Life and Physical Sciences
Texas A&M University

Core Curriculum

Initial Request for a lower division course included in the current Core Curriculum
to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Geography

2. Course prefix and number: GEOG 205

3. Texas Common Course Number: [Enter text]

4. Complete course title: Environmental Change

5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:
   - Communications
   - Mathematics
   - Life and Physical Sciences
   - Language, Philosophy and Culture
   - Creative Arts
   - American History
   - Government/Political Science
   - Social and Behavioral Sciences

7. This course should also be considered for International and Cultural Diversity (ICD) designation:
   - Yes
   - No

8. How frequently will the class be offered? Fall and Spring Semesters

9. Number of class sections per semester: 1

10. Number of students per semester: Up to 100 students per semester


   This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department should be in attendance when considered by the Core Curriculum Council.

12. Submitting request should be in attendance when considered by the Core Curriculum Council.

13. Submitted by: [Signatures] [Date]
   - Course Instructor

14. Approvals: [Signatures] [Date]
   - Department Head

15. College Dean/Designee: [Signatures] [Date]

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
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Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

How does the proposed course specifically address the Foundational Component Area definition above?

The objective of this course is to explore our dynamic biophysical environment and to consider how it has and will continue to change. Through the use of place-based case studies, students are introduced to the biophysical environment using a systems approach that describes the feedbacks between the atmosphere, hydrosphere, lithosphere and biosphere at a range of scales. Specifically, students are introduced to fundamental concepts and a general conceptual model of environmental change through the lectures, and are required to use the scientific method to analyze and interpret sample data of environmental change at a range of spatial and temporal scales collected using a variety of methods. The analyses completed in the laboratory exercises will allow the students to make predictions about the nature and extent of future environmental change in the future, and to assess the importance of human-natural coupling affecting that change.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective, and how student learning of each objective will be evaluated.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

The design of this course introduces students to the scientific method through problem-based students to scientific inquiry through problem-based assignments that require students complete a literature review, develop hypotheses for a real-life scenario based on that literature review and complete an analysis of sample data to test those hypotheses. The lectures provide students with the fundamental concepts in physical geography and introduce a conceptual framework to understand how and why the environment changes at a range of spatial and temporal scales. Participation in online discussions/debates, summary of the arguments made during the online discussions and tests reinforce problem solving, analysis techniques and the development of testable hypotheses.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

To understand and explain how the environment changes requires that students are able to interpret and synthesize existing literature with a focus on refereed journal articles. Specifically, each assignment requires that students: 1) compose a literature review that effectively summarizes the literature, 2) develop testable hypotheses based on their understanding of the literature, 3) test those hypotheses using sample data, and 4) communicate their interpretation of the sample data. Testing the hypotheses requires that students are able to
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communicate the results of their analysis through effective graphing of time and spatial series. Students are also provided an opportunity to development communication skills through in-class activities discussions, participation in online discussions/debates, summary of the arguments made during the online discussions and essay-based questions or exams.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

The majority of this class requires students be able to interpret and analyze temporal and spatial data of environmental change at a range of scales and using a variety of measurement techniques. In this respect, the students are required to relate conceptual models (presented through the lectures), with empirical facts from the literature and the results of their own analyses of sample datasets.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

Students are encouraged to openly discuss and debate causes and projections of past and future environmental change based on empirical data and conceptual models of change introduced in the lectures with a specific focus on past and current climate change. In-class activities and the online discussions also require students to collaborate in the interpretation of quantitative and qualitative data of past environmental change, which requires them to communicate with one another and develop a common statement about why and how the environment has and will continue to change. The role of each team member is integral to obtaining a complete dataset and/or completing the analyses and discussing the results. The contributions of each student to the online discussions and the biweekly assignments will be assessed by the observations of the Teaching Assistant, by peer review, and by the student’s own reflections.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
TEXAS A&M UNIVERSITY
DEPARTMENT OF GEOGRAPHY
GEOG 205 ENVIRONMENTAL CHANGE

INSTRUCTOR: Dr. Chris Houser

EMAIL: chouser@tamu.edu

OFFICE HOURS: TBA

OFFICE: CSA207

LECTURES: Tues and Thurs. 9:35-10:50

HECC 203

ONLINE COURSE INFORMATION: http://ecampus.tamu.edu

COURSE DESCRIPTION: systems perspective on important attributes, elements and connections within Earth's physical environment; dynamic nature of environment at multiple spatial and temporal scales

OBJECTIVES: The objective of this course is to explore our dynamic biophysical environment and to consider how it has and will continue to change. Through the use of place-based case studies, students are introduced to the biophysical environment using a systems approach that describes the feedbacks between the atmosphere, hydrosphere, lithosphere and biosphere at a range of temporal scales.

