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.

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?

Life and physical sciences focus on describing, explaining, and predicting natural phenomena using the scientific method. Biological Anthropology is among the most scientifically oriented endeavors within the Liberal Arts, focusing on rigorous data collection and hypothesis testing to advance our understanding of one of the core unifying principles of all life sciences: evolution. Biological anthropologists study living primates using well established wildlife research techniques. They examine, measure, and analyze the skulls, jaws, teeth, and skeletons of both modern humans and primates, as well as the fossil ancestors of these groups. Biological anthropologists investigate the DNA of living and fossil primates, and undertake research into the isotope chemistry underlying the diets of living and fossil primates. And, biological anthropologists are deeply involved in the forensic sciences. All of this research is undertaken with the aim of understanding and explaining the biological diversity of primates worldwide, including humans and our fossil ancestors. The ultimate goal is to better understand the complex interactions between climate/environment/ecology and human and primate populations, and how these external factors have influenced primate and human evolution. If we want to understand what makes us human, we must first recognize our primate heritage, as well as our deeper mammalian heritage. Only then can we grasp how the natural world has shaped our evolutionary history, and resulted in the diverse array of biological adaptations that characterizes modern Homo sapiens. Students receive detailed and integrated lectures in the classroom setting, as well as hands-on practical experience with conducting biological anthropological research in a weekly laboratory setting.

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):

Evolution is a controversial topic, in particular human evolution. In both the lecture and lab settings, students are encouraged to think critically about their preconceived ideas, religious or otherwise, and to reflect on how they know what they think they know. Within paleoanthropology, the study of human evolution, there is often controversy over the exact position of various fossil species in the line leading to humans. As a result, students are also challenged to think critically about the fossil evidence for human evolution presented to them, as well as the various interpretations of that evidence that scientists have made. In the labs, students are provided with various datasets for them to evaluate and analyze, and to use to develop their own understanding of what the various lines of evidence tell us. These include inquiries into the structure of the cell and DNA, genetic inheritance, evolutionary forces, and forensics, as well as measurements of bones, teeth, and fossils. The ultimate goal is to have the students develop a synthesis of human evolutionary history, and how it has been influenced by both extrinsic and intrinsic factors.
A major component of the scientific endeavor is the effective communication of ideas. In the classroom students are continually encouraged to raise questions or comments, with the goal of having them think critically about what they are being taught, and then articulate their thoughts in front of a group. In the labs, students are encouraged even more to formulate thoughts into coherent expressions, and to communicate these questions, and their answers, within a larger body of peers. Classroom examinations include written components that move far beyond multiple choice, and which require synthetic analysis of multiple components of the lectures; roughly half of each test is comprised of such long answer questions. Weekly lab assignments and reports require further development of effective visual and written communication, as students are required to analyze, evaluate and present visual representations of data and write lab reports in a coherent and thoughtful manner that conveys complex ideas in meaningful ways.

Students perform a weekly series of tasks as outlined in their lab manuals that provide them first-hand access to both numerical data and observable facts. The lab manual that we use includes a substantial number of datasets that students are required to manipulate and analyze. In addition, students create their own datasets from comparative dental, skeletal, and fossil materials available in the labs that they measure on their own. This hands-on approach provides students with direct access to original data that they can then work through on their own, or in groups, depending on the assignment. As a result, students obtain direct exposure to the data that underlies scientific interpretations, thereby gaining first-hand experience in conducting scientific research.

Several of the lab assignments require students to work in groups, both to collect and analyze data. These groups then present combined results that require a concerted effort to develop a consensus opinion. As a result, students learn to consider alternate points of view, and critically assess the evidence that underlies these differing perspectives. They work together toward a shared purpose, and even if they disagree with interpretations, they learn to appreciate why other people think the way that they do. Thus we are training students to become responsible colleagues and future effective collaborators or "team players."

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