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?

This course focuses on the physical, chemical, and biologic changes that have taken place on Earth since its formation 4.6 billion years ago. Particular emphasis will be placed on the biosphere and how scientists use the fossil record to help reconstruct Earth’s past. Students will see how the scientific method is applied to reconstruct the past and will have numerous opportunities to engage in geologic inquiry. The scientific method is applied in laboratory exercises to interpret past Earth surface conditions and reconstruct the sequence of events in Earth history.

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 skills will be emphasized in all graded lab activities. In particular, students will interpret depositional environments based on observations of sedimentary rocks and fossils. Students will analyze radiometric measurements to identify outliers when estimating geologic ages. Students will assess cause-and-effect feedbacks in Earth history using data from the rock record.

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

Communication skills will be emphasized in all graded lab activities and in oral group presentations. Students will present Earth history using distance as a metaphor for geologic time. Students will build phylogenetic trees showing the evolutionary relationships among biological lineages. Students will diagram the distribution of time in a stratigraphic cross-section using Wheeler diagrams. Students will display quantitative radiometric age data as scatterplots with all units and quantities clearly labeled. Students will orally present and defend group stratigraphic interpretations to the class.

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

Students will develop and test interpretations of ancient depositional environments from sedimentary rocks and fossils in the laboratory and in the field. Students will use geologic materials to construct and interpret geologic maps. Students will construct stratigraphic cross-sections based on correlation of geologic successions from multiple locations. Students will construct cladograms depicting the degree of evolutionary relatedness of different organisms.
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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 measure and describe a stratigraphic succession in the field as a group; they will present and defend their interpretation to the class. Students will develop and test competing hypotheses to explain the properties of sedimentary rocks as a group in lab; they will present a scientifically defendable consensus interpretation.

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