GEOMORPHOLOGY - Earth Science 307 - Autumn, 2007

Instructor: Professor William Locke
Office: Traphagen Hall, room 223; 994-6918; wlocke@montana.edu
Office Hours: M/F 11-12 and any time my office door is open.
Textbooks: 1) D. F. Ritter, R. C. Kochel, and J. R. Miller; 2002, *Process Geomorphology* (4th), W. C. Brown, Dubuque, IA
2) Geomorphology Field Trip Notes

Course Summary	**Course Schedule**	**Lab Schedule**
Synopsis of topics covered in the course		
Techniques of topographic map interpretation		
Color Landform Atlas of the US - shaded relief maps, satellite images, and links		
Landforms of Canada - a nice (and growing) image gallery from the Geol. Survey of Canada		
The "Virtual Geomorphology" - from the Association of Polish Geomorphologists		

General Course Summary:

This course meets Tuesday and Thursday at **12:45 PM (possibly 12:30)** in room **204 Traphagen**. The labs meet in **100 Traphagen** Tuesday (Section 02) or Wednesday (Section 04) at **2:10 PM**, or **at the Motor Pool** (6th and Grant) for field trips. Please be punctual - we **will** start on time!

The study of geomorphology provides a working understanding of the terminology of landforms and the processes and history of landscape evolution. It serves the needs of geologists, geographers, soil scientists, construction engineers, and others for whom an understanding of the Earth's surface is essential. If you cannot recall the general principles involved with the work of water, wind, ice, etc., you should review your notes and text from the prerequisite course. Mention will be made in this course to material covered in Physical Geography (weather and climate) and Historical Geology, but only ESCI 111 OR 112 is **required**. Spreadsheet modeling of Earth surface processes makes CS 150 or equivalent experience essential.

The course grade will be based on two hour exams, a final exam, and lab exercises (field trip and/or map work and computer models). Weightings will be approximately 20, 20, 35, and 30%, respectively, with the weakest performance down-weighted by 5%. All test

scores are raw, and will be curved to about 15% A, 35% B, 35% C, and 15% D. In the context of this course:

- **A = Excellent knowledge and understanding of material, some evidence of creative thought, confidence in application of principles;**
- **B = Good knowledge of material, some minor lack of understanding and confidence in application, little creative thought;**
- **C = Fair knowledge of material, significant gaps in understanding, little demonstrated ability in application or creative thought;**
- **D = Adequate knowledge and understanding of material; and**
- **F = Unacceptable knowledge and understanding of material.**

In this course, you should **consider the textbook as your major source for information**. Class time will be used for **review, discussion, and summary**, thus the reading **must** be done prior to its assigned date. Given the wide range of backgrounds and interests represented in the students in this course, **it is your responsibility to request clarification** where necessary, and mine to provide it. **Questions - in class, by e-mail, or outside of class - are always in order**!

In class, I will emphasize material which I feel is significant, present a little new material, present case studies which display and develop the material in the text, and use slides of landforms and topographic maps to clarify important concepts. I also have Reference Quadrangles (topographic maps of a variety of landforms and landscapes) available in drawers (labeled "Reference Quads") in the labeled map case in Traphagen 116 - **please feel free to refer to them at any time (just keep them in order!)**.

Teamwork is encouraged in the labs. I will accept work submitted by teams provided that **team members number three (3) or fewer**, and **all names appear on the work**. If there is any substantial contribution from another class member, it must be acknowledged. Submission of substantively similar work without attribution is plagiarism, and is subject to class and University disciplinary action.

Course Schedule:

Day	Month	Date	Topic	Chapter
Tues	Aug	28	Introduction to Geomorphology	1
Thurs	Aug	30	Geomorphic concepts	2
Tues	Sept	4	Structural Processes, Landforms & Landscapes	2
Thurs		6	Volcanic Processes, Landforms & Landscapes; Climate	2
Tues		11	Chemical weathering and soils	3
Thurs		13	Soils and Geomorphology	3
Tues		18	Slope Processes and Landforms	4
Thurs		20	FIRST HOUR EXAM	1-4
Tues		25	Hydrology and Basins	5

Thurs	Sept	27	Fluvial Processes	6
Tues	Oct	2	Fluvial Landforms	7
Thurs		4	Fluvial Landscapes	7
Tues		9	Eolian Processes	8
Thurs		11	Eolian Landforms & Landscapes	8
Tues		16	Glacial Processes	9
Thurs		18	Glacial Landforms	10
Tues		22	Glacial Landscapes	10
Thurs		24	Glacial/Review	
Tues	Oct	30	SECOND HOUR EXAM	1-10
Thurs	Nov	1	Periglacial Processes & Landforms	11
Tues		6	Periglacial Landscapes	11
Thurs		8	Karst Processes	12
Tues		13	Karst Landforms & Landscapes	12
Thurs		15	Coastal Processes	13
Tues		20		
Thurs		22	THANKSGIVING HOLIDAY - NO CLASS	
Tues		27	Coastal Landforms	13
Thurs	Nov	29	Coastal Landscapes	13
Tues	Dec	4	Quaternary Stratigraphy - Causation	
Thurs		6	Review and assessment	
Tuesday	**Dec**	**14**	**FINAL EXAMINATION - 2 to 3:50 PM - TRAP 204**	**1-13**

FIELD TRIP AND LABORATORY SCHEDULE:
The focal point of this course is the development of familiarity with Earth surface processes, resultant landforms, and their interrelationships across space and time. The major hands-on tools for this purpose are field trips, topographic map interpretation, and computer modeling. Field trips will take precedence because of possible weather constraints, however, labs will meet regardless of the weather. Cancellation of trips will take place only in case of heavy rain or snow or excessive snow cover - the decision will be made by **noon** on lab days, and will be posted on the department chalkboard as well has on this Web page. In case of weather, the field trip will usually be held on the following week. Field trips will depart **promptly** at 10 minutes past the hour from in front of the Motor Pool (Sixth and Grant). All field trips will require the full 3 hours scheduled for them - please do **not** plan activities which will require you to return early. For liability, communication, and personnel management reasons, private cars will **not** be allowed to accompany field trips.

NOTE: It is *your* responsibility to dress appropriately for the field trips. Good walking shoes are strongly recommended and a windbreaker, rain gear, gloves, hat, and parka may be necessary.

Laboratory Schedule		
Week	**Field Trip**	**Other**
Aug 28/29	**NO FORMAL LAB THIS WEEK - browse "Techniques of topo map interpretation" link**	
Sept 4/5	**Field Trip #1 - Bridger Canyon**	
Sept 11/12		**Spreadsheet modeling - SCARP**
Sept 18/19		**Topographic Maps - Structural Landscapes**
Sept 25/26	**Field Trip # 3 - Gallatin Canyon**	
Oct 2/3		**Spreadsheet modeling - SCARP2**
Oct 9/10	**Field Trip # 2 - South Gallatin Valley**	
Oct 16/17		**Spreadsheet modeling - LONGPRO (Recipe)**
Oct 23/24		**Topographic Maps - Fluvial Landscapes**
Oct 30/31	**Field Trip # 5 - Paradise Valley**	
Nov 6/7	**Field Trip # 4 - Spanish Creek**	
Nov 13/14		**Spreadsheet modeling - GLACPRO (Recipe)**
Nov 20/21		**THANKSGIVING HOLIDAY**
Nov 27/28		**Topographic Maps - Glacial Landscapes or Spreadsheet modeling - SHORE**
Dec 4/5		**Review - Topographic maps**

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