

**School of Sciences**  
**Chemistry/Biochemistry (B.A./B.S.) Assessment (2020-2025)**

I. Mission statement

**I. Introduction and mission statements**

The Bachelor of Science degrees in Chemistry and Biochemistry are currently offered within the IU Kokomo School of Sciences. The Biochemistry degrees were initiated in the fall of 2012 and implemented concurrently with BA in Chemistry that has been initiated in 2006. Equivalent BS degrees are also offered at other IU campuses. The programs were originally created at IUB and IUPUI.

***Mission Statement:*** The Bachelor of Science degrees in Chemistry and Biochemistry are designed to provide students with the background needed for science-related industrial and academic positions, for entry into chemistry graduate programs or professional programs (such as medicine, veterinary, dentistry, optometry) and, if coupled with the appropriate graduate certificates in secondary education, the graduates will be capable of teaching high school chemistry. The mission is consistent with the IU Kokomo Mission Statement.

**II. Program goals and learning outcomes**

**Student Learning Outcomes and Components:**

**Goal I:** Knowledge and understanding of the theoretical basis of chemistry.

Outcome 1: Students will be able to connect observations with prior information.

Components:

1. Prediction of chemical reaction products
2. Identification of chemical reaction products

Outcome 2: Students will be able to explain the physical and chemical properties of substances based on an understanding of atomic and molecular structure.

Components:

1. Explanation of physical properties
2. Explanation of chemical properties

Outcome 3: Students will perform quantitative calculations using experimental data.

Components:

1. Selection of an appropriate theoretical relationship/equation for data analysis.
2. Completion of quantitative calculations

3. Explanation of the significance and/or validity of the results.

## **Goal II: Laboratory Work and Performance**

Outcome 4: Students will demonstrate the understanding and ability to carry out laboratory procedures effectively and safely.

Components:

1. Explanation of the purpose of the steps in a laboratory procedure.
2. Use of standard laboratory equipment and instrumentation properly and safely.

Outcome 5: Students will collect, analyze, and draw relevant conclusions from experimental data.

Components:

1. Collection and organization of relevant data.
2. Analyze experimental data appropriately.
3. Interpretation of processed data.
4. Identification of experimental errors.

Outcome 6: Design procedures appropriate to the goal of an investigation.

Components:

1. Selection of a suitable experimental approach.
2. Modification of the approach to optimize the experimental outcome.

## **Goal III: Application of Quantitative Reasoning Skills and Critical Thinking to Problem Solving**

Outcome 7: Students will learn to organize relevant information for analysis.

Components:

1. Identification of critical data elements necessary to understand the problem
2. Identification of applicable theories and/or mathematical relationships

Outcome 8: Students will calculate quantitative values and/or formulate an explanation of observations.

Components:

1. Application of theories to illustrate how observations can be understood
2. Application of equations to determine mathematical values with appropriate significant figures and units

Outcome 9: Students will draw conclusions from quantitative values and/or experimental observations.

Component:

1. Correlation of quantitative results to chemical and/or physical properties of the system.