

Draft: September 20, 2006

## **BA in BIOLOGICAL and PHYSICAL SCIENCES ASSESSMENT PLAN**

### **I. Program Mission**

The mission the Biological and Physical Science (BIPH) program is to provide a broad background in the mathematical and natural sciences 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.

### **II. Program Goals/ Student Learning Outcomes/Components**

**Goal #1:** *Students will be able to reason scientifically.*

#### **Outcome #1. Understand the nature of scientific truth**

Component #1. Explain the role of data collection and analysis in the development of scientific knowledge

Component #2. Explain the self-correcting nature of science

#### **Outcome #2. Recognize relationships among variables tested in a scientific experiment**

Component #1. Collect meaningful data from an experiment

Component #2. Apply mathematical techniques to analyze collected data using current technology

Component #3. Apply statistical methods to evaluate experimental data

Component #4. Draw relevant conclusions from experimental results

**Goal #2:** *Students will communicate scientific ideas clearly and effectively.*

#### **Outcome #1. Communicate in the scientific tradition**

Component #1. Utilize scientific terminology correctly

Component #2. Express the results of scientific work clearly and concisely

Component #3 Explain the solutions to problems using correct mathematical vocabulary and mathematical notation

**Goal #3:** *Students will understand the basic principles of the biological sciences OR the physical sciences OR the mathematical sciences.*

#### **Outcome for Biology. Students will be able to describe the unifying principles of biology**

Component #1. Explain similar/identical features of living systems

Component #2. Explain biodiversity

Component #3. Describe the cellular and molecular basis of genetics

**Outcome for the Physical Sciences. Students will understand phenomena that govern the physical universe**

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

**Outcome for the Mathematical Sciences. Students will be able to formulate and solve problems mathematically**

Component #1. Perform algorithmic and logical procedures

Component #2. Interpret the results of their computations

Component #3. Use appropriate technology

Component #4. Formulate an hypothesis and determine its validity

**III. Curriculum map** (where in curriculum student learning outcomes occur) [See attachment]

**IV. Assessment of student learning activities planned for the following academic year**

A. The student learning outcome the Biological and Physical Sciences Major plans to assess during the following academic year.

**Goal #: X.**

**Outcome #: X.**

B. Identify approximately when, where (e.g., in which courses), and how (i.e., through what activity) students will demonstrate their achievement of the outcome. XXX

C. For each component of the outcome assessed, describe the performance characteristics or criteria necessary for successful achievement.

**Goal #X.**

**Outcome #X.**

**Component #X.**

Good:

Fair:

Inadequate:

**Component #X.**

Good:

Fair:

Inadequate:

D. Indicate a benchmark, that is what level of performance will be considered acceptable (e.g., 85% of students will demonstrate satisfactory achievement of this outcome).

**V. Ongoing Assessment**

A. Describe the status of your larger program assessment plan (primarily sections H and III) -

B. If incomplete, give an estimated time line for completing the plan.

C. Describe any resources (e.g., training materials) that would be helpful to you in carrying out your planned assessment activities.