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 ocean covers 71% of the Earth's surface and therefore directly or indirectly affects most processes in the Earth System, including human activities. OCNG 251 Oceanography focuses on describing and explaining the major features and processes that occur in the ocean and how they interact with other components of the Earth System. For example, ocean currents help us to understand how heat energy is transferred from low to high latitudes, affecting global climate. A better understanding of the role of the oceans in the Earth system will help students become informed citizens capable of understanding environmental issues of societal importance, such as climate change and sea level rise. Information will be presented within the context of the scientific method. For example, the theory of plate tectonics will be presented to not only illustrate how this process has shaped the ocean basins, but also to illustrate how hypotheses develop and are tested, and how a theory is based on many empirical observations and types of evidence. Oceanography is an interdisciplinary and quantitative science; a goal of OCNG 251 is to integrate and synthesize knowledge and fundamental concepts from across the life and physical sciences to better understand the ocean.

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):

Critical thinking is integrated into the learning outcomes of OCNG 251 Oceanography. Students will be expected to use critical thinking to synthesize knowledge and concepts from several scientific disciplines to enable them to describe and explain processes in the ocean. Critical thinking will be tested during class as students will be expected to analyze, evaluate and interpret information (such as graphs, maps, diagrams, or table of data) while working in small teams and then communicate their findings to the rest of the class. Critical thinking will also be tested in four exams that take place during the semester.

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

Students will be required to communicate through writing and verbally to meet the learning outcomes of OCNG 251 Oceanography. Students will communicate their knowledge and the results of their critical thinking in writing during exams. During class, students will work in teams to analyze and evaluate information and they will communicate their results verbally to the rest of the class. In addition, informal discussions during class will develop students' rhetorical 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):

Empirical and quantitative skills are developed during OCNG 251. They are required to meet the learning objectives of the course and develop students’ understanding and application of the scientific method. Students will analyze and interpret data over a range of temporal and spatial scales. For example, an understanding of water properties and how they affect ocean circulation requires an integration of spatial scales from molecular to global. Students will analyze empirical data, such as changes in the fundamental oceanographic properties of seawater with depth. Students will use quantitative data to learn fundamental concepts by producing and interpreting graphical representations, make calculations and draw conclusions or make predictions based on their analysis.

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

Teamwork is an important element of modern science as major scientific problems are rarely solved by individual researchers. This is particularly true within the field of oceanography, which integrates physics, chemistry, geology, and biology to understand the ocean. OCNG 251 will address the teamwork core objective through group activities designed to meet the learning outcomes of the course. Students will work in small teams to analyze, evaluate, or interpret information at least every other class. In addition to taking the exams individually, students will take the exam in small teams which will develop communication and analytical skills in a group setting.

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