

Assurance of Student Learning Reflection 2024-2025

Ogden College of Science and Engineering

Department of Chemistry and Biochemistry

Biochemistry, 519

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Is this an online program? ☐ Yes ☒ No

Please make sure the Program Learning Outcomes listed match those in CourseLeaf. Indicate verification here
☒ Yes, they match! (If they don't match, explain on this page under **Evaluation**)

Instructions: For the 2024-25 assessment, we are asking you to reflect on the last three-year cycle rather than collect data. It's important to take time to look over the results from the last assessment cycle and really focus on a data-informed direction going forward. In collaboration with your assessment team and program faculty, review each submitted template from 2021-2024 and consider the following for each Program Learning Outcome, add your narrative to the template, and submit the draft to your **ASL Rep** by **May 15, 2025**.

Program Student Learning Outcome 1

Program Student Learning Outcome	Communicate effectively in written form
Evaluation	All biochemistry majors must take the course (CHEM 447) that is being evaluated, and the course requires a written paper in lieu of a traditional lab final. Thus, it is an appropriate place to evaluate writing quality.
Measurement Instruments	We are using an AACU rubric for writing quality, and thus we feel this is a valid method for measuring writing quality. We have found that typically 90-100% of students meet the criteria of an average of 2.6, and thus increasing the average seems appropriate for future cycles.
Criteria & Targets	Our criteria have included the expectation that 75% of students will score 2.6 or higher. With a higher target score of 2.8, we would not always have seen this criteria be met, as one year we had several that were in the 2.4-2.6 range. We feel that increasing the target score to 2.8 would be appropriate.
Results & Conclusion	We expect students who are in a 400-level lab to have good writing skills, so the results have been expected. However, since this is one of the primary places to assess writing, it is appropriate to continue to assess writing quality and to adjust the writing project if necessary should we see evidence that writing quality is diminishing.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	We will continue to assess the quality of writing through the protein paper in CHEM 447, though with a higher threshold for success since we have seen consistent achievement of the criteria. Should we notice a decline in the writing quality, we will consider altering the assignment in a way that will provide remediation and instruction on writing quality.

Program Student Learning Outcome 2	
Program Student Learning Outcome	Interpret and explain data about chemical systems
Evaluation	This program learning outcome is still relevant. It is essential that students in a biochemistry major be able to interpret relevant data.
Measurement Instruments	Since all biochemistry majors are required to take Quantitative Analysis, the ACS final exam score has been used as a measurement instrument. This is a somewhat indirect measurement, though analysis of data is a key component of the course. Having a standard exam provides a nationally-normed standard by which to measure, which is a positive.
Criteria & Targets	We have consistently met the criteria, but only by a narrow margin. We believe the criteria and targets continue to be at an acceptable level.
Results & Conclusion	Our majors are typically able to interpret data well, so we expect to see success in this outcome. The course is often taken in the junior year for biochemistry majors, so this assessment provides us with an opportunity to measure their ability to interpret data in the later part of their undergraduate program.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	Since the course has recently changed instructors, we will continue to assess this outcome by the same metric and with the same criteria. Once we have collected data for a few years, we will re-evaluate and see if we need to adjust this metric by selecting specific questions from the final exam to get more direct measurement of our outcome.

Program Student Learning Outcome 3	
Program Student Learning Outcome	Describe and discuss structure-property-function relationships for a variety of molecules
Evaluation	Structure-function relationships are vital to an understanding of biochemistry, so this outcome is an essential aspect of our program.
Measurement Instruments	The CHEM 342 (Organic II) course is required for biochemistry majors and is usually taken at the sophomore/junior level. Since the organic chemistry course is focused on smaller molecules than biochemistry, this is an indirect measurement of the students' understanding of structure-function in general. However, since all biochemistry majors take CHEM 342 and at least one semester of organic is a pre-requisite to the biochemistry sequence, we believe this is a valid place to assess their understanding of the concept.
Criteria & Targets	In the last three years, students have failed to meet this criteria; we have noted a decrease from previous cycles. Since the students in this cycle would have been in high school or college during the height of the pandemic, these results may be temporary.
Results & Conclusion	In past cycles, students have had higher scores on the ACS final exam in Organic Chemistry, so our results were somewhat unexpected. We feel that continuing to assess this as we get past the pandemic effects on education is important.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	We will continue to collect data for a few more years to determine if the decrease in scores continues. We will then consider whether switching to answers on select questions provides a better assessment of structure/function relationships that are relevant to biochemistry.

