

McGill University
Department of Geography
GEOG-203: ENVIRONMENTAL SYSTEMS - COURSE OUTLINE 2006

This course presents a systems approach to the study of the temporal and spatial variability of the environment near the earth's surface. Emphasis will be put on understanding the processes of mass and energy exchange that drive the variability in earth's climate, water cycle, soil development, biogeochemical cycles, plant production and distribution of plant communities. The knowledge gained will be used to shed light on some environmental processes of increasing interest, such as global warming feedback mechanisms involving the water cycle and vegetation, the impacts of deforestation and acid precipitation on water and nutrient cycles, soil erosion and eutrophication of aquatic systems. There will be 3, one-hour lectures per week, Mon., Wed., Fri., 12:30-13:30.

The 37 lecture and 2 midterm exam sequence is divided into 3 sections, covering important interactions among the atmosphere, hydrosphere, lithosphere and biosphere, with a focus on interactions at the drainage basin scale. The three instructors approach the course topics within a common, integrated Earth Surface Systems viewpoint.

SECTION 1: EARTH SURFACE CLIMATOLOGY AND DRAINAGE BASIN HYDROLOGY

Instructor: **Dr. Michel Lapointe** (BH 619, michel.lapointe@mcgill.ca).

13 Lectures: Sept. 6 – Oct. 4, one assignment handed out sept 20, due sept 29. Midterm Exam 1 on Oct. 6
Patterns of solar radiation on the earth's surface. Land surface energy budgets and resultant global circulation. The global water cycle. Hydrological processes at the scale of the drainage basin: precipitation, soil water, evapotranspiration and runoff, groundwater. Effects of changes in land use such as urbanisation and deforestation on the water cycle.

SECTION 2: SOIL FORMATION AND EROSION AND BIOGEOCHEMICAL CYCLING IN DRAINAGE BASINS

Instructor: **Ms. Julie Turgeon** (BH318, julie.turgeon@mcgill.ca)

12 Lectures: Oct. 10 – Nov. 3, assignment for this section distributed Oct 11 and due Nov 1 and Exam 2: Nov. 8
An examination of the processes and controls on soil formation, the important soil properties and the consequences of soil erosion. Discussion of the cycling of nutrients and elements between the atmosphere, the biosphere and the hydrosphere. The effects of anthropogenic disturbances such as forest removal and acid precipitation on biogeochemical cycles and system recovery.
PowerPoint slides available at <http://www.geog.mcgill.ca/grad/turgeon/203.htm>

SECTION 3: BIOGEOGRAPHY

Instructor: **Dr. Gail Chmura** (BH 628, gail.chmura@mcgill.ca)

11 Lectures: Nov. 6 – Dec. 4, assignment for this section distributed Nov 8 and due Nov 22, requires self-guided field trip to the Montreal Botanical Garden.

You will be examined on this material in the final exam

This is an introduction to ecological biogeography covering: distribution of world's biota and environmental controls with an emphasis on vegetation disturbance and succession as well as energy and carbon flow in the environment, particularly as they relate to global warming.

Course Evaluation

3 Assignments, one per section, Due Sep29, Nov1, Nov22	10% each	30%
2 Midterm Exams (sect. 1: Oct6 ; sect. 2: Nov8),	15% each	30%
1 Final Exam (during exam period)		40%

The two **term exams** will be administered in class during regular lecture periods, at the end of sections 1 and 2, respectively. The **final exam** will be held during the formal exam period in December with a set by the University later in the term. The final will cover the whole course, with 60% of exam weight on section 3 and 20% on each of sections 1 and 2 (these two sections have been the subject of mid-term tests).

Supplemental and deferred examinations: these are administered in Spring 2007, are worth 40% of the course grade and cover the whole course content, with 60% given to section 3.

READINGS

Available at the McGill Bookstore. Copies of the books are on reserve at the Schulich Library.

Required reading

- Text: Strahler, A. and Strahler, A. 2005. *Physical Geography, 3rd edition, Canadian Version*. Wiley, 650 pp. There will be required readings from this book.. Students have told us they find a comprehensive text such as this to be a useful reference, particularly in upper level Geography courses.
- Course Pack: GEOG-203 *Environmental Systems* (approx. \$20).

Recommended

Northey and Knight (various publication years) *Making Sense: a Student Guide to Research and Writing*, Oxford Press. This book will be useful throughout your university career. It provides guidance in using the university library, writing essays, and doing research (such as will be required in your third assignment). Sections on preparation of reports and presentations will be useful in your upper level courses.

OTHER REQUIREMENTS

One of your assignments will require that you visit the Montreal Botanical Gardens (<http://www2.ville.montreal.qc.ca/jardin/en/propos/propos.htm>), easily accessible by the metro. Student admission is ~\$9.00.

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).

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 before you do this.

Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights (Chapter One of the Student Rights and Responsibilities Handbook available as a PDF on www.mcgill.ca/secretariat/documents/).

Class Etiquette

Out of common courtesy, your professors request a few things of you. While students are in class, they are expected to give their full attention to the professor or the videotape, if one is being shown. Reading, talking, sleeping, and leaving before the end of class are impolite. If you know before class that you will have to leave early sit towards the back near the door so as not to disrupt the class. Likewise, if you arrive late, please enter from the back of the class.