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

COURSE OUTLINE

A) COURSE INSTRUCTOR:

Wayne Pollard (Room BH 618)
Office hours – Thurs 1:00-2:00
Teaching Assistants –Fanny Amyot + tba
Course email 272earthschangingsurface@gmail.com (direct **all course correspondence** to this email address, **do not** send messages to the personal email address of the prof or ta's)

B) COURSE DESCRIPTION

The **aim of this course** is to introduce and discuss the **geomorphic** and **geophysical** (tectonic) **processes** responsible for the formation of l**andforms** and **landscapes** that make up 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 'build up' and 'tear down' its structure. 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 constructive and destructive 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/processes is highly variable over time, and hence many landscapes are in a state of change or flux when investigated. Landforms from one geomorphic regime may merge or overlap with landforms of the next. The landforms we observe on the Earth today may be 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 more than 20,000 years ago.

This course will discuss at an introductory level the nature and origin of the forces, geomorphic processes and resultant landforms that currently characterise 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 a **"process" geomorphology** approach that focuses upon the dynamic elements of geomorphological, hydrological, geological and ecological systems. Examples will be drawn from a range of physiographic and climatic settings but with an emphasis 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 empirical 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 from 10:05 pm to 11:25pm in the Redpath Museum Auditorium. The term runs from Sept 3 to Dec 3; 25-26 lectures are planned; all lectures (ppt presentations) and supplementary materials will be posted on **myCourses**. Updated lectures (version used in class) may be posted following the lecture in which the material is discussed. This course includes a **midterm test** which will be held during the week of Oct 14 with the final time and date still to be determined (time slots for midterms are determined by the university based on room availability and may therefore be in the evening). A formal **final exam** will be during the final exam period in December, also scheduled by the University.

D) EXERCISES

Five practical exercises involving topographic maps (1/50,000 & 1/250,000 scale) and map interpretation are planned for this course. Since there is no formal lab period scheduled these exercises will be introduced in class and completed outside of class time. 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 - (October 15**)	30%
Final Exam - (Dec final exam period)	40%
Practical Exercises (5 exercises)	30%

There will be **no** opportunity to "**re-do**" or "**make-up**" failed assignments or the midterm. Additional work to improve a grade is not an option. If you miss the midterm test or fail to submit an assignment without the appropriate doctor's explanation a grade of "0" will be assigned.
** Due to shortage of suitable rooms during class time the midterm test may be held in the evening…the time and location will be confirmed as soon as possible)

F) COURSE MATERIALS

There is no required text or course pack, all of the necessary course material will be posted on **myCourses**. These materials will include lectures, exercises, supplementary material on map reading, guidelines for exercises reports, midterm and final formats, and examples of previous exercises. If you feel the need for a text or if you are planning to continue in the area of physical geography or geomorphology then any of the 3 reference texts (which are readily available used) listed below will prove helpful.

G) REFERENCE TEXTS (Reserve)

(1) **Global Geomorphology** by M. 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 (any edition)
(3) **Process Geomorphology**: (any edition) by D. Ritter, R. Kochel and J. Miller. WC Brown Pub (2011)

H) LECTURE TOPICS and SCHEDULE

Topic	***Lecture number***
• Introduction and course outline	(1)
- Course objectives	
• Basic concepts and background	(2& 3)
- What is Geomorphology?	
- Historical foundations	
- Scientific paradigms	
- Systems approach	
- Process Geomorphology	
• Introduction to Map reading	(4)
- Exercise 1	
• Geologic framework and tectonics	(5-6)
- Continental drift	
- Structural landforms	
• Map Reading and topographic maps	(7-8)
- Exercise 2	

- Weathering and erosion (9 - 10)
- Physical properties (11)
- Slope form and process (11 – 12)
- Basin and hill slope hydrology (13)
    - Runoff
    - Surface and subsurface flow
    - Groundwater hydrology
- Fluvial systems (14 & 15)
    - Stream flow
    - Stream channels
    - Fluvial landforms
    - Exercise 3
- Coastal Systems (16, 17 & 18)
    - Waves
    - Coastal landforms
    - Exercise 4
- Glacial systems – Past and Present (18, 19, 20, 21)
    - Pleistocene glaciations
    - Current glacial activity
    - Glacial processes and landforms
    - Exercise 5
- Permafrost and periglacial systems (22, 23, 24)
    - Distribution
    - Freezing and thawing
    - Landforms
- Global Change (time permitting) (25)

Note: This course is designed to complement other introductory physical geography, geology (EPSC) and environmental (MSE and AOS) courses. Certain important and "fundamental" topics are the domain of all of these courses and will probably be repeated, however the context will vary from one course to the next.

I) McGILL POLICY

Please Note: Policies governing academic issues which affect students can be found in the Handbook on Student Rights and Responsibilities, Charter of Students' Rights (which can be found online at http://www.mcgill.ca/files/secretariat/greenbookenglish.pdf) . **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/integrity/ for more information)." "In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded." **Student Support:** If you have a disability, please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 398- 6009 (online at http:www.mcgill.ca/osd) before you do this.

J) OTHER

Course Communication: Communication to students will often be via email through MyCourses. Students are encouraged to check myCourses regularly for course updates. While students can set-up forwarding of myCourses emails to personal accounts, they are strongly encouraged to forward this mail only to their official McGill email account (not hotmail, yahoo, …). The university and instructor cannot guarantee that course emails will be successfully forwarded to external email accounts.

Requests for reassessments must be made in writing within 10 working days of the date of return of the graded materials. Reassessments should normally be completed within 20 working days of the request. Grades may be lowered, raised, or remain the same as a result of the reassessment. The grade obtained on the reassessment takes precedence over the original grade. The course instructor will make the final decision concerning a grade change.