GEO 347 - CLIMATIC GEOMORPHOLOGY
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Course Objectives
Recent events (e.g., flooding, mudslides, sinkholes, tsunamis) highlight the impact of land forming processes on human societies and socioeconomic systems. With these and other events in mind, this course examines how land surface forming processes interrelate with climate and land use. The first part of the course focuses on the role of climate, vegetation, and other factors on landform changing processes. The latter part considers how these processes are expressed in different systems, including rivers, glaciated landscapes, permafrost, karst landscapes, and in coastal environments. Each system is examined in terms of recent and historical events, as well as potential for future events given trends in climate warming and land use.

Required Text

Prerequisite
GEO 101, GLY 104, or permission of instructor

Grading
Your final grade will be based exclusively on two non-cumulative in-class tests (20% each), a take-home final exam (20%), a short (2000 word or 8-page) essay on a topic provided (20%), an annotated bibliography on the topic you choose for your essay (10%), and class participation (10%). At least part of each in-class test will consist of some choice from a set of questions distributed up to one week in advance of the test. Make-up tests must be completed within four (4) working days, unless an acceptable excuse (e.g., illness, accident) with written proof (e.g., doctor’s note, police report) is provided. For make-up tests taken without a valid excuse the instructor will choose all questions.

Essays, annotated bibliographies, and take-home exams must be printed using a high quality printer (e.g., laser printer), double-spaced, with a 12 pt. font size. They must be submitted on the specific due date, either to the instructor in person or before 4:30 p.m. in the Department of Geography drop box just outside the main office. Late work will lose 10 percent (out of 100) per work day. Further guidelines on written work will be provided with the respective assignments.

What do letter grades mean? A “D” is a marginal understanding of some of the material. A “C” is a basic understanding of most of the material. A “B” indicates that you have obtained an understanding sufficient enough to summarize and use course skills adequately. Obtaining an A means you can also show originality, creativity, and ability to reason about the material and form linkages where they are not obvious.

Numerical grades in this class will be translated as follows:
A (88% or higher), A- (84 to 87.99%), B+ (80 to 83.99%), B (76 to 79.99%), B- (72 to 75.99%), C+ (68 to 71.99%), C (64 to 67.99%), C- (60 to 63.99%), D+ (56 to 59.99%), D (52 to 55.99%), F (less than 52%)
Office Hours
I’m available Mondays and Wednesday 11:00 a.m. to Noon, or by appointment, or whenever I’m in my office.

Course Topics

1) Geomorphic processes (Chapter 1). Equilibrium concepts; forces; thresholds and complex response; linkages

2) Internal and external forces (Chapter 2). Epeirogeny; orogeny; volcanism; climate change; sea-level change

3) Chemical weathering (Chapter 3). Decomposition processes and rates; mobility; rates of chemical weathering; pedogenesis

4) Physical weathering (Chapter 4). Processes; strength of materials; slope stability; slope development; hazards of slope failure

5) Drainage basins (Chapter 5). Soil water; infiltration; groundwater; runoff; stream flow and floods; erosion and sediment yield; nonpoint source pollution

6) Fluvial processes and forms (Chapters 6 and 7). Basic flow mechanics; sediment transport; hydraulic geometry; channel forms; dynamics; floodplains; fans and pediments; deltas

7) Glacial processes (Chapters 9 and 10). Glacial ice formation; mechanical properties of glaciers; structure of glacial ice; glacial erosion and deposition; load bearing strength and construction

8) Periglacial processes (Chapter 11). Permafrost; frost action; nivation; mass movements; engineering issues; potential impact of climate warming

9) Karst processes (Chapter 12). Rock resistance; driving forces; karst hydrology; caves; sinkholes

10) Coastal processes (Chapter 13). Wave generation; tsunamis; shoreline erosion; effects of sea level changes

Important milestones:
- January 31: Topics for essays handed out
- February 7: Potential test questions for Test #1 handed out
- February 11: Target date for you to sign up for an essay topic
- February 14: Test #1 – Covers Topics 1 to 4
- March 7: Annotated bibliographies are due no later than 4:30 p.m.
- March 14-18: Spring Break
- March 30: Potential test questions for Test #2 handed out
- April 6: Test #2 – Covers topics 5 to 7
- April 25: Essays due no later than 4:30 p.m.
- April 29: Take-home exam handed out
- May 6: Take-home exam due no later than 4:30 p.m.