

1-2013

GEO 228.01: Geosphere Surface Processes

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GEO228: Earth Surface Processes
 Spring 2013
 University of Montana
 Instructor: Marco Maneta
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 Office: CHCB 304
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 Class meetings: Tuesday-Thursday 10:10pm-11:00pm
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 Room: CHCP105

Overarching goals: In this course students will develop the skills to

- Understand the mechanisms that drive the processes that shape the surface of the Earth
- Apply technical knowledge to quantitatively describe these processes

Ancillary goals: Along with the overarching goals, in this course students will learn how to think of processes in geosciences in terms of the fundamental laws of physics and how to analyze them quantitatively. Students will learn that processes on Earth are bound by the conservation of physical quantities. In addition, students will improve their quantitative and computer skills, will learn how to present information in a graphical format and how to interpret graphs containing scientific information.

Prerequisites: GEO101/102

Office hours: Office hours will be the next hour after class.

Grades: 50% class activities and assignments - 50% exams.

Assignments:

Assignment 1: Units and dimensions

Assignment 2: Mass balance, residence time and equilibrium

Assignment 3: Analog and analytical modeling of isostatic balance

Assignment 4: Analog and numerical modeling of diffusion process in a hillslope

Assignment 5: Abstract of 2 geosciences colloquium talks

Course Content (tentative):

	Topics	Notes
Week 1	Thinking science Units and Dimensions	Assignment 1
Week 2	Tools of the trade: Systems, conservation, residence times, etc	Excel crash course
Week 3	Forcing mechanism of Earth Surface Processes: Radiation, gravity, internal heat	Assignment 2
Week 4	Gravitational field, potential energy, Shape and structure of the Earth	
Week 5 - 6	Generation of topography: Earth's internal energy, tectonics	Assignment 3
Week 6-7	Basics of radiation, Sun-Earth dynamics, Radiation imbalance as engine of the hydrologic cycle	
Week 8-9	Destruction of topography: Weathering, transport, deposition.	
Week 10-11	Diffusion processes: Concept and landforms	
Week 12-13	Modeling diffusion Hillslope dynamics	Assignment 4
Week 14-15	Watersheds and drainage networks	Assignment 5