

**LAKEHEAD UNIVERSITY – ORILLIA CAMPUS
DEPARTMENT OF GEOGRAPHY AND THE ENVIRONMENT
GEOG 4351 FAO – GLOBAL CLIMATE CHANGE 2015**

Course Outline

A) COURSE INSTRUCTOR:

Florin Pendea (OA, Room 3026)
Office hours – TBA or by appointment

B) COURSE DESCRIPTION

This course aims to help students develop an understanding of the natural climate forcing, natural variability and feedbacks in the climate system. We will discuss the role of Earth's major systems - the atmosphere, oceans, lithosphere, and living organisms— in defining the global climate across various timescales and, more importantly, the interactions among them. Those interactions are crucial to shaping Earth's climate and hold the key to predicting future climate shifts and understanding the role that humans might play. To this end we will be studying the Earth's environmental history focusing on the last two million years (Quaternary Era). Also, students will develop a clear understanding of climate research methodology and its limitations.

C) PREREQUISITES

GEOG 2331 and GEOG 3331; or permission of the Instructor.

D) STUDENT LEARNING OUTCOME

At the end of semester students will be able to:

1. **Explain** how the Earth's climate system has changed over various time scales;
2. **Identify and critically discuss** the conceptual, empirical, and methodological approaches used in the study of climate history (paleoclimatology);
3. **Apply** the General System Theory and interdisciplinary approaches to identify and characterize climate change;
4. **Analyze and critique** ways in which climate change can be detected in observational material and modelling scenarios and the ways in which modelling tools can be used to research climate change.

E) IMPORTANT DATES

Lectures are Tuesday and Thursday from 14:30 to 16:00 hrs in OA Room 2019. Fall term runs from September 14 to December 7; as the semester progresses lectures in PPT format, lecture notes, assigned readings, and supplementary material will be put on D2L.

F) ASSIGNMENTS

There will be one assignment worth 30% and this is due on **November 15**.

G) EVALUATION

Midterm Exam	30%
Assignment	30%
Final Exam	40%

The midterm test and final exam will include multiple choice and “short answer” questions as well as hand-written essays. The "short answer" questions may require one or two paragraph answers. The essays should normally be 1-2 pages long. Typically, up to 1/3 short-answer questions come from reading material not covered in lectures. Definitions make up 10-15 percent of the exams. One-third of the final exam will be comprehensive (i.e., from the entire semester's material).

Please realise that departments have no control over the scheduling of final examinations and that individual professors do not have the authority to allow students to write the final exam outside the designated time slot. Furthermore, there will be no opportunity to "re-do" or "make-up" missed or failed assignments and midterms. Additional work to improve a grade is not an option. If you miss the midterm or fail to submit an assignment without a doctor's certificate a mark of "0" will be awarded. Students with disabilities, however, can arrange to write the exam in a special setting. Please contact Student Affairs for more information.

H) REFERENCE TEXTS

Since no single textbook satisfy our needs I have compiled a reading list for each major topic and this will be handed out progressively throughout the semester. Some of the assigned readings will be available on D2L others can be accessed through Lakehead University Library Catalogue. Students are expected to complete the readings **BEFORE class** unless otherwise indicated.

I) LECTURE TOPICS¹

- **Introduction - The climate system. Course outline**
- **Topic 1. The age of the Earth – an overview of the geologic time and the critical climate events in Earth’s history**
- **Topic 2. Ice Ages (I)– The terrestrial evidence**
- **Topic 3. Ice Ages (II) – The evidence in the sea and ice**
- **Topic 4. Ice Ages (III) Causes of Quaternary glaciations**

¹ Topics timing along the semester may vary depending on how class discussions develop.

- **Topic 5. The Ice Age Aftermath** - The Meltdown – a story about lakes and forests
- **Topic 6. Rapid Climate Change – The Younger Dryas**
- **Topic 7. Slow climate change – The Holocene Climatic Optimum**

Time permitting:

- **Topic 8. Methods in climate change research**
 - Dating techniques
 - Proxy methods of tracking climate change

J) Academic Integrity

Lakehead University values academic integrity. All students must understand the meaning and consequences of cheating, plagiarism and other academic offences. Please refer to *Lakehead University Regulations: Academic Dishonesty* <http://vpacademic.lakeheadu.ca/?display=page&pageid=46> for more information.

K) 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. 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.

This course is designed to compliment other geography, geology and environmental courses. Certain important and "fundamental" topics are the domain of all of these courses and will probably be repeated.