

## Program-Level Assessment: Annual Report

Program Name (no acronyms): Chemical Biology & Pharmacology

Department: Chemistry

Degree or Certificate Level: BS

College/School: College of Arts & Sciences

Date (Month/Year): August 2023

Assessment Contact: Chris Arnatt

In what year was the data upon which this report is based collected? 2022-2023

In what year was the program's assessment plan most recently reviewed/updated? New program approved in 2018, Program assessment feedback 2023

### 1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle? (Please list the full, complete learning outcome statements and not just numbers, e.g., Outcomes 1 and 2.)

SLU graduates with a BS degree in Chemical Biology & Pharmacology will be able to:

- 1. Explain major principles in organic chemistry, biochemistry, and pharmacology**
- 2. Conduct laboratory techniques and experiments safely**
3. Analyze quantitative data
4. Apply chemistry principles to biology
5. Articulate scientific results in both oral and written forms

Learning outcomes highlighted in **BOLD font** were assessed in this annual cycle.

This is the fourth year for the program. In Year 1, learning outcomes 1 and 2 were evaluated. In Year 2, outcomes 3 and 4 were evaluated. In Year 3, outcome 5 was evaluated. In year 4, outcomes 1 and 2 are evaluated.

### 2. Assessment Methods: Artifacts of Student Learning

Which artifacts of student learning were used to determine if students achieved the outcome(s)? Please describe and identify the course(s) in which these artifacts were collected. Clarify if any such courses were offered a) online, b) at the Madrid campus, or c) at any other off-campus location.

For **Outcome 1**, ACS standardized organic chemistry and biochemistry exams was used to assess (CHEM 2440 and CHEM 4620). In addition, select exam questions (written) CHEM-4470 and PPY-4410 are used to gauge student mastery of this outcome.

For **Outcome 2**, the results from a safety quiz normally given in CHEM 2445 (organic chemistry 2) were used. Lab notebooks from CHEM 4625 (biochem lab 2) were used. In addition, the final grade for CHEB 3970 (undergrad research) was used.

Madrid does not have a program in Chemical Biology.

No courses in this assessment were offered online or off-campus.

### 3. Assessment Methods: Evaluation Process

What process was used to evaluate the artifacts of student learning, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and **include them in/with this report document** (do not just refer to the assessment plan).

Data was collected by course instructors and is summarized on the attached spreadsheet.

Data was analyzed by the Chemical Biology Program Coordinator and reported to department faculty for feedback.

#### 4. Data/Results

What were the results of the assessment of the learning outcome(s)? Please be specific. Does achievement differ by teaching modality (e.g., online vs. face-to-face) or on-ground location (e.g., STL campus, Madrid campus, other off-campus site)?

For Outcome 1: 3 out of 4 students exceeded expectations and 1 out of 4 students met expectations in CHEM 2440. 2 out of 5 students exceeded expectations, 2 out of 5 students met expectations, and 1 out of 5 students did not meet expectations in CHEM 4620. 1 out of 5 students exceeded expectations and 4 out of 5 students met expectations in CHEM 4470. 4 out of 5 students exceeded expectations and 1 out of 5 students met expectations in PPY4410.

For Outcome 2: 1 out of 4 students exceeded expectations and 3 out of 4 students met expectations in CHEM 2445. 2 out of 4 students exceeded expectations and 2 out of 4 students met expectations in CHEM 4625. 12 out of 14 students exceeded expectations, 1 out of 14 students met expectations, and 1 out of 14 students approached expectations in CHEM 3970.

#### 5. Findings: Interpretations & Conclusions

What have you learned from these results? What does the data tell you?

Based on our analysis, our BS students are generally exceeding or meeting expectations. There was a student in CHEM4620 and CHEM3970 that did not meet or was approaching expectations, but both of these are outliers when considering the vast majority of the students exceeding or meeting expectations.

#### 6. Closing the Loop: Dissemination and Use of Current Assessment Findings

A. When and how did your program faculty share and discuss these results and findings from this cycle of assessment?

The results of the assessment were shared with the full faculty via email. The collection and analysis of the data was completed just prior to finalizing this report. The data and the first draft of this report was shared with the instructors of the courses related to the above outcomes.

B. How specifically have you decided to use these findings to improve teaching and learning in your program? For example, perhaps you've initiated one or more of the following:

Changes to the Curriculum or Pedagogies

- Course content
- Teaching techniques
- Improvements in technology
- Prerequisites

- Course sequence
- New courses
- Deletion of courses
- Changes in frequency or scheduling of course offerings

Changes to the Assessment Plan

- Student learning outcomes
- Artifacts of student learning
- Evaluation process

- Evaluation tools (e.g., rubrics)
- Data collection methods
- Frequency of data collection

Please describe the actions you are taking as a result of these findings.

This is our second time assessing these outcomes using these metrics. No changes are being made with respect to these two outcomes due to our students exceeding or meeting our expectations.

If no changes are being made, please explain why.

Generally speaking, there are no major concerns given that ~95% of our students are meeting or exceeding expectations.

**7. Closing the Loop: Review of Previous Assessment Findings and Changes**

**A.** What is at least one change your program has implemented in recent years as a result of assessment data?

No specific changes to the program have been made as this is only the fourth year of the program.

**B.** How has this change/have these changes been assessed?

n/a

**C.** What were the findings of the assessment?

n/a

**D.** How do you plan to (continue to) use this information moving forward?

Rubrics will be used to collect data annually so that we can assess larger sample sizes (3 year's worth of data) in the coming years when the outcome(s) are scheduled for review.

**IMPORTANT: Please submit any assessment tools (e.g., rubrics) with this report as separate attachments or copied and pasted into this Word document. Please do not just refer to the assessment plan; the report should serve as a stand-alone document.**

**Course Performance - BS Students****Academic Year 2022-2023****Program Year 4****Assessment Cycle: Year 3**

Year 1: Learning outcomes 1 and 2

Year 2: Learning outcomes 3 and 4

Year 3: Learning outcome 5

Year 4: Learning outcomes 1 and 2

Outcome 1: Explain major principles in organic chemistry, biochemistry, and pharmacology							
Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total	Assesment	Notes
CHEM 2440 Organic Chem	3	1			4		Taken from Spring 2023
CHEM 4620 Biochemistry	2	2		1	5		Taken from Spring 2023
CHEM 4470 Med Chem	1	5			6		Taken from Spring 2023
PPY 4410 Molec Pharm	4	1			5		Taken from Spring 2023

Outcome 2: Conduct laboratory techniques and experiments safely							
Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total		Notes
CHEM 2445 Org Chem 2 Lab	1	4			5		Taken from Spring 2023
CHEM 4625 Biochem 2 Lab	2	2			4		Taken from Spring 2023
CHEB 3970 Undergrad Research	12	1	1		14		Taken from Fall 2022 and Spring 2023