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?

From droughts to flooding, severe storms to climate change, the behavior of the atmosphere has important impacts on both societies and individuals. In fact, weather affects every person, every day, around the world. Specific objective of the class include:

- To understand how the scientific method underpins research in atmospheric sciences.
- To understand typical meteorological products and data and make simple forecasts of weather conditions based on these tools.
- To be able to use your knowledge of atmospheric science principles to interpret the weather you experience every day.
- To provide the basis for assessing the implications of weather and climate variability on business, policy, and society.

**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 atmosphere is a complex physical system. To understand it requires an application of concepts from physics, math, and chemistry. Weather and climate have important impacts on human systems (e.g., drought conditions and fire danger, lightning and aviation safety, flooding and insurance.) Ideas from social sciences such as psychology, economics, and geography are also relevant to this course. Inquiry in atmospheric sciences requires the integration of concepts and ideas from a wide range of fields and the synthesis and evaluation of a range of data and models. Gains in critical thinking in the context of atmospheric sciences will be measured through student ability to answer higher-order, problem-based questions on tests.

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

Students will be asked questions daily (orally in class and in writing via quizzes, tests, or teaching technology devices) that synthesize material from the current or previous lecture. Students will ask questions during class to add depth and complexity to the lecture. Students will share and explain relevant weather stories, illustrated visually by appropriate pictures and maps, which will be displayed by the professor at the beginning of class. Samples of student writing and other work will be collected over the course of the semester and used to assess changes in communication skills.
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Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

Students will make basic mathematical calculations to understand concepts and physical laws fundamental to the atmosphere (e.g., how temperature changes with elevation or altitude, determining relative humidity, understanding the exponential increase in damage with increasing hurricane category). In their assignments students will be asked to routinely interpret maps and accompanying graphs of relevant weather variables, developing quantitative and communication skills simultaneously. These products will serve as evidence of student learning.

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 will interact with one another when questions are asked in class and during small-group activities. Students will work together on larger group projects. In these projects teamwork will be encouraged through the recognition of multiple points of view as students discuss how to evaluate sources of uncertainty in scientific understanding and the role of such uncertainties in operational weather forecasting. Student participation will be assessed by a teamwork rubric.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.