

ENS-1001 **THE EARTH SYSTEM: SCIENCE, ENGINEERING, MANAGEMENT, AND EDUCATION**
 SPRING, 1999
 T-R 5:00 – 6:15 p.m.
 Course Outline

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The Course Description:

A series of seminar-style presentations by faculty, invited lecturers, and students. Designed to holistically understand the Earth as a system, and the complexities of the interactions between: the near earth space environment, the solid Earth, the fluid Earth, and the living Earth including mankind. One topic is chosen each term to allow an in-depth treatment of the interactions in the Earth System. For Spring 1999 term, the focus of this course will be Extreme Natural Hazards.

A whole earth approach to understanding these complex interactions requires understanding the components of “the earth system:” the cosmosphere, the geosphere, the hydrosphere, the atmosphere, the biosphere, and the anthroposphere. With the advance of modern, sophisticated science and technology it is now becoming possible to begin to quantify these very complex interactions and for the first time develop a holistic view of the earth. This new way of viewing the earth has been called Earth System Science and is profoundly affecting traditional scientific and engineering disciplines.

The Course Objectives:

- To show the relationships between the “spheres,” cosmosphere, geosphere, hydrosphere, atmosphere, biosphere, and anthroposphere, in understanding how the earth works by using an integrated understanding of the fundamental sciences, physics, mathematics, chemistry and biology,
- To develop simple, quantitative models for understanding the interaction of the earth systems,
- To critically evaluate current scientific claims of changes in the earth system,
- To develop team problem solving skills, and
- To develop high quality oral and written technical communication.

Textbook: Bryant, E.A., Natural Hazards, Cambridge University Press, 294 pp., 1991.

Course Outline:

Week	Topic	Speaker
1 (12,14 Jan)	Introducing Earth as a System Overview of the Cosmosphere & the Geosphere	Maul et al. Rassoul
2 (19,21 Jan)	Overview of the Hydrosphere & the Atmosphere Overview of the Biosphere & the Anthroposphere	Windsor & Witiw Bush & Duedall
3 (26,28 Jan)	First White Paper: Integrating the Spheres Hazards from Space	Moldwin
4 (2,4 Feb)	Wind and Storm Hazards Oceanographic Hazards	Witiw Windsor
5 (9,11 Feb)	Second White Paper Drought Hazards	Bush
6 (16,18 Feb)	Precipitation Hazards Flood Hazards	Witiw Witiw
7 (23,25 Feb)	Third White Paper Fire Hazards	Bush
8 (2,4 Mar)	Causes of Earthquakes and Volcanoes Earthquake & Tsunami	Rassoul Rassoul & Maul
9	Semester Break	
10 (16,18 Mar)	Volcano Hazards Fourth White Paper	Rassoul
11 (23,25 Mar)	Land Instability Hazards Medical Aspects of Natural Hazards	Duedall Liebler
12 (30Mar,1Apr)	Natural Biological Hazards Fifth White Paper	Norris
13 (6,8 Apr)	Economic Aspects of Natural Hazards Psychological Aspects of Natural Hazards	Slotkin & Chambliss Krist
14 (13,15 Apr)	Sixth White Paper Engineering Design for Natural Hazards	Pinelli
15 (20,22 Apr)	Governing Management of Natural Hazards Educating the Public	Barile Duedall
16 (27,29 Apr)	Seventh White Paper Integrating the Experience	All