

APPROVED DEC 07 2005

UC 8801 OSF

UNIVERSITY of HOUSTON

CORE CURRICULUM COURSE REQUEST, RECEIVED NOV 17 2005

Originating Department/College: Geosciences / NSM

Person making request: William Dupre Telephone: 3-342-5

Dean's signature: [Signature] Date: 11/15/05

I. General Information:

Course number and title: GEOL 1302 - Introduction to Global Climate Change

Complete catalog description (NOT required if attached to CBM 003 form):

Category of Core for which course is being proposed (mark only one):

- Communication
- Communication: Writing Intensive Experiences in the Disciplines
- Mathematics
- Mathematics/Reasoning (IDO)
- Natural Sciences
- Humanities
- Visual/Performing Arts Critical
- Visual/Performing Arts Experiential
- Social/Behavioral Sciences
- U.S. History
- American Government

II. Objectives and Evaluation (respond on one or more separate sheets):

Call 3-0919 for a copy of "Guidelines for Requesting and Evaluating Core Courses" or visit the website at www.uh.edu/academics/corecurriculum

- How does the proposed course meet the appropriate Exemplary Educational Objectives (see Guidelines). Attach a syllabus and supporting materials for the objectives the syllabus does not make clear.
- Specify the processes and procedures for evaluating course effectiveness in regard to its goals.
- Delineate how these evaluation results will be used to improve the course?

CBM003 ADD/CHANGE FORM

Undergraduate Council
 New Course Course Change
 Core Category: Nat Sci Effective Fall 2006

or Graduate/Professional Studies Council
 New Course Course Change
 Effective Fall ____

1. Department: Geosciences College: NSM
2. Person Submitting Form: James Lawrence Telephone: 713-743-3410
3. Course Information on New/Revised course:
 - Instructional Area / Course Number / Long Course Title:
GEOL / 1302 / Introduction to Global Climate Change
 - Instructional Area / Course Number / Short Course Title (30 characters max.)
GEOL / 1302 / INTRO TO CLIMATE CHANGE
 - SCH: 3.00 Level: FR CIP Code: 4004010002 Lect Hrs: 3 Lab Hrs: 0
4. Justification for adding/changing course: To meet core curriculum requirements
5. Was the proposed/revised course previously offered as a special topics course? Yes No
 If Yes, please complete:
 - Instructional Area / Course Number / Long Course Title:
_____ / _____ / _____
 - Content ID: _____ Start Date (yyyy3): _____
6. Is this course offered for undergraduate credit only? Yes No
7. Authorized Degree Program(s): BS Environmental Science
 - Does this course affect major/minor requirements in the College/Department? Yes No
 - Does this course affect major/minor requirements in other Colleges/Departments? Yes No
 - Are special fees attached to this course? Yes No
 - Can the course be repeated for credit? Yes No
8. Grade Option: Letter (A, B, C ...) Instruction Type: lecture
9. If this form involves a change to an existing course, please obtain the following information from the course inventory: Instructional Area / Course Number / Long Course Title
GEOL / 1302 / Introduction to Global Climate Change
 - Start Date (yyyy3): 20033 Content I.D.: 290716
10. Proposed Catalog Description:
 Cr: (3-0) Prerequisites: MATH 1310 or 1311 Description (30 words max.): Examines how past climate records and models provide a better understanding of possible future climate changes. Greenhouse gases, solar output, Earth's orbit, and anthropogenic effects.

11. Dean's Signature:  Date: 10 Oct '05
 Print/Type Name: Ian Evans

A. How does the proposed course meet the appropriate Exemplary Educations Objectives. Attach a syllabus and any supporting materials.

