

*Weather*

*Survey*

*Survey  
1st Global Env*

## SYLLABUS

A11-0, Global Environmental Change, 1.0 Credit  
Lecture, Section 1, Star #38965  
Meeting times: M,W,F; 2:00-3:00 PM  
Meeting room: 301 Locy  
Spring Quarter, 1997

### Instructor

Dr. Gerald J. Kuecher  
e-mail (H): gkuecher@aol.com  
Dept. phone: 491-3238  
Office hours: 1:00-2:00 MWF; 2:00-2:30 MWF

### Important Dates:

First day of class on Tuesday, April 1  
Midterm Examination on Friday, May 2.  
Memorial Day holiday on Monday, May 26  
Reading Week June 3-6  
Final Examination on Thursday, June 12, 9:00-11:00 AM

### Required text:

Mackenzie, F.T., and Mackenzie, J.A., 1995. Our Changing Planet: an Introduction to Earth System Science and Global Environmental Change, Prentice Hall, NJ, 387 pp.

Lab exercises will be distributed weekly, as there is no formal lab manual. Printed lab materials will be distributed each week in accordance with the "discussion" schedule. Students will be asked to contribute \$3.00 each to offset instructor's costs for photocopying.

### Basis for Grades

The objective of this class is to identify the major forcing functions of global environmental change, both anthropogenic and natural. Cause and effect are determined and remediation methods proposed. The present environment is studied to provide a baseline for change. Past environments provide insight to changing environments on an evolving Earth.

This course is composed of lecture as well as discussion (lab), and as such, the grade will include components from both lecture and lab. We will have two tests, a Midterm and a Final Examination and these will each count as 1/3 of the grade. The remaining 1/3 will come from the average of lab scores. The final average will be compared to the grade scale provided below in assigning final grades:

A = 92-100  
B = 83-91  
C = 74-82  
D = 65-73  
E = less than 64.5

### Preliminary Schedule

- April 1: Introduction to scales, systems, cycles. Orders of magnitude. Discussion of syllabus, expectations, set up lab sections. How many signed for Tuesday lab? How many for Thursday lab? If split, cancel Thursday lab this week. Questionnaire.
- April 2: Origins of the Universe, solar system, and the Earth. Origins of life, "primordial soup."  
*M&M, Chapter 1*  
Slide presentation
- April 4: The geological time scale. Relative vs absolute time methods. Principles of stratigraphy. Review theories of life appearance and extinctions. Discuss Gould's book, "Wonderful Life"  
Show slides on unconformities, significance.  
Show GSA video on "The Earth has a History"
- April 7: Earth's structure, interior. Plate tectonics. Rates. Wegener's work. Confirmation.  
Show transparencies and slides.  
*M&M Chapter 2*
- April 9: Volcanoes as agents of change.  
Krafft video, Indonesian slides.
- April 11: Rock types. Rock cycle. Soil and climate. Geochemical cycling, models.
- April 14: Earth's atmosphere. Residence time. Sources and sinks. Atmospheric pollution.  
*M&M Chapter 3*
- April 16: Earth's hydrosphere. Residence time. Turnover time. Currents. El Nino.
- April 18: Seawater composition. Origin of salts in ocean. Calculate answers to study questions.
- April 21: The Earth's ecosphere. Classification of living things.  
*M&M Chapter 4*  
Show "Life on Earth" video.
- April 23: Dynamics of ecosystems. Food chains. Ecological relationships. The marine ecosystem. The terrestrial ecosystem. Differences. Extinction patterns in geologic time. Species diversity through time. Productivity of ecosystems.
- April 28: Biogeochemical cycles. Photosynthesis and respiration.  
*M&M Chapter 5*
- April 30: Carbon, oxygen, nitrogen cycles. Carbon dioxide cycling over time vs climate. Global sequestration, implications.
- May 2: MIDTERM EXAMINATION.

- May 5: World population, historical perspective. Class exercise on density. Overpopulated?  
Environmental slides.  
*M&M Chapter 6*
- May 7: Midterm scores distributed. Malthusian vs logistic growth. Pressures.
- May 9: Energy and materials resources. Hubbert prediction. Future trends.
- May 12: Terrestrial vegetation. Where are the forests?  
*M&M Chapter 7*
- May 14: Forest ecosystems. Effects on biodiversity, world's oxygen, sink for carbon dioxide.
- May 16: Fertilizers, food. Long term storage of foods in Antarctica? Food crisis.
- May 19: The changing land surface. Soil.  
*M&M Chapter 8*
- May 21: Water pollution, municipal wastes, coastal zones.
- May 23: The changing atmosphere. Acid rain.  
*M&M Chapter 9*
- May 26: MEMORIAL DAY HOLIDAY
- May 28: The changing atmosphere. Global climate change.  
*M&M Chapter 10*
- May 30: Astronomical forcing functions of the great ice ages.
- June 2: Trends, implications. Concluding remarks.  
*M&M Chapter 11*
- June 12: FINAL EXAMINATION

*Students may e-mail me on June 14 to obtain results on the Final and to obtain their final course grades. Cheers!*