

# GEOGRAPHY AND PLANNING

## GPHY 208: Surface Processes, Landforms, and Soils



<b>Contact Time</b>	Two 1.5 hour lectures, 3 practical hours per week (for 9 weeks)		
<b>Format</b>	Lectures, laboratory and practical assignments based on hands on labs, maps, remote sensing, and air photo analyses.		
<b>Class Assessment</b>	Quizzes	30%	2 Quizzes + 1 in class review
	Practical Assignments	40%	4 assignments Weeks 3-12
	Exam	30%	Final exam period

### COURSE OVERVIEW

Surface Processes, Landforms, and Soils involves the study of aspects of geomorphology, weathering processes, and soil formation (pedology). Geomorphology is the study of the materials, forces and processes that shape the earth's surface, and generate landforms. Earth surface materials (minerals and rocks) are derived at depth in the earth's crust, with structures resulting from tectonic activity, volcanism, or sedimentation/burial. Surface materials may then be broken down further and/or rearranged by weathering, gravity and fluid media driven by solar and gravitational energy. Pedology involves the study of the development, composition, and structure of soils, that result from the breakdown of rocks at the surface by weathering.

Students are introduced to the chemical and physical nature of the rocks and minerals that make up the earth's surface, and the variety of processes that govern the movement, deposition, shaping, and breakdown of these materials. The labs are designed to enhance the students' ability to characterize rocks, soils, and sediment, and identify landforms using aerial photographs and topographic maps, and to interpret and analyze the processes responsible for the different landforms. These assignments provide students an opportunity to enhance their technical, numerical, and writing skills; and require the use of spreadsheets, word processing and problem-solving skills.

### LEARNING OUTCOMES

- Discuss the relevance of geomorphology and pedology in the environmental earth sciences, climate, and planning.
- Understand and explain the processes that shape the earth's surface.
- Identify landforms, soils, and sediment structures and explain their likely genesis. Emphasis will be placed on weathering, soil forming processes, and tectonic, volcanic, mass wasting, glacial, and fluvial landforms, and processes.
- Use air photos, maps, and remote sensing imagery, to interpret and analyze earth surface features and their formation
- To highlight the importance of geomorphology and pedology in physical geography and environmental earth sciences

### COURSE TOPICS

- 1) Understanding geomorphic processes and systems concepts (feedback and equilibrium)
- 2) Chemical and physical weathering processes
- 3) Soil forming processes and soil orders of the Canadian Soil Classification System
- 4) Tectonic and volcanic processes and landforms
- 5) Mass wasting processes and landforms
- 6) Fluvial processes and landforms
- 7) Glacial processes and landforms

### COURSE READINGS

Course text: Trenhaile (2016), 6th Edition. Geomorphology, Oxford University Press, Toronto, 575p.  
The fifth and fourth editions of this text are also acceptable. *\*available on 3-hour loan from Stauffer.*