

EARTH 105
CLIMATE CATASTROPHES IN EARTH HISTORY
SPRING QUARTER, 2009

Course Description

The objective of this course is to introduce students to the fundamental components of the Earth system—the atmosphere, biosphere, hydrosphere and solid Earth—and more importantly, examine how these components interact in response to internal and external influences to control climate. Within this Earth systems context, we will explore how climate is changing today, how it has changed (sometimes catastrophically) in the geologic past, and how it may change in the future. The course will consist of three, one-hour lectures and one discussion session per week.

Instructor

Matthew Hurtgen (Locy 315)
Office Hours - by appointment
Phone - 491.7539
m-hurtgen@northwestern.edu

Textbook

The Earth System
Kump, Kasting, Crane, 2004, 2nd Edition

+ additional assigned readings
from popular science journals
(i.e., Scientific American)

Evaluation

- | | | |
|-----------------------|----------------|--------|
| • Lectures | Hour exams (3) | (100%) |
| • Discussion sessions | | |

Lecture and Exam Schedule

Date	Topic	Reading
3/30	Introduction to Global Change	Chapter 1
4/1	The Systems Approach to Earth Science	Chapter 2
4/3	Global Energy Balance: The Greenhouse Effect	Chapter 3

4/6	Global Energy Balance (continued)	Chapter 3
4/8	Atmospheric Circulation	Chapter 4
4/10	Ocean Circulation	Chapter 5
4/13	Solid Earth Circulation (Plate Tectonics)	Chapter 7
4/15	Plate Tectonics (continued)	Chapter 7
4/17	Exam 1	
4/20	The Cycling of Elements (Carbon Cycle)	Chapter 8
4/22	The Carbon Cycle (continued)	Chapter 8
4/24	Long-Term Climate Regulation	Chapter 12
4/27	Evolution of the Atmosphere	Chapter 11
4/29	The Neoproterozoic Snowball Earth	
5/1	The Snowball Earth (continued)	
5/4	The Snowball Earth (continued)	
5/6	Pleistocene Glaciations	Chapter 14
5/8	Exam 2	
5/11	Pleistocene Glaciations	Chapter 14
5/13	Short-Term Climate Variability	Chapter 15
5/15	K/T Extinction Event	
5/18	K/T Extinction Event	
5/20	End Permian Mass Extinction	
5/22	End Permian Mass Extinction	
5/25	Memorial Day, No Class	
5/27	Paleocene-Eocene Thermal Maximum	
5/29	Exam 3	