Texas A&M University

Core Curriculum

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 and 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 on 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.