

Geology 402/502, Geomorphology



Fall 2006

Lecture: Monday, Wednesday: 10:00 to 11:15 am; PS 216

Lab: Monday 2:00 to 5:00 pm; PS 216

Website: <http://www.isu.edu/~crosbenj/Teach/Geo402>

Instructor: Ben Crosby, PS 229, 282-2949. crosbenj@isu.edu

Office Hours: Wednesday, 1:30 to 3:30 pm or as arranged by email

Lab Instructor: Joe Larsen, PS 207B, 282-2623, larsjose@isu.edu

Office Hours:

Text: Process Geomorphology, 4th edition, Ritter, Kochel and Miller, ISBN: 0-697-34411

Supplemental reading will be provided as necessary

Course Description:

This course explores the physical processes that sculpt the surface of the Earth. It is at the interface of the solid earth and the atmosphere that we can observe and attempt to quantify the interaction between tectonic, climatic and geomorphic processes. This course will cover:

- Hillslope processes including regolith formation, hydrology and mass movement
- Characteristics and metrics of drainage basins and river networks
- Fluvial processes including river morphology and sediment transport
- Glacial processes including ice mass balance, erosion mechanisms and landforms
- Feedbacks between climate, tectonics and erosion

The course stresses field investigation of geomorphic phenomena and the writing of scientific reports. We will utilize tools including: computer modeling, image analysis, and GIS analysis of digital elevation data.

Grading Scheme:	<u>% of grade</u>
3 Lab / Field Projects	65%
-Borah Fault Scarp Analysis	(20%)
-Portneuf River Fluvial Analysis	(25%)
-Glacial History Analysis	(20%)
1 Research Project and Presentation	35%

Labs

Monday afternoon sessions will be used for skill building, small field trips and field data analysis. Our Projects are on-going and will last multiple weeks. Though data analysis might be incomplete, I suggest outlining your report early on and filling it in as we go. Don't wait to write, and don't turn in labs late...they will be penalized.

Final Project

This independent, original work will be written in the format of a research proposal. You will research an interesting topic, perform a preliminary analysis and suggest hypothesis and methods for testing your hypothesis. This is as much an exercise in geomorphic analysis as in scientific thinking. Your final presentation should convince us all that your creative and rigorous approach deserves full funding!

Geomorphology Class Schedule

Week	Date	Topic	Book	Field Trips
1	Aug 21	Introduction, Course Focus, Field Trips, labs	1	
	Aug 23	<u>The Drainage Basin:</u> soil production and hillslope hydrology	3	Borah: Aug 25-,27?
2	Aug 28		5: 137	
	Aug 30		4	
3	Sep 04	----Vacation----	4	Borah: Sept 1- 4?
	Sep 06		4	
4	Sep 11	<u>Hillslope Transport Mechanisms</u>	4	
	Sep 13		5	
5	Sep 18	<u>River Networks:</u> hydraulic geometry and channel morphology	5	X
	Sep 20		6	X
6	Sep 25		6	
	Sep 27		6	Portneuf: 29,30,1?
7	Oct 02	<u>Fluvial Processes:</u> flow mechanics sediment transport alluvial and bedrock rivers river profiles transient response	6	
	Oct 03		6	
8	Oct 09		6	
	Oct 11		7	
9	Oct 16		7	
	Oct 18		7: 242	Glacial: 20,21,22?
10	Oct 23	<u>Fluvial Depositional Systems:</u> flood plains deltas alluvial fans	7: 233	
	Oct 25		7: 264	
11	Oct 30		7: 248	
	Nov 01		7	
12	Nov 06	<u>Glacial Mechanics and Landforms:</u> mass budgets basal erosion	9	
	Nov 08		9	
13	Nov 13		10	
	Nov 15		10	
14	Nov 20	Vacation Week!		
	Nov 22			
15	Nov 27	<u>Climate – Tectonics - Topography</u> glaciers and uplift bedrock rivers and uplift	2, sup.	
	Nov 29		2, sup.	
16	Dec 04		2, sup.	
	Dec 06		2, sup.	
17	Dec 11	<u>Student Presentations:</u> 10 to 12 am		