastal processes & landforms II: Beaches	Ch. 16 pp. 442-466
10/28	Wed	Coastal processes & landforms III: Cape Cod	
10/30	Fri	NO CLASS – depart for Cape Cod fieldtrip at 12:30 pm	

Week 7			Lab 4a: Cape Cod lab Workup I
11/2	Mon	Glacial morphology and processes	Ch. 12
11/4	Wed	Glacial processes and landforms I: Erosional	Ch. 13 pp. 333-341
11/6	Fri	Glacial processes and landforms II: Depositional	Ch. 13 pp. 341-361
Week 8			Lab 5a: Glacial Landforms of NH and VT I
11/9	Mon	Quaternary Climate Change and Ice Ages I	Ch. 14 pp. 364-388
11/11	Wed	Quaternary Climate Change and Ice Ages II	Ch. 14 pp. 388-393
11/13	Fri	Quaternary Climate Change and Ice Ages III	Ch. 14
Week 9			Lab 5b: Glacial Landforms of NH and VT II
11/16	Mon	Periglacial Landforms & Tectonic Landforms I	Ch. 8, 15
11/18	Wed	Tectonic Landforms II	Ch. 9-10
11/20	Fri	Igneous Landforms	Ch. 11
Week 10			Lab 4b: Cap Cod Lab Workup II
11/23	Mon	Dating of Geomorphic Features	Ch. 18
11/25	Wed	NO CLASS – Thanksgiving Break	
11/27	Fri	NO CLASS – Thanksgiving Break	
Week 11			Lab 4c: Cape Cod Lab Workup III
11/30	Mon	Geomorphic evolution of New England	TBD
12/2	Wed	Course review	Ch. 1-18
Week 12			No Lab (reading/exam week)
12/8	Tues	8:00 AM FINAL EXAM (or as agreed upon at another time)	