LEARNING OUTCOMES: At the end of the course, students are expected to:

1. Identify and describe the important attributes, elements and connections within the physical environment from a systems perspective
2. Describe the dynamic nature of the environment at a range of spatial and temporal scales and how change results from adjustments between the different components
3. Understand and apply methods and technology to measuring environmental change and recognize the limitations to these methods in predicting change
4. Describe how environmental change of the past and present has and continues to affect society and the feedbacks therein

COURSE EVALUATION SCHEME: Bi-weekly assignments (6 @ 5%) 30%
Online Discussion Participation (5 @ 2%) 10%
Online Discussion Review (5 @ 3%) 15%
Exam 1 10%
Exam 2 15%
Exam 3 20%

The three exams will be based on the material covered in the lectures and readings, although the tests will emphasize the material covered in the lectures. While the tests are non-cumulative the material is based on similar concepts and builds towards a unified model of environmental change.
### GRADING SCHEME:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>≥90%</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>80-89%</td>
</tr>
<tr>
<td>C</td>
<td>Satisfactory</td>
<td>70-79%</td>
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<tr>
<td>D</td>
<td>Passing</td>
<td>60-69%</td>
</tr>
<tr>
<td>F</td>
<td>Failing</td>
<td>&lt;60%</td>
</tr>
</tbody>
</table>

### SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Readings</th>
<th>Assignments and Debates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Definition of Change</td>
<td>Dynamic Systems</td>
<td>Assign. #1: Scales of Environmental Change</td>
</tr>
<tr>
<td>2</td>
<td>Feedbacks and Equilibrium</td>
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<tr>
<td>3</td>
<td>Earth’s Climate System</td>
<td>Climate Regions</td>
<td>Discussion #1: Stability of Earth’s Climate</td>
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<tr>
<td>4</td>
<td>Biophysical Systems</td>
<td></td>
<td>Assign. #2: Fuzzy Boundaries</td>
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<tr>
<td>5</td>
<td>Landscape Response</td>
<td></td>
<td>Exam 1</td>
</tr>
<tr>
<td>6</td>
<td>Short Term Climate Variability</td>
<td>Climate changes over the last 1000 years</td>
<td>Discussion #2: Supporting Evidence</td>
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<tr>
<td>7</td>
<td>Climate Variability and History</td>
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<td>Assign. #3: Historical Accounts of Changing Environments</td>
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<tr>
<td>8</td>
<td>Under a Mile of Ice</td>
<td>Glacial History of North America</td>
<td>Discussion #3: Responding to Sea Level Rise</td>
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<tr>
<td>9</td>
<td>Sea Level Variability</td>
<td></td>
<td>Assign. #4: The Shoreline of Texas</td>
</tr>
<tr>
<td>10</td>
<td>Ancient Climates</td>
<td>Very old earth</td>
<td>Discussion #4: Biological and Geological Controls</td>
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<tr>
<td>11</td>
<td>First Earth</td>
<td></td>
<td>Exam 2</td>
</tr>
<tr>
<td>12</td>
<td>Carbon Cycle</td>
<td>Carbon Cycle</td>
<td>Assign. #5: Mountain Building and Erosion</td>
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<tr>
<td>13</td>
<td>Carbon Cycle Cont’d</td>
<td></td>
<td>Discussion #5: Climatically Driven, Culturally Primed</td>
</tr>
<tr>
<td>14</td>
<td>Coupled Human and Natural Systems</td>
<td>Coupled Human and Natural Systems</td>
<td>Assign. #6: Human Disturbances</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Exam 3</td>
</tr>
</tbody>
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Please note that the dates and topics of the lectures and laboratories are subject to change.

**BI-WEEKLY ASSIGNMENTS:** Bi-weekly assignments will require students to work as a group to acquire and analyze data on environmental change, which will reinforce lecture material
and explore the techniques used to identify and measure natural and anthropogenic changes to the biophysical environment at a range of scales. The team of students will be required to interpret their data based on journal publications (provided through ecampus) and the online discussions (see below) to provide an understanding of how assertions about a changing environment depend on supporting evidence collected via the scientific method.

