PRELIMINARY COURSE OUTLINE
GEOG 305: Soils and Environment
Fall term, 2021

INSTRUCTOR:

Prof. Christian von Sperber chris.vonsperber@mcgill.ca
Office hours: by appointment

CLASS TIME:

On Tuesdays and Thursdays from 10:05 to 11:25 pm.

COURSE DESCRIPTION:

Soil means different things to different people and thus studies of soils are very varied. Issues of soil science include the conservation of soils against erosion, the managing soil fertility, particularly in soils of low natural fertility, areas subject to salinization and desertification and of finding ways to store carbon in soil organic matter, to slow the rate of increase of atmospheric carbon dioxide and global warming. Thus, soils play an important role in many disciplines, but one of the problems that has arisen is that the study of soil has developed primarily to serve these disciplines, often without much exchange of information. The pedological approach to soils regards the soil as a complex biological, chemical and physical system, whose processes and properties are both influenced by, and in turn affect, the environment. Fluxes of energy, water, nutrients, organic matter and gases pass through the soil: the fluxes control the soil properties and their development and the soil, in turn, affects the overall environment.

This course aims to give students a basic understanding of the properties of soils, the distribution and characteristics of major soil groups, their limitation for different land uses and the impact of environmental change on soils. The course is designed to accommodate geographers, MSE students, geologists, ecologists and the like. There are no set prerequisites to the course, apart from Environmental Systems (GEOG 203) or an equivalent. The learning outcome of the course is to be able to understand the physical, chemical and biological properties of soils and their role in the environment. The objectives will be achieved through a series of lectures (Tuesdays and Thursdays 10:05 – 11:25 h, starting September 2), assignments and interactive group discussions. There is no strongly recommended text. PowerPoint lecture slides, as a pdf, will be available on *myCourse*s before each class and access to journal articles will also be located on *myCourses.*

COURSE EVALUATION:

Evaluation of the course will be based on a mid-term test (30%) which will be a 48 hour take-home test, completion of assignments (30%), active class participation (10%) and a final exam (30%).

LECTURE TOPICS:

1. Concepts of soil: soils and environmental processes.
2. The physical, chemical and biological properties of soils.
3. Soils as dynamic systems: changes in soil water, air, nutrients and structure.
4. Plants and soils: concepts of nutrient availability and its measurement.
5. Soil hydrology
6. Weathering of soils.
7. Soil formation: concepts and application.
8. Global soils - distribution, properties, genesis and utilization.
9. Soil classification and land capability assessment. Soil quality and degradation.
10. Global change: soils as sources and sinks of greenhouse gases, the effect of climate change, carbon sequestration and managing 'smart' soils.

Please Note: Policies governing academic issues which affect students can be found in the Handbook on Student Rights and Responsibilities, Charter of Students' Rights (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.

Course Communication: Communication to students will often be via email on 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 or yahoo). The university and instructor cannot guarantee that course emails will be successfully forwarded to external email accounts.

Please read the note on the Departmental rules regarding re-grades:
https://www.mcgill.ca/geography/files/geography/geog_student_assessment_policy_0.pdf

Mutual respect is expected at all times amongst instructors, teaching assistants, support staff and students at McGill University. Students are referred to the Handbook of Student Rights and Responsibilities (the 'Green Book') for McGill's policies on Code of Conduct and to www.mcgill.ca/dp-cio/epolicies for McGill's E-policies.

© Instructor generated course materials (e.g. handouts, notes, summaries, online teaching materials, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. This includes submitting any materials to commercial websites posting course contents. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.