

Geology 402/502, Geomorphology



Fall 2007

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

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

Website: <http://geology.isu.edu/~crosbenj/teach/Geo402/index.htm>

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: Carrie Thomason, thomcar2@isu.edu

Office Hours:

Text: Process Geomorphology, 4th edition, Ritter, Kochel and Miller,

ISBN 13: 978-1-57766-461-1. Supplemental reading will also be provided

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>
Lab and classroom exercises	15%
3 Field Projects	55%
-Fluvial Project	(25%)
-Hillslope Project	(15%)
-Glacial Project	(15%)
1 Research Project and Presentation	30%
	100%

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!

Week	Date	Topic	Book	Field Trips	Lab Session	Projects
1	Aug 27 Aug 29	Introduction, Course Focus, Trips, Labs The Drainage Basin	1,2 5		Introduction to ArcGIS	
2	Sep 03 Sep 05	Labor Day Holiday River Networks:	5			
3	Sep 10 Sep 12	hydraulic geometry and channel morphology	5 6	Sept 15,16	Field Surveying Techniques	
4	Sep 17 Sep 19	Fluvial Processes:	6 6		Process Field Data	
5	Sep 24 Sep 26	flow mechanics sediment transport	6 6		Process Field Data	Fluvial Project
6	Oct 01 Oct 03	alluvial and bedrock rivers river profiles	7 7		Flume Demonstration	
7	Oct 08 Oct 10	transient response depositional systems	7 7	Oct 13,14	Regional Context	
8	Oct 15 Oct 17	Hillslope Transport Mechanisms	3,4 3,4		Field data collection	Hillslope Project
9	Oct 22 Oct 24	Hillslope Transport Mechanisms	3,4 3,4		Process Field Data	
10	Oct 29 Oct 31	Glacial Mechanics and Landforms:	9,10 9,10		Ben at GSA , aerial photo interpretation	Glacial Project
11	Nov 05 Nov 07	Glacial Mechanics and Landforms:	9,10 9,10		Glacial mechanics	
12	Nov 12 Nov 14	Climate – Tectonics - Topography	2, primary lit. 2, primary lit.		Profiles of Bedrock Rivers	
13	Nov 19 Nov 21	Thanksgiving Holiday				
14	Nov 26 Nov 28	Climate – Tectonics - Topography	2, primary lit. 2, primary lit.		Final Project Lab	Final Project
15	Dec 03 Dec 05	Anthro-Bio-Geomorphology!			Final Project Lab	
16	Dec 10 Dec 12	Student Presentations Gone to AGU			Presentations, interviews	
17	Dec 17 Dec 19	Final Report Due Monday				