UNIVERSITY OF HOUSTON
CORE CURRICULUM COURSE REQUEST

1. General Information:

Course number and title: 

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/Quantitative (MQ)
- 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?

SVP Effective 9/20/05. Replaces all previous forms, which may no longer be used.
CBM003 Add/Change Form

- Undergraduate Council: Yes
- New Course: Yes
- Course Change: No

Core Category: NatSci
Effective Fall 2006

1. Department: Geosciences
   College: NSM
   Telephone: 713-743-310

2. Person Submitting Form: James Lawrence
   Form Date: 2/25/03
   Telephone: 713-743-310

3. Course Information on New/Revised course:
   - Instructional Area / Course Number / Long Course Title:
     GEO/FL 302 / Introduction to Global Climate Change
   - Instructional Area / Course Number / Short Course Title:
     GEO/FL 302 / INTRO TO CLIMATE CHANGE
   - Course Code: 300
   - Level: ER
   - CIP Code: 400400
   - Lecture Hrs: 3
   - Lab Hrs: 2

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: Yes, No: No
   If Yes, please complete:
   - Instructional Area / Course Number / Long Course Title:
     GEO/FL 302 / Introduction to Global Climate Change
   - Content ID: 300
   - Start Date (yyyy): 2003

6. Is this course offered for undergraduate credit only? Yes: Yes, No: Yes

7. Authorized Degree Program(s): BS Environmental Science
   - Does this course affect major/minor requirements in the College/Department? Yes: Yes, No: No
   - Does this course affect major/minor requirements in other Colleges/Departments? Yes: Yes, No: No
   - Are special fees attached to this course? Yes: Yes, No: No
   - Can the course be repeated for credit? Yes: Yes, No: No

8. Grade Option: Letter (A, B, C...)
   Instruction Type: Lecture
   Instructor: Lawrence
   Course Code: 300
   Start Date: 2/25/03
   Course ID: 12/27/04
   Content ID: 2003

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:
     GEO/FL 302 / Introduction to Global Climate Change
   - Start Date (yyyy): 2003
   - Content ID: 2003

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: 2/25/03
   Print/Type Name: Jan Evans
A. How does the proposed course meet the appropriate Exemplary Education Objectives. Attach a syllabus and any supporting materials.

GEOL 1302: 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 inter-disciplinary 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 hypotheses.

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

COURSE SCHEDULE

Class# Day 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
5 9/05 M Labor Day — No Class
6 9/07 W Techniques to extract, reconstruct, and interpret Earth’s climate
7 9/12 M How do climate models work?
8 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: CO2 input
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>9/26 M</td>
<td>The Uplift weathering hypothesis</td>
</tr>
<tr>
<td>9/26 W</td>
<td>Tectonic-scale changes in sea level: competing theories</td>
</tr>
<tr>
<td>9/30 M</td>
<td>The Conscious greenhouse and into the ice age</td>
</tr>
<tr>
<td>10/2 W</td>
<td>Exam #2</td>
</tr>
<tr>
<td>10/10 M</td>
<td>Variations in Earth's orbit</td>
</tr>
<tr>
<td>10/12 W</td>
<td>The Kuz-bach theory: Orbital changes drive monsoon cycles</td>
</tr>
<tr>
<td>10/17 M</td>
<td>Modeling the behavior of ice-sheet formation</td>
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<tr>
<td>10/19 W</td>
<td>The Milankovitch theory: Orbital changes drive ice-sheet cycles</td>
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<tr>
<td>10/24 M</td>
<td>Ice core records of past climate: CO₂, CH₄, dust</td>
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<tr>
<td>10/27 W</td>
<td>Exam #3</td>
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<tr>
<td>10/31 M</td>
<td>Climate record during the last glaciation</td>
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<tr>
<td>11/2 W</td>
<td>Climate changes in past centuries</td>
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<tr>
<td>11/7 M</td>
<td>The &quot;Little ice age&quot; and &quot;Medieval warm period&quot;</td>
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<tr>
<td>11/9 W</td>
<td>El Niño, ocean circulation, volcanic eruptions &amp; solars changes</td>
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<tr>
<td>11/14 M</td>
<td>Millennial oscillations and interactions within the climate system</td>
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<tr>
<td>11/16 W</td>
<td>Exam #4</td>
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Section IV: Historical Climate Changes

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<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>11/1 M</td>
<td>Humans, climate, evolution and agriculture</td>
</tr>
<tr>
<td>11/3 W</td>
<td>Thanksgiving Break</td>
</tr>
<tr>
<td>11/28 M</td>
<td>20th century climate change: the data record</td>
</tr>
<tr>
<td>11/30 W</td>
<td>&quot;The day after tomorrow&quot;, Public policy and the Kyoto Protocol</td>
</tr>
<tr>
<td>12/5 M</td>
<td>The greenhouse debate and M. Crichton's &quot;A State of Fear&quot;</td>
</tr>
<tr>
<td>12/7 W</td>
<td>Future climate, energy, and societal pathways</td>
</tr>
<tr>
<td>12/12 M</td>
<td>Final Exam (11 AM - 2 PM)</td>
</tr>
</tbody>
</table>

Section V: Present/Future Climate Changes

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<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>12/12 M</td>
<td>Final Exam (11 AM - 2 PM)</td>
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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 the 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.

GEOL 1302 Introduction to Global Climate Change