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?

Course topics will follow the Earth Science Literacy Principles, published by the Earth Science Literacy Project (http://www.earthscienceliteracy.org). This NSF-sponsored publication was developed in conjunction with every major geosciences professional society. The overall focus of the course is on understanding the functioning of Earth systems. A lab provides practical exposure to scientific reasoning and the scientific method as they are applied to geological problems.

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 will be integrated into each learning objective through lab activities allowing students to work with geological data. The lab will provide exercises requiring students to think critically about geological problems by 1) identifying data and areas of uncertainty, 2) distinguishing between data that are relevant and irrelevant to specific problems, and 3) logically testing hypotheses. Evaluation will be based on written lab reports and quizzes and graded using a rubric based on the Steps for Better Thinking Competency Rubric (Walcott, 2006; http://www.WolcottLynch.com). Lectures will provide examples of evidence-based reasoning providing the basis for major geological theories. Lab instructors will guide students through specific examples and provide feedback on exercises.

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

Communication will be integrated into each learning objective through lab discussions, debates, reports, and quizzes. The lab will provide exercises requiring students to communicate about geological problems by 1) organizing written and oral discussions in order to emphasize relevant data and provide a logical flow to a well-supported conclusion, and 2) supporting written text with well-chosen diagrams or illustrations. Evaluation will be based on debates and written lab reports and quizzes. Students will be supplied with examples of excellent, satisfactory, and poor geological writing and asked to compare with their own writing.

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

Empirical and quantitative skills will be integrated into each learning objective through lab reports and quizzes. The lab will provide exercises requiring students to use empirical and quantitative skills to solve geological problems by 1)
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

constructing and analyzing graphs, 2) describing three-dimensional structures or surfaces from two-dimensional representations (e.g. maps or projections), and 3) identifying patterns or trends from historical data. Lectures will regularly include examples of graphs, maps, and historical data.

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 will be integrated into many learning objectives through group lab exercises. The lab will provide several exercises requiring students to work in teams to solve geological problems by 1) recognizing different points of view, 2) designing and executing plans to test or reconcile opposing hypotheses, and 3) identifying and reporting areas of uncertainty that prevent consensus.

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