GEOL1302: Syllabus:

GEOL 1302

Introduction to Global Climate Change

3 CREDITS

Instructor

Dr. Barry L. Lefer

Course Description

This course examines the various factors which govern changes over time in the Earth's climate system (atmosphere, oceans, vegetation, land surface and ice sheets). Course will emphasize how scientists approached these interdisciplinary nature of climate system and discuss and evaluate competing theories used to explain the climate record on various time scales. This includes natural changes in greenhouse gas concentrations, the strength of the sun, the Earth's orbit around the sun, effects of volcanic eruptions, as well as changes in internal phenomena such as El Nino and the circulation of the world oceans, and finally, human or "anthropogenic" effects associated with industrial greenhouse gas emissions. An understanding of past changes is used as a framework for predicting future climate change. Course will be taught for non-science majors with a focus on understanding processes and evaluating hypothesizes.

Lectures

The course meets MW 11:30 AM-01:00 PM in Room 128 of the Science & Research Bldg#1. Attendance of all lectures is expected. You are strongly encouraged to ask questions and participate constructively in class.

Textbook

Earth's Climate Past and Future [available from bookstore] by William F. Ruddiman, 2001.

COURSE SCHEDULE

Class# Date Subject

Section I: Introduction & Overview

1	8/22 M	Framework of climate science
2	8/24 W	Cycles of forcing and response: Climate interactions and feedbacks
3	8/29 M	Heat transfer in the atmosphere and oceans
4	8/31 W	Earth's weather and climate
	9/05 M	Labor Day – No Class
5	9/07 W	Techniques to extract, reconstruct, and interpret Earth's climate
6	9/12 M	How do climate models work?
7	9/14 W	Exam #1

Section II: Tectonic-Scale Climate Changes

8	9/19 M	The faint young Sun paradox
9	9/21 W	The BLAG hypothesis: CO ₂ input

- 10 9/26 M The Uplift weathering hypothesis
- 11 9/28 W Tectonic-scale changes in sea level: competing theories
- 12 10/03 M The Cretaceous greenhouse and into the ice house
- 13 10/05 W **Exam #2**

Section III: Orbital Effects and Ice Ages

- 14 10/10 M Variations in Earth's orbit
- 15 10/12 W The Kutzbach theory: Orbital changes drive monsoon cycles
- 16 10/17 M Modeling the behavior of ice-sheet formation
- 17 10/19 W The Milankovitch theory: Orbital changes drive ice-sheet cycles
- 18 10/24 M Ice core records of past climate: T, CO₂, CH₄, dust
- 19 10/27 W **Exam #3**

Section IV: Historical Climate Changes

- 20 10/31 M Climate record during the last deglaciation
- 21 11/02 W Climate changes in past centuries
- 22 11/07 M The "Little ice age" and "Medieval warm period"
- 23 11/09 W El Niño, ocean circulation, volcanic eruptions & solar changes
- 24 11/14 M Millennial oscillations and interactions within the climate system
- 25 11/16 W **Exam #4**

Section V: Present/Future Climate Changes

- 26 11/21 M Humans, climate, evolution and agriculture
- 11/23 W Thanksgiving Break
- 27 11/28 M 20th century climate change: the data record
- 28 11/30 W "The day after tomorrow", Public policy and the Kyoto Protocol
- 29 12/05 M The greenhouse debate and M. Crichton's "A State of Fear"
- 30 12/07 W Future climate, energy, and societal pathways
- 31 12/12 M **Final Exam (11 AM - 2 PM)**

B. Specify the processes and procedures for evaluating course effectiveness in regard to its goals.

Students are regularly evaluated (4 exams + a Final) on what they are learning. In addition the students are given a detailed questionnaire at the end of the semester to inquire about student response to various teaching methods employed during semester and to solicit suggestions on which sections need improvement and which could be expanded upon.

C. Delineate how these evaluation results will be used to improve the course.

In addition to looking at exam and questionnaire results to direct improvements in the how and what material is presented in the course. The instructor will continue to incorporate new scientific discoveries that will likely occur in all of the sections of the course and public policy updates (impacting Section V) into the curriculum. It is tempting to expand Section V, but difficult to determine which "background" section to shorten. If pressed, I would suggest shortening section II to make room for additions to Section V.