

Detailed Assessment Report

As of: 5/08/2015 04:42 PM EDT

2014-2015 Biological and Physical Sciences BA & BS

(Includes those Action Plans with Budget Amounts marked One-Time, Recurring, No Request.)

Mission / Purpose

The mission the Biological and Physical Science (BIPH) program is to provide a broad background in the sciences, mathematics and informatics that is uniquely suited to a student's specific educational needs, and to prepare students for entrance/admission to professional programs (medicine, dentistry, optometry, etc.). The mission is consistent with the IU Kokomo Mission Statement.

Goals

G 1:Scientific Reasoning

Students will be able to reason scientifically.

G 2:Communicating Scientific Ideas

Students will communicate scientific ideas clearly and effectively.

G 3:Understand Basic Scientific Principles

Students will understand the basic principles of the biological sciences **OR** the physical sciences **OR** the mathematical sciences **OR** informatics.

Student Learning Outcomes/Components, with Any Associations and Related Artifacts/Objects, Benchmarks, Findings, and Action Plans

S 1:Understand the Nature of Scientific Truth

Outcome 1: Understand the nature of scientific truth

Component 1: Explain the of data collection and analysis in the development of scientific knowledge

Component 2: Explain the self-correcting nature of science

S 2:Application of Scientific Method

Recognize relationships among variables tested in a scientific experiment

S 3:Scientific Communication

Communicate in the scientific tradition

S 4:Outcome for Biology

Component 1: Explain similar/identical features of living systems

Component 2: Explain biodiversity

Component 3: Describe the cellular and molecular basis of genetics

Related Artifacts/Objects:

A 1:A1: BIOL-L105 Lab Exam

Goal 3, Outcome 2

As part of assessing student understanding on the mechanism behind biodiversity, students were assigned a video presentation on Darwin and how his observations about biodiversity led to his development of the theory of natural selection. Based on information in the video, students were given the exam question "How do humans assist in the variation of species?". Correct answers would reference selective breeding or artificial selection. Out of 40 students, 23 (57.5%) answered the question correctly, 9 (22.5%) partially answered the question, and 8 (20%) answered incorrectly. While the majority of students (80%) were either correct or demonstrated a partial understanding of the concept, our hope is that at least 70% will be able to answer the question completely correctly. We are looking to more explicitly reinforce concepts in both lecture and lab in order increase student understanding.

Source of Evidence: Written assignment(s), usually scored by a rubric

A 2:BIOL-L105 Lab Biodiversity Assignment

One of the lab activities in Introduction to Biology (BIOL-L105) is an examination of the basic characteristics of all animals and a survey in animal diversity. As part of the activity, students complete a series of questions based on information in the lab manuals and on what they examine on the provided models and specimens. Information students will be including on their worksheets includes providing 5 characteristics common to all animals, listing the classes of arthropods and mollusks, and completing a table comparing and contrasting the major worm phyla, Platyhelminth, Nematoda, and Annelida. The class averages on the in lab assignments are high: 11.11/12 (92.6%) in the Fall of 2012 and 11.7/12 (97.5%) in the Spring of 2013. This material is revisited on a subsequent exam. The exam average for both the fall and spring classes (weighted for class size) was 70% with the fall class having an average of 72.8% and the spring class having an average of 65%. While the performance on the exam meets the 70% threshold, there is a large difference between in class assignment scores and exam scores over what is ostensibly the same material. We are currently evaluating whether the in lab assignment is not rigorous enough or if the exam is not accurately reflecting what they are learning in the lab.

Source of Evidence: Written assignment(s), usually scored by a rubric

S 5:Outcome for Physical Sciences

Component 1: Explain the relationship between the structure of substances and their physical properties and reactivity at the molecular and atomic levels.

Component 2: Explain the interaction of the forces of nature, such as electromagnetism, gravity, and nuclear forces.

Component 3: Explain the unifying principle of plate tectonics and how it relates to the origin of Earth's physical phenomena, including rocks, volcanoes, and earthquakes.

S 6:Outcome for Mathematical Sciences

Component 1: Perform algorithmic and logical procedures

Component 2: Interpret the results of their computations

Component 3: Use appropriate technology

Component 4: Formulate a hypothesis and determine its validity

S 7:Outcome for Informatics

Component 1: Utilize computing terminology correctly

Component 2: Explain benefits/risks of technology reliance in society

Component 3: Use fundamental programming elements