

**Course:** *CIV\_ENV 201, Earth: A Habitable Planet*

**Credits:** 1 Unit credit; contact hours: 160 min lecture, 50 min discussion/activity

**Instructor:** Thea Wilson

**Text:** *The Earth System*, 2009, 3<sup>rd</sup> Edition by L.R. Kump, J.F. Kasting, R.G. Crane

**Other Mat'l:** *Consider a Spherical Cow: A Course in Environmental Problem Solving*, 1988 by John Harte

Readings from the scientific literature

**Description:** This course presents a broad description of Earth system science (i.e. the interaction between the atmosphere, hydrosphere, biosphere, and geosphere) focused on the physical, chemical, and biological processes that have made Earth habitable. The coevolution of Earth and life will be explored, examining how Earth system components respond to perturbations and how these relate to times of global change.

**Prerequisite:** CHEM 103 or CHEM 172

**Required?:** Required

- Goals:**
- 1) Describe the bio-geo-physico-chemical processes that maintain the Earth in a homeostatic and dynamic state
  - 2) Apply a scientific approach to the investigation of events in daily life
  - 3) Analyze a specific environmental situation within a larger context
  - 4) Assess how current and future human activities may affect the Earth system
  - 5) Discover and examine the scientific peer-reviewed literature

- Outcomes:**
- a) An ability to apply knowledge of mathematics, science, and engineering
  - g) An ability to communicate effectively
  - h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
  - i) A recognition of the need for, and an ability to engage in life-long learning
  - j) A knowledge of contemporary issues

**Relation of “course specific goals” to programmatic student learning outcome through Course Assessment Table (CAT), which feeds into Program Assessment Table (PAT)**

Course Goals	Outcomes	Performance Indicator	Assessment	Proposed Action
2	a	HW1-2, P1	73/100	
3	a	HW4, P4	77/100	
5	g	HW3, P1	96/80	
1	g	Q5, writing mechanics	63/80	
1	h	Q5, scientific content	63/80	
4	j	HW3, P2	92/77	

**Topics Covered:**

Wk	Date	Topic	Reading	Quiz/Due
1	29-March	Introduction, Global Change	Ch. 1	
	30-March	Science Librarian: How to search the literature	HW1	
	31-March	Daisyworld: Systems Approach to Earth Science	Ch. 2	
2	5-April	Global Energy Balance (Earth Climate)	Ch. 3	Q1
	6-April	Daisyworld Simulations		
	7-April	Atmospheric Composition and Structure	Ch. 3	
3	12-April	Atmospheric Circulation	Ch. 4	Q2 HW1
	13-April	Drifter Experiment Preparation		
	14-April	Ocean Circulation: Winds and Surface Currents	Ch. 5, HW2	
4	19-April	Ocean Circulation: Deep Ocean	Ch. 5	Q3
	20-April	Lake Michigan Drifter Experiment		
	21-April	The Cryosphere	Ch. 6	
5	26-April	Solid Earth Circulation (Plate Tectonics)	Ch. 7	Q4 HW2
	27-April	Stable Isotope Geochemistry Laboratory Tour		
	28-April	Plate Tectonics Continued	HW3	
6	3-May	The Carbon Cycle	Ch. 8	Q5  FP Topic (5/6)
	4-May	Components of a scientific paper		
	5-May	The Carbon Cycle Continued, Nitrogen and Phosphorus Cycles	Ch. 8	
7	10-May	The Biosphere, Outside Excursion (Soil and Biota Observations)	Ch. 9	Q6 HW3
	11-May	Photosynthesis Experiment		
	12-May	Photosynthesis Experiment Data Analysis, Carbon Cycle Workshop, Geologic Time Scale	Ch. 10, HW4	
8	17-May	The Origin of Earth and Life	Ch. 10	Q7, Draft FP (5/16)
	18-May	Respiration Experiment		
	19-May	UFORE Data Collection		
9	24-May	UFORE Data Collection		Q8, HW4
	25-May	Effect of Life on the Atmosphere	Ch. 11	
	26-May	Rise of Oxygen and Oxygen Regulation		
10	31-May	Final Project Presentations (Recent and Future Climate, Global Warming)	Ch. 15/16	Final Project (5/30)
	1-June	Final Project Presentations Continued		
	2-June	Final Project Presentations Continued		

**Grade Distribution:**

Homework	40%
Quizzes	40%
Final Project	15%
Participation	5%

**Contact Information:**

Thea Wilson  
 tmwilson@northwestern.edu  
 Tech A221, x7-3664