UC 8613 05F

CBM003 ADD/CHANGE FORM

☒ Undergraduate Council	or	☐ Graduate/Professional Studies Council
☐ New Course ☒ Course Change		☐ New Course ☐ Course Change
Core Category: Nat Sci Effective Fall 2006		Effective Fall __

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APPROVED FEB 2 2 2006

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

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U N I V E R S I T Y *of* H O U S T O N

CORE CURRICULUM COURSE REQUEST

Originating Department/College: Geosciences / NSM

Person making request: James Lawrence Telephone: x 33410

Dean's signature: Date: 12/13/05

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

A. 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.

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

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

SVP. Effective 9/20/05. Replaces all previous forms, which may no longer be used.

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

GEOL1302: Syllabus:

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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: Obital changes drive ice-sheet cycles
18	10/24 M	Ice core records of past climate: T, CO_2, CH_4, 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.