

GEOL 3520 MWF 3:00 PM
Environmental Issues in the Geosciences Hellems 252

Professor: Jim White 492-8437 or 5495 email: jwhite@spot.colorado.edu
Office Hours: MWF 11AM-Noon or by appointment

Topic Outline

I. Energy

A. Sources

renewable and non-renewable
lifetimes and production/consumption ratios
for each energy source
potential
availability
amount used in different parts of the world
advantages and disadvantages

B. Production and consumption

imports and exports on a global scale
use by geographic area and type

C. Use in economic sectors (US example): efficiencies and costs

industry
transportation
residential/commercial

C. The cost of doing business: by products (CO₂, etc.)

II. The World Leader Homework: supplying energy in 2025

III. A brief tour through the carbon cycle

A. Sources, sinks and fluxes

B. Imbalance in global fluxes and the secret sink: biosphere and ocean

C. Implications for future CO₂ levels

IV. Climate dynamics and future climate

A. General circulation models

B. Predictions

C. Confidence levels

V. What lies ahead... and how do we adapt?

Grading:

2 exams	25% each
final	30%
homework	20%

Readings: Energy for Planet Earth, Scientific American Books

Web site with all class notes: <http://www.Colorado.EDU/GeolSci/courses/GEOL3520/>

GEOL 1070: Global Change

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MWF 1 PM GEOL 121

Text: Environmental Science, Botkin and Keller

This course will focus on the structure and functioning of the Earth's surface, and in particular, how humans interact with those systems. We will build on what you have learned in GEOL 1060.

There will be 2 exams during the semester, plus the final exam. There will also be 4 quizzes during the semester. You may drop one of the quizzes. Exams, including the final exam, are non-cumulative. Exams *will* cover quiz materials. If you know that you will miss an exam or a quiz and wish to make it up, you must see the Professor prior to the exam or quiz.

Grading:

Each quiz:	10%	(total of 30%)
Each exam:	20%	(total of 40%)
Final exam:	30%	

Quiz and Exam schedule:

Quiz 1:	Monday, Feb 5
Exam 1:	Wednesday, Feb 21
Quiz 2:	Monday, March 4
Exam 2:	Wednesday, March 20
Quiz 3:	Monday, April 8
Quiz 4:	Monday, April 22

Final exam: Thursday, May 9, 7:30 am to 10:30 am, GEOL 121

Course Outline

- I. Introduction to Environmental Sciences
- II. The Earth as a System
 - A. Concepts of fluxes, cycles and feedbacks
 - B. Non-linear systems
 - C. Equilibrium and steady state
- III. Biogeochemical cycles
 - A. Carbon
 - B. Nitrogen
 - C. Phosphorous
 - D. Sulfur
- IV. Human population
- V. Impacts of agriculture on the environment
- VI. Energy
 - A. Basics and definitions
 - B. Fossil fuels
 - C. Non-fossil fuels
- VII. Water and the hydrologic cycle
- VIII. Environmental policy
 - A. Waste and the garbage issue
 - B. Mineral resources
- IX. Humans as the Major Agent of Global Change

Readings

- Chapters 1 and 2
- Chapter 3
- Chapter 4
- Chapter 5
- Chapters 10 and 11
- Chapters 15, 16, 17, 18
- Chapter 19 and 20
- Chapters 27, 28
- Chapters 29 and 30

Copies of overheads shown in class are available on the World Wide Web at:

<http://www.Colorado.EDU/GeolSci/courses/GEOL1070/>