N. Carolina State

Survey
NCS Intro to ESS

**Introduction to Earth System Science - Exploring The Connections**

MEA 100 Fall 1998
D. DeMaster: Monday, Wednesday, Friday 9:10-10:00am, Caldwell Hall Room G107
V. Connors: Tuesday, Thursday 9:50-11:05am, Weaver Hall Room 158

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**Text:**

*Elemental Geosystems*, Second Edition, Christopherson, Prentice Hall, 1998.

Lab Manual:
MEA 100L CoursePak: Introduction to Earth System Science, Fall 1998

**References:** On reserve in the Natural Resources Library, Jordan Hall

- *Our Changing Planet: An Introduction to Earth System Science and Global Environmental Change*, Mackenzie, Second Edition, Prentice Hall, 1998.
- *Atmospheric Change: An Earth System Perspective* , Graedel and Crutzen, Freeman and Company, 1993.
- *The Nature and Causes of Climate Change: Assessing the Long Term Future* , Goodess, Palutikof, and Davies, Lewis Publishers, 1992.
- *Biogeochemistry: An Analysis of Global Change* , Schlesinger, Academic Press, 1991;
- *The Secret Melody and Man Created the Universe* , Thuan, Oxford University Press, 1995.
- *Earth System Science: A Program for Global Change* , NASA Advisory Council, NASA, Washington, DC 20546, 1986.
- *Intergovernmental Panel on Climate Change (IPCC) Technical Papers 1-4 and Summary for Policy Makers*, United Nations Framework Convention on Climate Change, 1997.

**Internet Resources:**

*A Gateway to Earth System Science Resources*

*Prentice Hall's Earth on the Internet: A Field Guide for Geoscience Students*

*Elemental Geosystems* Companion Web Site by Christopherson; go to the chapter you want, click on the "begin" button, and take practice quizzes with immediate scoring from the publisher! Click on to "destinations" and see an organized list of related links.

*MEA 100 Course Web Page*: Your course web page includes the lecture and lab syllabi, notes, homework assignments, the quizzes, related links to other web sites, and other course information.

**Why Earth System Science :**

> *The goal of Earth System Science is to obtain a scientific understanding of the entire Earth system on a global scale by describing how its component parts and their interactions have evolved, how they function, and how they may be expected to continue to evolve on all timescales. The challenge to Earth System Science is to develop the capability to predict those changes that will occur in the next decade to century, both naturally and in response to human activity.(NASA, 1986)*

**NCSU Earth System Science Education Team**

- Dr. Robert Bereman (Chemistry Department)
- Dr. David DeMaster (MEAS Dept) Instructor MEA 100
- Dr. Jerry Watson (MEAS Dept)
- Dr. Skip Stoddard (MEAS Dept)

- Dr. Dan Kamykowski (MEAS Dept) Lab Coordinator
- Dr. Vickie Connors (NASA LaRC; MEAS Dept) Instructor MEA 100

- Dr. Tom Hopkins (MEAS Dept) Instructor MEA 400

**Teaching Assistants during Fall 1998**
- Brahm Malik (MEA 100-201)
- C. Wynne Bort (MEA 100-202 & 203)
- Jamie Mitchem (MEA 100-204 & 207)
- Hari Warrior (MEA 100-205)
- Sudeep Vaswani (MEA 100-206)
- Jennifer Kehoe (MEA 100-208)

**Teaching Assistants during Fall 1997 and Spring 1998**
- Neil Jacobs (MEA 100)
- Mitch Smith (MEA 100)
- Chris Petrusak (MEA 100)
- Billy Sweet (MEA 400)

**Teaching Assistants and other helpers during Spring-Summer 1997**
- Greg Faluvegi
- Anne Marie Queen (TA MEA 100)
- Jen Otter (TA MEA 400)

**Course Objectives :**

1. Develop a basic understanding of the major components and processes of the four primary Earth systems;
2. Recognize linkages between the Earth systems;
3. Develop an understanding of dynamic equilibrium and feedback loops between and among the Earth systems;
4. Develop an insight for the anthropogenic influences on the Earth systems; and
5. Learn to use computer simulations to model behavior of the Earth systems.

**Grading System :**

**For Dr. Connors' section only**: To be eligible for a grade in this section, you must visit me briefly between Aug18-Sep8 for about ten minutes. A sign-up sheet will be posted outside my door for you to make an appointment.

**For both MEA 100 Sections:**

Attendance and participation in class is a must. Attendance and participation in lab is **MANDATORY!** Make-up labs for excused absences must be arranged ahead of time with the lab instructor, lecture instructor, or TA. ONE makeup lab will be offerred during the last week of this semester in your regular lab class time. We expect you to read the lab material BEFORE each lab session and to turn in the lab report before you leave each lab session.

This course will be scored on the basis of an accumulation of points throughout the semester. The mandatory lab is worth 25% of the course grade; the lab contributes 150 points. **Attendance is MANDATORY in lab.** The tests and term project will be worth 100 points each. You may prepare a notecard on a 5"x7" index card for each test. During class, pop-quizzes, valued at 5 points each, will be given (these should last only ~2 minutes and will be from your reading assignments); the top ten scores will count towards your grade. You will need to buy 3"x5" index cards for your in-class quizzes. You should expect pop quizzes in your lab class as well. Ten homework assignments (an alternative combination of problems, internet searches, and short papers) will accumulate another 100 points. Homework assignment must be turned in on time; your work will