EARTH SURFACE PROCESSES AND GEOMORPHOLOGY
GEOL 252
Syllabus
Lecture: MWF, 9:35-10:40 p.m.
Lab: M, 3-6 p.m. OR T, 1:30-4:30

What this course is about:

I basically see geomorphology as the one geology course that you will take that focuses almost exclusively on modern processes and the very recent geological past. Literally "earth form," geomorphology is the study of landforms: what controls their shape, what processes shape them, and how they have evolved through time. There are basically two flavors of geomorphology (that roughly mimic the two broad flavors of geology in general). *Process* geomorphology is the study of earth surface processes and the landforms they create. *Quaternary* geomorphology tends to emphasize how landforms and landscapes have evolved throughout the past 2 MA. In this course I will emphasize process over history.

Geomorphology might be one of the most useful courses you'll take, particularly if you're interested in environmental issues. Think about it: toxic waste and oil spills, climate change, groundwater contamination, natural disasters like landslides, floods, volcanic eruptions, etc. are all intimately involved with how the earth's surface works! That's what we're studyin' here and some of the techniques we'll use can be applied in a number environmental careers. In addition, remember the term 'uniformitarianism?' The *present* is the key to the past! By understanding modern (present) processes, we can learn quite a bit about the rocks.

The goals of this course:

- At the end of this course you should be able to drive just about anywhere and have some idea of how the land surface came to look the way it does.
- I would like for you to develop an awareness of the way earth surface systems behave and, maybe more importantly, interact with one another.
- I hope that by the end of the course you will be able to qualitatively identify a variety of landforms on the ground, topographic maps, aerial photographs, and satellite imagery.
- By the end of the course the process of observation, hypothesis-generation, testing, and synthesis (i.e. the "scientific method") should be deeply ingrained in you.
- You will begin to become comfortable with basic aspects of quantitative analysis of landforms and geomorphic processes.
- I hope to inculcate in you an appreciation of be abl

Reading:

Ritter: Ritter, D.F., Kochel, R.C., and Miller, J.R., 1995, Process Geomorphology: Third Edition. WCB McGraw-Hill, Boston, MA, 546 p.

As in many of my courses, the text should be used as a solid reference to back up my lectures and labs. It should be obvious to you which chapters apply to what we're covering in class because you all know how to use a table of contents and an index, so I may or may not assign many specific readings.

Grading:

Final grades will be assessed on the usual scale: A, 91-100%; B, 81-90%; C, 71-80%; D, 61-70%, etc. Your final grade will be determined as follows:

Labs:	35%
Homework and in-class assignments	10%
Research project on topic of your choice	20%
Midterm 1	10%
Midterm 2	10%
Final Exam:	15%
Total=	**100%**

Labs:

Labs are an important component of this course and are weighted accordingly. I will announce when labs will be due on a case-by-case basis. In some labs you will be able to work in pairs or groups, whereas in others I will require that you work alone. In all cases, **the work that you submit must be your own and in your own words.** Lab write-ups that contain substantially similarly-written or duplicated answers will be considered in violation of the university's academic integrity policy. Lab write-ups should be neatly presented and I will take presentation into account in grading labs.

Research project:

One specific goal of this course, in terms of our overall goals for the geology department, is to emphasize scientific or technical writing skills. There is one research project directed at addressing this goal. I will provide a separate hand-out on it. You should be prepared for it to have several intermediate deadlines along the way and you should also plan on writing one draft for critique and review and a final draft, due well before the end of the semester.

Midterms:

Midterms will cover material presented both in lecture and in lab. The format of questions will vary.

Techniques that we might cover in class	**Topics we might cover in class**

• Air photo interpretation
• Multispectral remote sensing
• Dating techniques for geomorphic processes
  o C 14
  o Be 10
  o Dendrochronology
  o Paleomag
  o He-Th?
  o OSL
  o Other cosmogenic nuclides?
• Use of experimental models for geomorphic processes
• Use of DEMs for quantitative/statistical characterizations of landscape
• GPS techniques
• Fission track and other evidence for surface uplift and exhumation (isotopes?)
• Morphometric analysis
• Experimentally modeling geomorphic processes
 	
Field techniques:
• Leveling
• Stream gaging
• Simple mapping
• Soil coring and logging
• Analysis of soils and unconsolidated sediment
• Stream gaging and bed sediment analysis
	• Forces and processes in geomorphology
	• The hydrologic cycle and watersheds
	• Coastal processes and landforms
	• Tectonics and geomorphology
	• Fluvial processes and landforms
	• Landscape evolution and human geomorphology
	• Climatic modification and sculpting of the earth's surface
	• Eolian processes and landforms
	• Weathering
	• Soils and geomorphology
	• Glacial processes and landforms
	• Mass movements
	• Karst processes and landforms
	• Applied geomorphology