

Program: Biochemistry

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Intended Outcome: SLO 1: Demonstrate comprehensive knowledge of the key principles of biochemistry; using a strong foundation in the disciplines of chemistry.

Means of Assessment: 1. END OF PROGRAM ASSESSMENT. Oral presentations of advanced topics in biochemistry and completion of portfolio in Chemistry 490, the capstone course. 2. The following SLOs were assessed in Chemistry 232, Organic Chemistry I: Analyze the conformations of linear and cyclic molecules especially in regard to relative energy between two molecules, Correlate a given compound's structural elements to chemical or physical properties, and Analyze the structures of reacting molecules to predict the products with correct regio-and stereochemistry. 3. Five SLOs were assessed in Chemistry 233, Organic Chemistry II. They included describing reactions of various types of organic compounds, explaining the outcome of a chemical reaction using an appropriately drawn mechanism, proposing chemical synthetic schemes, understanding aromaticity, and interpreting spectroscopic data. 4. Eight SLOs were assessed in a section of Chemistry 113, General and Analytical Chemistry. They include calculations of gas properties, evaluation of intermolecular forces based on structure of a substance and determination of the properties arising from the forces, calculations using rate laws, calculations using general, acid-base and solubility equilibrium constants. 5. Six to seven SLOs were measured in 22 sections of Chemistry 113 (152 SLOs total). They included calculations of gas laws, concentration units, and equilibrium constants; construction and interpretation of a graph using computer software; defining and identifying acids and bases; drawing and understanding geometric isomers; and safety.

Type of Assessment: Other

Criteria for Success: 1. Students score 3 or higher on rubric scale (1-4) in the following rubric categories for their final presentation in the capstone course: Subject Knowledge (background), Subject Knowledge (questions), and Organization. 2. 60% of students answer questions correctly. 3. Two-thirds of class score in highly competent or moderately competent categories (> 90% and 60-90%, respectively). 4. 70% 5. 75% successful completion.

Results or Progress: 1. 100% of students scored 3 or higher in Subject Knowledge (background), Subject Knowledge (questions), and Organization. Mean scores ranged from 81-96% 2. Percentage of students answering questions correctly are 76%, 68%, and 70%, 3. Three categories met goal (70-85%). Two categories did not meet goal (33% and 63%). respectively. 4. Five categories met goal (70-82%). Three did not meet goal (60-68%). 5. 83.6% met 75% successful completion.

Use of Results for Improvement: 1. Goal met. 2. Goals met. Plans for improvement are to include worksheets and consideration of use of decision trees for predicting reactions. 3. Provide students with more practice problems and work more problems in class. 4. Spend more time in class on equilibrium and kinetics calculations. 5. Devise an EXCEL instruction sheet; include a videoclip on the CHEM 113L course website that discusses in greater detail the types of isomers present in coordination complexes and the identification of these isomers.

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Intended Outcome: SLO #3--Proficiently record, analyze, and disseminate data utilizing chemical instrumentation and software.

Means of Assessment: 1. In Chemistry 330L (advanced organic chemistry, research track), the following outcomes were assessed: Use NMR spectrometer to obtain spectra for identifications and molecules and Use proper notebook procedures to document all experiments. 2. In Chemistry 370L(Instrumental Analysis), the following outcomes were assessed: Students will prepare standards of a given concentration in a variety of solvents and Students will use calibration curves generated from standards to determine concentrations of analytes in samples. 3. Six to seven SLOs were measured in 22 sections of Chemistry 113 (152 SLOs total). They included calculations of gas laws, concentration units, and equilibrium constants; construction and interpretation of a graph using computer software; defining and identifying acids and bases; drawing and understanding geometric isomers; and safety.

Type of Assessment: Other

Criteria for Success: 1. Mean scores of 60% and 70%, respectively. 2. 75% successful completion (4.5/5) of each SLO assessed. 3. 75% successful completion.

Results or Progress: 1. Mean assessment for each goal were 7.9/10 and 7.3/10, respectively. 2. 84% of students received 4.5/5 or greater. 3. 83.6% met 75% successful completion.

Use of Results for Improvement: 1. Goals met. 2. Goals met. 3. Devise an EXCEL instruction sheet; include statement in syllabus prohibiting use of cell phones in lab (safety).