SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program: Chemical Biology	Department: Chemistry
Degree or Certificate Level: MS	College/School: Arts & Sciences
Date (Month/Year): June 2020	Primary Assessment Contact: Marvin Meyers
In what year was the data upon which this report is based collected? 2019-2020	
In what year was the program's assessment plan most recently reviewed/updated? New program approved 2018	

1. Student Learning Outcomes

Which of the program's student learning outcomes were assessed in this annual assessment cycle?

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

SLU graduates with a MS degree in Chemical Biology will be able to:

Outcome 1: Assess relevant literature in chemical biology

Outcome 2: Apply the major practices, theories, or research methodologies in chemical biology.

Outcome 3: Apply chemistry principles to biology.

Outcome 4: Articulate arguments or explanations in both oral and written forms.

Outcome 5: Evidence scholarly and professional integrity in chemical biology.

This is the first year for the program. In Year 1, learning outcomes 1 (course-based assessment only) and 3 are evaluated. In Year 2, outcomes 2 and 4 are evaluated. In Year 3, outcomes 1 (thesis-based assessment only) and 5 are evaluated.

2. Assessment Methods: Student Artifacts

Which student artifacts were used to determine if students achieved this outcome? Please 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**, performance on a class project/presentation was collected. Assessment data was in the form of a rubric from the course instructor. For this outcome, one course had multiple students enrolled, CHEM 5470 Medicinal Chemistry. CHEB-5630 was not offered this year and therefore not included in the assessment. As no students completed their degree this year, thesis-based assessments were not conducted this cycle.

For **Outcome 3**, select exam questions (written) in CHEB-5630 and CHEM-4470 are normally to be used to gauge student mastery of this outcome. CHEB-5630 is only offered every other year; it was not offered this year, so is excluded in this analysis. Due to course modifications due to moving online with the COVID-19 situation, CHEM-4470 did not utilize short answer questions on the final exam. Therefore, the final exam score was used for this assessment.

Madrid does not have a graduate program in Chemical Biology.
No courses in this assessment were offered online or off-campus. The exception to this was due to the mid-semester Spring 2020 modification to CHEM 5470 to an online form due to COVID-19.

3. Assessment Methods: Evaluation Process

What process was used to evaluate the student artifacts, and by whom? Please identify the tools(s) (e.g., a rubric) used in the process and include them in/with this report.

> Data was collected by course instructors and is summarized on the attached spreadsheet. The rubric used for source data is attached as well.
>
> Data was provided to Department's Assessment Committee.

4. **Data/Results**

What were the results of the assessment of the learning outcomes? 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 of 3 students exceeded expectations (>90%) on the CHEM 5470 research paper rubric.
>
> For Outcome 3: 3 of 3 students exceeded expectations (>90%) on the CHEM 5470 final exam score.
>
> It should be noted that this is the first year of the program and the number of MS students is small, which may skew the results.

5. **Findings: Interpretations & Conclusions**

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

> Based on our analysis, our MS students are exceeding expectations, although we were limited in our assessment this year due to course offerings.

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?

> This is our first year assessing these outcomes using these metrics. The results of the assessment will be shared with the full faculty during our annual department retreat later this summer. Additional actions may be proposed at that point.

B. How specifically have you decided to use 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
- Student artifacts collected
- 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 the findings.

> This is our first year assessing these outcomes using these metrics. Upon approval of the Chemical Biology Program, specific learning outcomes and assessments were approved but not all rubrics have been developed yet. Challenges faced due to the COVID-19 situation delayed developing all of the rubrics. We will be working developing these rubrics to over the upcoming year.

If no changes are being made, please explain why.

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?

> N/A – this is the first year of the program.

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

C. What were the findings of the assessment?

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

IMPORTANT: Please submit any assessment tools and/or revised/updated assessment plans along with this report.

Course Performance - MS Students
Academic Year 2019-2020
Program Year 1

Assessment Cycle: Year 1
Year 1: Learning outcomes 1 (course-based) and 3
Year 2: Learning outcomes 2 and 4
Year 3: Learning outcomes 5 and 1 (thesis-based

Outcome 1: Assess relevant literature in chemical biology

Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total	Assessement	Notes
CHEB 5630 rubric						N/A	Course not offered this year
CHEM 5470 rubric	3				3	100% exceeds expectations	course rubric for research paper
MS Thesis rubric							not assessed this year; also no graduating students this year

Outcome 2: Apply the major practices, theories, or research methodologies in chemical biology.

Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total		
MS Thesis rubric							

Outcome 3: Apply chemistry principles to biology.

Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total		Notes
CHEB 5630 exam Qs						N/A	Course not offered this year
CHEM 5470 exam Qs	3				3	100% exceeds expectations	Due to COVID-19 course modifications, no short answer questions were given. Rather final exam score was used for assessment

Outcome 4: Articulate arguments or explanations in both oral and written forms.

Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total		Notes
MS Thesis rubric							

Outcome 5: Evidence scholarly and professional integrity in chemical biology.

Data Source	>90% - Exceeds Expectations	70 - 89% - Meets Expectations	65 - 69% - Approaching Expectations	<65% - Not meeting expectations	Total		Notes
CHEB 5110 ethics module							

CHEM-5470 Research Paper Rubric

Name _____

Standards		5 - 4 Exemplary	3 - 2 Satisfactory	1 - 0 Weak	Score	Weight	Total Score
Introduction		Provides background research into the topic and summarizes important findings from the review of the literature; describes problem to be solved; explains the significance of the problem to an audience of non-specialists	Provides background research into the topic and describes the problem to be solved	Provides background research into the topic but does not describe the problem to be solved; insufficient or nonexistent explanation of details to non-specialists		x 3	
Discussion	Integration of Knowledge	Discusses at least four topics covered during the course. Demonstrates full understanding and application of concepts learned in course. Chemical detail of structures and discussion is accurate.	Discusses three topics covered during the course. Demonstrates satisfactory understanding and application of concepts learned in course. Chemical detail of structures and discussion are mostly accurate.	The paper does not demonstrate that the author has fully understood and applied concepts learned in the course.		x 4	
	Depth	Paper presents a complete story of the discovery of the selected drug, including medical need, biological target or assay, medicinal chemistry optimization, and development.	Paper presents a partial story of the discovery of the selected drug.	Incomplete coverage of discovery.		x 4	
	Cohesiveness	Addresses the topic with clarity; organizes and synthesizes information; and draws conclusions	Addresses the topic; lacks substantive conclusions; sometimes digresses from topic of focus	Presents little to no clarity in formulating conclusions and/or organization		x 4	
Summary		Presents a summary of the topic with clear recommendations and/or implications for future research	Presents a summary of the topic	Missing or does not summarize the topic		x 3	
Mechanics and documentation		Is free or almost free of errors of grammar, spelling, and writing mechanics; appropriately documents sources (ACS style)	Has errors but they don't represent a major distraction; documents sources	Has errors that obscure meaning of content or add confusion; neglects important sources or documents few to no resources		x 2	
Comments					Grand Score (max 100)		