Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2016 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.

The proposed course must contain all elements of the Foundational Component Area. How does the proposed course specifically address the Foundational Component Area definition above?

Since geology is a science that is particularly dependent on understanding the evolution of three-dimensional structures and on the physical nature of natural samples (rocks, minerals, fossils), Geology 102 is a hands-on laboratory course designed to introduce students to the scientific method and the physical and chemical nature of the Earth using teaching aids, real-world data sets and quantitative exercises.

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.

The proposed course is required to contain each element of the Core Objective.

Critical Thinking (to include creative thinking, Innovation, inquiry, and analysis, evaluation and synthesis of information):

Students will think critically about geological problems by 1) distinguishing relevant data for a specific problem 2) identifying areas of uncertainty, and 3) logically testing hypotheses. Exercises require students to apply fundamental principles to solve real world problems through observation of natural Earth materials and interpretation of data sets, geologic maps and three-dimensional drawings of the subsurface

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

Students 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. Visual communication is a critical part of the geologic sciences. Exercises require students to visualize Earth structures and materials in two and three dimensions, as well as how they move and deform through time. Students will visually communicate three-dimensional objects in two-dimensional planes (maps).

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

Students will solve quantitative geological problems by 1) constructing and analyzing graphs (e.g., phase diagrams or stream profiles), 2) describing three-dimensional structures or surfaces from two-dimensional representations (e.g. maps or projections), and 3) identifying patterns or trends from data.
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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 collaborate in small groups to synthesize real-world data to solve geological problems (e.g., development of theory of plate tectonics; strategies for hazard mitigation and sustainable resource use). Group work requires them to communicate (oral, written and visually), learn from each other’s knowledge and consider different perspectives in order to reach consensus on conclusions.

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