

ATOC/EPSC/GEOG 104
Leacock 26
1:05 – 2:25 Tuesdays and Thursdays

The Earth System 2009
Course Outline

Earth can be viewed as a dynamic interacting system of atmosphere, life, ocean, rock and soil. Earth is open energetically but largely closed materially. Earth's surface and interior have changed through time and continue to change today. Understanding these changes and what drives them is the goal of Earth system science. This course will introduce the core processes of the 'Earth System' and apply them to the 21st Century global challenges posed by climate change, which is occurring at the same time as increasing stresses on services provided by natural ecosystems due to human population growth and resource utilization.

Professors:

Jessica K. Cox Burnside Hall, Room 843

Office hours: by appointment

Michel F. Lapointe Burnside Hall, Room 619

Office hours: Tuesdays and Thursdays 4-5pm or by appointment

William G. Minarik Frank Dawson Adams Building, Room 215

Course Coordinator (the person to contact with respect to course administration)

Office hours: after class on Tuesdays (2:30-3:30) or email on *myCourses* for an appointment

Teaching Assistants: (can be emailed through *myCourses*)

Stephanie Palmer (EPSC), Trudy McCormack (ATOC), Britta Ricker (GEOG)

Course Topics:

<i>No.</i>	<i>Date</i>	<i>Lecturer</i>	<i>Subject</i>
1.	6-Jan	all three	Introduction
2.	8-Jan	(WGM)	Solar System/Earth Materials
3.	13-Jan	(WGM)	Plate Tectonics
4.	15-Jan	(WGM)	Reservoirs and Resources
5.	20-Jan	(JKC)	Energy and the Atmosphere
6.	22-Jan	(JKC)	Atmospheric and Oceanic Circulations
7.	27-Jan	(JKC)	Weather and Climate
8.	29-Jan	(JKC)	Natural Atmospheric Variability and Extremes
9.	3-Feb	(MFL)	Introduction to Hydrology, soils and their productivity
10.	5-Feb	(MFL)	Introduction to Biomes, ecology and ecosystems
11.	10-Feb	(MFL)	Global population growth
12.	12-Feb	(MFL)	Intro to Ecosystem Resilience and catastrophic regime shifts
	17-Feb		MIDTERM 1
13.	19-Feb	(WGM)	Deep Time/Earth history
	24-Feb		Winter Break
	26-Feb		Winter Break

<i>No.</i>	<i>Date</i>	<i>Lecturer</i>	<i>Subject</i>
14.	3-Mar	(WGM)	Snowball Earth (evolution of atmosphere)
15.	5-Mar	(WGM)	Himalayas, weathering & Pleistocene glaciation (geological CO ₂ cycle)
16.	10-Mar	(JKC)	Natural Climate Forcings & Paleoclimate
17.	12-Mar	(JKC)	Global & Regional Climate Change
<i>Two lectures on climate change, population growth and pressures on food and water resources:</i>			
18.	17-Mar	(MFL)	Regional case study 1: The Sahel and the subtropics
19.	19-Mar	(MFL)	Regional case study 2: The U. S. Southwest and the Canadian Prairies
20.	24-Mar	(JKC)	Climate and Civilization
	26-Mar		MIDTERM 2
21.	31-Mar	(WGM)	Geologic hazards
22.	2-Apr	(MFL)	Coastal vulnerability to sea level rises
23.	7-Apr	(WGM)	Energy alternatives
24.	9-Apr	all three	Climate change mitigation and adaptation: an overview
	14-Apr		NO CLASS (Friday classes held)

There is no textbook, but a Course Pack (available at Bookstore) contains the required readings for most of the course. Some additional required readings on topical subjects will be announced in class and posted on *myCourse* (see below).

This is not a Web-based course: accessing complete course content requires lecture attendance. Exam questions will be based on the readings and also on unique material presented in lecture. You are encouraged to ask questions during class!

Marking: 30% assignments, 30% best score of the two midterm exams, 40 % Final Exam

There will be 4 assignments throughout the course, two midterm exams, and a comprehensive final exam. The highest score of the two midterms will be used to determine that 30% of your final mark.

Late assignments are given a penalty of 10% per day, which can be waived only on delivery to the course coordinator, Prof Minarik, of a dated doctor's note.

myCourses (WebCT Vista)

myCourses will be used extensively through the course. *myCourses* has unique e-mail addresses for the professors, teaching assistants, and students in the course, as well as a Group Discussion section; this is the second best place (the first is in class) to ask questions on the course material. We will also be posting additional readings, links to Earth Systems web sites, lecture material, and study guides on *myCourses*. Check *myCourses* frequently for course announcements.

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).