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?

Biology 101 is an introductory botany course that covers the anatomy, development, physiology, reproduction, genetics, evolution, and diversity of algae and non-vascular and vascular plants. The development of agriculture and its effects on human society are explored, as well as human manipulation of plants. Weekly laboratory exercises focus on using the scientific method to reinforce and further explore lecture topics.

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 scientific method is the basis of both lecture and lab. Lectures present knowledge obtained from historical and current investigations and encourage students to consider ways in which this knowledge can be applied or furthered. Lecture exams assess students’ ability to analyze and think critically about information presented throughout the course. Laboratory exercises involve designing and performing experiments to test hypotheses and interpreting the data gathered. Detailed observation and comparison of organisms from single-celled algae to flowering plants, along with experiments with transgenic plants, contribute to an understanding of evolution and provide a framework for the discussion of emergent research in plant systematics and genetics. Lab assessments include lab reports, weekly quizzes, and a short research topic paper which is presented to the class.

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

Lab reports and quizzes require written and graphic interpretation of experimental results via discussion, graphs, tables, charts, and drawings. Laboratory sessions include question and answer sessions to reinforce learning. The final lab project involves writing a presentation, delivering it in front of the lab section, and facilitating discussion.

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

Lab exercises covering cell theory and division, plant development, heredity, enzymes, photosynthesis, respiration, protein synthesis, and transgenic plants involve the generation, analysis, and interpretation of exercise-specific data. Results are summarized in writing and/or tabular or graphic form for lab reports and quizzes. The plant diversity labs allow observation and analysis of variation in anatomy, physiology, and reproduction. Lab quizzes over the diversity labs emphasize recognition and analysis of features. Lectures and lecture exams invite the students to consider how research conclusions could be used to make decisions about land use, nutrition, transgenic plant development, etc.
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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):

The majority of the lab exercises require the students to work in groups to set up, run, and collect data on the experiments. Different groups or members of each group perform separate components of the lab exercise; the groups or group-members then interact to produce a set of group-compiled results. Each student subsequently uses the group-compiled results as the basis for his/her written lab assignment (in-class, homework or lab report). Teamwork is assessed by direct observation by the lab instructor and the assignment of appropriate participation points. During the interactive lab summaries students have the ability to consider different interpretations of the data and how these might yield different points of view.

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