

GEOG 305: Soils and 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 properties of and processes in soils and their role in the environment and to be able to apply this knowledge and to predict the performance of soils in different settings. The objectives will be achieved through a mixture of lectures (Wed. and Fri. 8.35 – 9.55 h, BH426, starting Wednesday Sept. 6), a one-day field trip (Sunday Sept. 24) to Mont St. Hilaire to describe and collect soils and a 6-week session of laboratory analyses of soils (BH 615, at times to be decided later).

Evaluation of the course will be based on a mid-term test (30%), a final examination (30%), the laboratory analyses (10%) and a term paper (30%) which draws on the information collected on the field trip and the laboratory analyses of the soils collected. The latter is based on a group effort, so co-operation in field data collection, laboratory analyses and result collation makes life easier later.

There is no strongly recommended text. PowerPoint lecture slides, as a pdf, and a synopsis of the lectures, will be available on *myCourses* before each class and access to journal articles will also be located on *myCourses*. Printed material for the field trip and the Laboratory Manual will be distributed. A Teaching Assistant will be available to help with the field-work and laboratory analyses.

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. Soils and organic farming
6. Weathering in soils.
7. Soil formation: concepts and application.
8. Global soils - distribution, properties, genesis and utilization: the polar, boreal and temperate regions; hydromorphic soils (gleysols and peats); the temperate grasslands and deserts; the tropics.
9. Soil classification and land capability assessment. Soil quality and degradation & the 'value' of soils.
10. Global change: soils as sources and sinks of greenhouse gases, the effect of climate change, carbon sequestration and managing 'smart' soils.

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 <<http://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.

For information on university and department policies for student assessment, please go to <http://www.mcgill.ca/geography/studentassessment>

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

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 514-398-6009 (<http://www.mcgill.ca/osd/>) before you do this.

Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights ([here](#)).