McGILL UNIVERSITY
DEPARTMENT OF GEOGRAPHY
GEOG 272: EARTH'S CHANGING SURFACE

Course Outline

A) COURSE INSTRUCTOR:

Wayne Pollard (Room BH 618)
Office hours – Wed 2:00-4:00
TA's - tba

B) COURSE DESCRIPTION

The **aim of this course** is to introduce the geomorphic and some geologic (tectonic) processes responsible for the formation of landforms and landscapes that comprise the Earth's surface. The crust of the Earth (the lithosphere) and particularly its surface, is an extremely dynamic environment where forces driven by internal and external sources of energy interact to the Earth interact to 'build up' and 'tear down' its structure. It follows therefore, that terrain features and landscapes existing at any time in the Earth's history, or at any place on the Earth's surface, reflect a dynamic balance between the various forces at work. This is the fundamental thesis or "paradigm" of process geomorphology. This dynamic balance is complicated by a number of factors, for example; the intensity of forces and processes is highly variable over time, hence many landscapes are in a state of change or flux when investigated. Accordingly, landforms of one geomorphic regime may merge or overlap with landforms of the next. The landforms or terrain features we observe on the Earth today may be either a function of modern processes or a relic of a previous environment. This is clearly illustrated by the widespread occurrence of glacial landforms in parts of southern Quebec and Ontario which reflect the glacial conditions that existed maybe 20,000 years ago, or more.

This course will discuss at an introductory level the nature and origin of the dynamic forces, geomorphic processes and resultant landforms that currently characterise the Earth's surface. The effects of tectonic activity, gravity, running water, waves, ice, wind and cold temperatures will be discussed within a geomorphic and geologic framework. We will adopt the "process" geomorphology approach that focuses upon the dynamic elements of geomorphological, hydrological, geological and ecological systems. Examples will be drawn from different physiographic and climatic settings; however, the emphasis will be placed on the Canadian context.

Students are reminded that Physical Geography and Geomorphology are physical sciences and some of the material in this course draws upon basic science theory and relationships. From time to time simple numerical relationships will be introduced and explained in class and in handouts. You may be expected to solve simple problems on the midterm and final exams using these relationships, you will also be expected to try to understand and relate these relationships in a general sense to the processes they quantify. The subject of Geography is taught in both the Faculty of Arts and the Faculty of Science but in either case it should be remembered that it is always a quantitative science.

C) LECTURES and IMPORTANT DATES

Lectures are Monday, Wednesday and Friday from 11:30 to 12:30 hrs in MacDonald Engineering Rm 279. Fall term runs from Sept 5 to Dec 5, as the semester progresses lectures and supplementary material will be put on WebCT.

D) EXERCISES

Currently five or six practical exercises involving topographic maps (1/50,000 & 1/250,000 scale) and map interpretation are planned for this course. However, there is no formal lab period scheduled so these exercises will be introduced in class and completed outside of class time. Large-scale topographic maps provide a general picture of landscape relationships and landforms, and are therefore a useful tool in geomorphic studies. Map reading is an essential skill for all geographers and field scientists.
PLEASE NOTE: *Deadlines are not flexible and will be strictly enforced!*

E) EVALUATION

Midterm Exam - (Monday Oct 16)	30%
Practical Exercises (5-6 exercises)	30%
Final Exam (during exam period)	40%

Please realise that departments have no control over the scheduling of final examinations and that individual professors do not have the authority to allow students to write the final exam outside the designated time slot - **so please don't ask**. Furthermore, there will be no opportunity to "**re-do**" or "**make-up**" missed or failed assignments and midterms. Additional work to improve a grade is not an option. If you miss the midterm or fail to submit an assignment without a doctor's certificate a mark of "0" will be awarded

F) COURSE PACK

Instead of a required text a course pack has been prepared that draws on material from the lectures and from the literature. The course pack also includes supplementary material on map reading, guidelines for exercises reports, midterm and final formats, and copies of previous exercises.

G) REFERENCE TEXTS

(1) **Global Geomorphology** by Michael Summerfield. Longman Scientific and Technical, London (1991).
(2) **Physical Geography:** Science and systems of the Human Environment by A. Strahler and A. Strahler, John Wiley and Sons (1997)
(3) **Process Geomorphology**: (3rd or 4th edition) by D. Ritter, R., Kochel and J. Miller. WC Brown Publishers (1995 or 2001)

H) Academic Integrity

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary procedures (see www.mcgill.ca/integrety for more information)

I) LECTURE TOPICS

Topic	Number of lectures
• Introduction and course outline	(1)
- Course objectives	
• Basic concepts and background	(3)
- What is Geomorphology?	
- Historical foundations	
- Scientific paradigms	
- Systems approach	
- Process Geomorphology	
• Maps	
- Map Reading and topographic maps	(3)
• Geologic framework and tectonics	(3)
- Continental drift	
- Structural landforms	
• Weathering and erosion	(3)
• Physical properties	(2)
• Slope form and process	(2)
• Basin and hill slope hydrology	(3)
- Runoff	
- Surface and subsurface flow	
- Groundwater hydrology	
• Fluvial systems	(4)
- Stream flow	
- Stream channels	
- Fluvial landforms	
• Coastal Systems	(3)
- Waves	
- Refraction	
• Glacial systems – Past and Present	(4)
- Pleistocene glaciations	
- Current glacial activity	
- Glacial processes and landforms	
• Permafrost and periglacial systems	(2)
- Distribution	
- Freezing and thawing	
- Landforms	
• Global Change (time permitting)	(2)
- Landscape responses to a changing climate	

This course is designed to compliment other introductory physical geography, geology (EPS) and environmental (MSE and A&O) courses. Certain important and "fundamental" topics are the domain of all of these courses and will probably be repeated.