GEOLOGY 251b

GEOMORPHOLOGY

Spring 2001

Robert M. Newton

Office: Burton 207
Office hours: WF 11-12; Th 8:30-10 or by appointment
Phone: ext. 3946
e-mail: rnewton@science.smith.edu

Course Web Page (CourseInfo)
The course web page contains information and resources. It will be used for on-line quizzes and will provide, information on assignments, study guides for exams, tutorials to help landform identifications and data for analysis in projects. Consult it often!

Textbook
D. Easterbrook, *Surface Processes and Landforms* 2rd edition.

Course Description
Geomorphology is the study of landforms and the processes that create them. In the course we examine how factors such as climate and bedrock structure influence landform development. Landscapes are examined through the use of topographic maps, air photos and during field trips. During the course you will learn how to use the Global Positioning System (GPS) and Geographic Information System (GIS) software to create maps of geomorphic features

Course Goals
1) to learn to interpret the geologic history of an area from observations of the surface morphology
2) to understand the importance of earth surface processes in geology and in our lives
3) to be able to know what to do to evaluate the geomorphology of an area
4) to be able to read topographic maps and aerial photographs
5) to be able to interpret surficial geologic maps
6) to be able to use GPS receivers to collect data
7) to be able to use ArcView GIS software to create and analyze geomorphic maps.

Weekend Field Trip
There will be a required weekend field trip to the White Mountains of New Hampshire leaving Friday evening April 21 and returning Sunday evening April 23. During this trip we will do a mapping project in the Ossipee Lake quadrangle. The field project report will be due on April 28. Failure to attend this field trip will result in a grade of zero.

Grade
Your grade will be based on written assignments (40%), on-line quizzes (10%) a mid-term exam (20%) and a final (30%). Exam questions will be selected from a group of questions posted on the course web page one week before each exam. Written reports must be turned in on time. There will be a 10 percent penalty for each day the assignment is late. The on-line quizzes will cover the textbook reading assignments and must be taken prior to the class in which the assignment is due.

Assignments and Student Responsibilities
You must come to class prepared! You should be prepared to discuss and ask intelligent questions on the material covered in the reading assignments.

Meeting Schedule

Date	Class	Laboratory
1/29	Introduction	Map and photo Interpretation
1/31	Geomorphology of North America	
2/2	Geomorphology in tilted and folded rock terranes	
2/5	Folded rock terranes: The Appalachians	Connecticut Valley Digital Elevation Model
2/7	Fractures –Yosemite to Adirondacks	
2/9	Finding Active Faults	
2/12	Impact of Faults on landscape development	Mapping geomorphic features in folded and faulted terrains
2/14	Satellite Imagery	
2/16	Mapping the Meatiq Dome using Landsat Imagery	
2/19	Volcanic processes	Volcanic landscapes
2/23	**NO CLASS**	**RALLY DAY**
2/26	Identifying Volcanic Landscapes	
2/28	Glaciers	Glacial erosion and Alpine Landscapes
3/2	Glacial erosion and Continental landscapes	
3/5	Glacial Deposition	
3/7	Landforms of glacial deposition	Moraines and Drumlins
3/9	Meltwater stream deposits	
3/12	Morphologic classification of stratified drift features	
3/14	Morphologic Sequence Mapping	Morphologic Sequence Mapping
3/16	MID TERM EXAM	
	SPRING	**BREAK**
3/26	Dating Methods in Geomorphology	
3/28	History of Glacial Lake Hitchcock	Field Trip: Glacial Lake Hitchcock
3/30	Physical mineral weathering	
4/2	Chemical weathering I	
4/4	Chemical weathering II	Field Trip: Soils of the Connecticut Valley
4/6	No Class Keck Symposium	
4/9	Soil Formation	
4/11	Slope stability	Field Trip: Slope Stability problem Leeds Massachusetts
4/13	Mechanisms of mass wasting	
4/16	The role of water in causing slope failure	
4/18	Groundwater hydrology	Field Trip: Discharge measurement on West Brook and Roaring Brook
4/20	Groundwater and Karst terranes	
4/23	Surface Water Hydrology	
4/25	Hydrographs	Field Trip: Mill River and Connecticut River floodplain
4/27	Flow duration Curves	
4/30	Flood Frequency Analysis	
5/2	River Channel Dynamics	Field Trip: Northampton Reservoir and Smith Experimental Forest
5/4	Watershed Analysis	
4/28	Summary and Review	