**ONLINE DISCUSSIONS:** Students will be required to participate in bi-weekly online discussions in which they are required to “gather support for their argument and debate one of the following positions...” or “serve as an expert commentator...” on focus questions posed by the instructor. The students will be graded not only the frequency of their participation but on the strength of their arguments and the data and references that they use to support their arguments. Students will also be evaluated on their ability to communicate through a short discussion a summary of the online discussion and the different sides of the debate. During the first week, the instructor will establish rules of online etiquette and a process for orderly turn-taking to ensure that everyone has an opportunity to participate.

**CORE OBJECTIVES**

**Critical Thinking:** The design of this course introduces students to the scientific method through problem-based learning, which require students to complete a literature review, develop hypotheses for a new problem, and then complete an analysis of sample data to test those hypotheses. The lectures provide students with the fundamental concepts in physical geography and introduce a conceptual framework to understand how and why the environment changes at a range of spatial and temporal scales. Participation in online discussions/debates, summary of the arguments made during the online discussions and tests reinforce problem solving, analysis techniques and the development of testable hypotheses.

**Communication:** To understand and explain how the environment changes requires that students are able to interpret and synthesize existing literature with a focus on refereed journal articles. Specifically, each assignment requires that students: 1) compose a literature review that effectively summarizes the literature, 2) develop testable hypotheses based on their understanding of the literature, 3) test those hypotheses using sample data, and 4) communicate their interpretation of the sample data. Testing the hypotheses requires that students are able to communicate the results of their analysis through effective graphing and visual representations. Students are also provided an opportunity to develop communication skills through in-class activities, discussions, participation in online discussions/debates, summary of the arguments made during the online discussions and essay-based questions on exams.

**Empirical and Quantitative Skills:** The majority of this class requires students be able to interpret and analyze temporal and spatial data of environmental change at a range of scales and using a variety of measurement techniques. In this respect, the students are required to relate conceptual models (presented through the lectures), with empirical facts from the literature and the results of their own analyses of sample datasets.
**Teamwork**: Students are encouraged to openly discuss and debate causes and projections of past and future environmental change based on empirical data and conceptual models of change introduced in the lectures with a specific focus on past and current climate change. In-class activities and the online discussions also require students to collaborate in the interpretation of quantitative and qualitative data of past environmental change, which requires them to communicate with one another and develop a common statement about why and how the environment has and will continue to change. The role of each team member is integral to obtaining a complete dataset and/or completing the analyses and discussing the results. The contributions of each student to the online discussions and the biweekly assignments will be assessed by the observations of the Teaching Assistant, by peer review, and by the student’s own reflections.
COURSE AND UNIVERSITY POLICIES:

CLASS ATTENDANCE: The University views class attendance as the responsibility of the student. Students will be assigned a time when they are required to attend the online laboratories, which will also be attended by the professor and teaching assistant. While attendance is not part of your assessment, your performance is directly related to your attendance- the more classes you miss the lower your grade tends to be. Students who miss class are responsible for getting the notes from a classmate. For more information on University Excused Absences please http://student-rules.tamu.edu.

Students seeking an excused absence on an exam day must notify the professor or the Department of Geography by the end of the next working day following the absence, as described in Texas A&M University Student Rules. For an absence considered excused by the university (http://student-rules.tamu.edu/rule7.htm), the student will be required to make-up the missed exam. At the instructor’s discretion, the make-up exam might be in a different format (i.e., essay instead of multiple choice) than the original exam.

EMAIL: All Texas A&M students should use their official TAMU email accounts when emailing the instructor or the teaching assistant. I may send out class announcements via the neo email system and it is your responsibility to check your account regularly.

THE AMERICANS WITH DISABILITIES ACT (ADA) The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu.

COPYRIGHT AND PLAGIARISM POLICY: All materials used in this class are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, http://student-rules.tamu.edu/, under the section "Scholastic Dishonesty."
HONOR SYSTEM AND ACADEMIC DISHONESTY: “An Aggie does not lie, cheat, or steal, or tolerate those who do.” Texas A&M has a Scholastic Dishonesty policy to which both students and faculty must comply. If you have any questions about the University’s Scholastic Dishonesty Policy, please review the Student Rules or see me. The Aggie Honor program is the new program that will handle all cases of academic dishonesty. The Aggie Honor program website is located at http://aggiehonor.tamu.edu