GEOGRAPHY 140A

Physical Landscapes: Process and Form

UC Berkeley, Spring 2023

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GEOGRAPHY 140A (4 credits)

This document: syllabus140A2023.pdf

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Class Lectures: MW 2:10-3:30 in McCone 145 (or on Zoom if necessary)

+ Additional pre-requisite lectures must be viewed before Wednesday, January 25:
geomorph_SupplementBackground.mp4, and
supplementaryLectureRockTypes.mp4
+ If needed, make-up lectures, probably Mondays at 5:10 p.m., via Zoom

Regular Office Hours:
After lectures, weekly, either Mon. or Wed.
Which day depends on my obligations for faculty meetings and seminars.
Also by appointment if necessary.

Required Materials: Available as pdf documents in bcourses/Files
1. Parts of text: *Global Geomorphology*, M. Summerfield
2. Maps: *Landforms of the United States*, E. Raisz. *United States Topographic Map* (USGS)
3. Outline of lecture notes:
(Files/ section2_2023.pdf, section3_2023.pdf, section4_2023.pdf).

You should print a copy of these files and add notes to them each week. They are the only resource you will be allowed to use during the midterm and final exams, in addition to your own brains.

Many optional additional readings are available in the Earth Sciences Library in the basement of McCone Hall. I recommend:

Two informative books about geomorphological processes:
1. Ritter, Kochel and Miller: *Process Geomorphology* (3rd ed.)
2. Anderson and Anderson:
Geomorphology: The Mechanics and Chemistry of Landscapes

Two books about tectonics:
1. Kearey, Klepeis, and Vine: *Global Tectonics* (3rd ed).
2. Condie: *Plate Tectonics and Crustal Evolution* (4th ed)

Google and Google Earth are very useful, as are world atlases
(the Earth Sci. library has good ones). Use these resources proactively!

What is GEOGRAPHY 140A?
Physical Landscapes: Process and Form

This course concerns: the physical surface of the earth: its form, the processes that shape it, and its capacity for change.

The discipline is casually called "Geomorphology," a legacy term.
“Earth Surface Processes and Landforms” is a better descriptor.

Why you should be here and alert:

1. The earth's surface is our home. It is in our interest to be good tenants.
   → need to understand pathways for, and possible consequences of, change; need to understand natural disasters; paths to sustainability

2. Geography as the science of interactions:

   → geomorphology is an important facet of the people/environment interface
   → inextricable links to biology and climate

3. Geography as sense of place, a dimension analogous to historical time.

   → physical landscapes are unique and often beautiful, and people have to adapt to them. Can you separate Switzerland from the Alps or New Orleans from the bayous, river and delta?
   → You tour around a landscape (whether by air or ground). You see things. Why do you see what you see?

What constitutes explanation?

Although describing and cataloguing are important, and we will do some of this, we need to go beyond these and ask "why? "
→ Seek explanations in mechanisms, root causes, and historical contingencies

* Requires information from a host of disciplines (geology/chemistry/physics/biology), all of which are building blocks for physical geography.

Geomorphology is a crossroads.

Geomorphology sits within and between four disciplines in particular:

Geology
Geophysics — Civil Engineering (Hydrology + Slope stability)
Geography

Geomorphology also taught at Berkeley in the Earth and Planetary Science Department (EPS117). Both rely deeply on an understanding of **process**: this is at the core of answering the "why" questions, and questions of evolution over time (e.g., response to human activities, or climate change). The EPS course is much more about the actual practice of geomorphology. This geography course is a conceptual overview.

Also overlap with courses about water: esp. Prof. Larsen (Geography)

Geog 140A, outline of topics covered:

1. brief overview: the geomorphological machine
2. a quick look at essential ingredients
3. global tectonics and relation to landscapes: making relief
   A. Why there is plate tectonics and isostasy
   B. Plate boundary landscapes
   C. Plate interior landscapes
   D. Volcanism
4. river-hillslope systems: attacking and propagating relief
   A. river systems as conveyors of water
      - drainage networks
      - discharge hydrographs
      - channel hydraulics
   B. hillslopes
      - weathering and soils
      - transport vs. production limitation
      - hillslope transport processes
   C. river systems as conveyors of sediment
      - transport processes
      - magnitude-frequency concepts
      - mass conservation consequences
      - channel types
      - longitudinal profiles and terraces

Geog 140B (taught some fall semesters).
Coasts, deserts, karst, glacial and periglacial landscapes, and Physiography.

GEOGRAPHY 140A Grading

This standard scale will be used as a minimum:

99-100 A+, 94-98 A, 90-93 A-
87-89 B+, 84-86 B, 80-83 B-
77-79 C+, 74-76 C, 70-73 C-
67-69 D+, 64-66 D, 60-63 D-
< 60 F

I will curve scores if I think it fair. A curve can only help your grade: I will not bring grades below the standard scale.

TO EARN YOUR GRADE:

(1) First graded exercise: **20%**
(Made available to you on **Wednesday, February 22**.
Due at start of class on **Monday, February 27**)

(2) Mid-term exam (**Monday March 20**, in-class) **35%**

(3) Cumulative Final Exam **in final exam period** **45%**
(Tuesday May 9, 11:30 a.m.-2:30 p.m.)

I will provide more details about exams as their time approaches.
I will adjust the plan if the pandemic resurges and prevents in-class events.

☺ Exams are good. They are your opportunity to really learn the material. ☺

On exams, you are responsible only for material covered in lectures, except as specially noted. Other resources are to provide more illustrations and data, and a more complete and terminology-intensive presentation, for those interested.

Regular Announcements: I usually make announcements at the start of lecture. Announcements of major importance will also be sent via bcourses.

Statement of Remote- and Online-Course Ethics:

All course materials (recorded lectures, pdf files of lecture notes, pdf files of book chapters, etc.) are property of the professor or other copyright-holding entities. Students and other participants are not permitted to copy any materials, post them online, or use them in any form beyond the course other than personal educational activity.

To maintain security on Zoom, the meeting identification number and passcode must not be shared with anyone outside the class, and must never be posted online.

Statement of Ethics and Collaboration:

On the two exams, all work must be your own, and you are not permitted to communicate with other people during these events, except to ask me for clarification on questions. In all other respects, however, you should view the class as completely collaborative. You can all benefit by learning from one another and helping one another do the same. There is no reason everyone can't achieve a good grade.

Statement concerning identifying language:

If I use the wrong names or pronouns for anyone, please let me know and I will correct it.

Statement concerning times of need:

If any of you encounter serious difficulties (whether related to the pandemic or not) that hinder your engagement with the class, let me know and I will help to the extent feasible.

Statement concerning absences:

I never take attendance and attendance does not factor into your grade (except for exams, obviously). If you have to miss a lecture, it is your responsibility to get notes from a fellow student, review them, and then ask me clarifying questions. If the lecture was recorded, it is your responsibility to watch the recording and then ask me clarifying questions.