SAINT LOUIS UNIVERSITY.

Program-Level Assessment: Annual Report

Program Name (no acronyms): Chemistry MS   Department: Chemistry

Degree or Certificate Level: Graduate   College/School: Arts and Sciences

Date (Month/Year): August 2021   Assessment Contact: Scott Martin and Dana Baum

In what year was the data upon which this report is based collected? 2020-2021

In what year was the program's assessment plan most recently reviewed/updated? 2018

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.)

Outcome 1: Demonstrate advanced level knowledge in both (i) synthesis and materials chemistry and (ii) analytical and physical chemistry methods, with a higher level of knowledge expected in the student's area of focus.

Outcome 3: Communicate scientific findings from literature and original findings from the student's own advanced research in written publications and oral presentations.

Outcome 4: Apply learned chemical practices and theories to proposed problems.

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 Outcomes 1 and 4, course performance as determined by final grade was collected. 1 course from each semester was used for assessment. Courses with the highest enrollment for MS students were chosen for assessment.

Courses: CHEM 5470 – Medicinal Chemistry for synthesis and materials chemistry; CHEM 5260 – Analytical Separations for analytical and physical chemistry methods.

For Outcome 3, we used MS student theses.

Madrid does not have a graduate program in Chemistry.

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).

For Outcomes 1 and 4: Criteria used for assessment was as follows based on the final score in each class:

>90% Exceeds expectations

70 - 89% Meets expectations

65 - 69% Approaching expectations

<65% Not meeting expectations

Instructors for courses were asked to provide the number of students that fell into each of the above categories. Data was provided without names.

For Outcome 3: A rubric was provided to each MS student's advisor. Rubric is provided as an appendix. Data was provided without names.

Data was reviewed by the Department's Assessment committee.

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, all of our MS students are meeting or exceeding expectations. Two MS students were enrolled in CHEM 5470, with 1 exceeding expectations and 1 meeting expectations. 11 MS students were enrolled in CHEM 5260, with 8 exceeding expectations and 3 meeting expectations. For Fall 2020, flex enrollment was an option and students attended either in person or virtually as needed, meaning their modality could change each week. Spring 2021 courses were in person. Thus, we cannot assess the effect of modality. All graduate courses are through the SLU campus.

For Outcome 3, 5 students were assessed for their MS thesis. Score breakdown based on the rubric is provided:

	Thesis Format	Background Knowledge	Presentation	Written Communication
Student 1	Good	Fair	Good	Fair
Student 2	Excellent	Excellent	Excellent	Excellent
Student 3	Excellent	Good	Excellent	Excellent
Student 4	Excellent	Excellent	Excellent	Excellent
Student 5	Excellent	Good	Good	Good

For Outcome 4, all of our MS students are meeting or exceeding expectations. Two MS students were enrolled in CHEM 5470, with 1 exceeding expectations and 1 meeting expectations. 11 MS students were enrolled in CHEM 5260, with 8 exceeding expectations and 3 meeting expectations. For Fall 2020, flex enrollment was an option and students attended either in person or virtually as needed, meaning their modality could change each week. Spring 2021 courses were in person. Thus, we cannot assess the effect of modality. All graduate courses are through the SLU campus.

5. Findings: Interpretations & Conclusions
What have you learned from these results? What does the data tell you?

Overall, our MS students are meeting or exceeding expectations for the assessed outcomes. These findings indicate we are admitting students who are prepared to handle the challenges of our advanced coursework. They are applying their knowledge to problems posed in their coursework and are doing so successfully. MS students are generally meeting expectations in their MS thesis preparation and defense. While our MS students are performing at our expected levels for these outcomes, we would recommend graduate advisors and graduate course instructors work together to better determine incoming students background so as to improve advising in terms of courses to take and to provide resources to facilitate student learning particularly in new topic areas.

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 and findings were discussed in our annual faculty retreat.

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.

> We will continue to improve our advising and mentoring of graduate students to maintain our high level of student performance, particularly as they progress through our program.

If no changes are being made, please explain why.

>

7. Closing the Loop: Review of <u>Previous</u> Assessment Findings and Changes

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

> We have not made any specific changes to our program as our assessment data consistently shows that our students are meeting and exceeding expectations on our outcomes.

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?

> We will continue to monitor the progress of our students and as areas of concern arise, we will made adjustments to address issues.

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.

SLU Chemistry Department – MS Thesis

	1 (Poor)	2 (Fair)	3 (Good)	4 (Excellent)	Score
Thesis Format	*The organization of the thesis is confusing and/or the length is not appropriate. The references may not be appropriately formatted.*	*The organization of the thesis is, in places, confusing and/or the length is not appropriate. References may not be appropriately formatted. More emphasis should be placed on several of the sections.*	*The thesis is well-organized and is of appropriate length. References are appropriately formatted. More emphasis should be placed on a few of the sections.*	*The thesis is well-organized and is of appropriate length. Chapters are balanced appropriately. References are appropriately formatted.*	
Background Knowledge	*Demonstrates limited knowledge of chemical principles and the current literature.*	*Demonstrates adequate knowledge of chemical principles and an awareness of the current literature, but does not identify unanswered questions in the field.*	*Demonstrates sufficient knowledge of the current literature and chemical principles. Correctly identifies and understands the importance of unanswered questions in the field.*	*Demonstrates the ability to apply fundamental concepts to advanced topics in chemistry and in-depth knowledge of the current literature. Correctly identifies and illustrates the importance of unanswered questions in the field and presents his/her work within the context of these questions.*	
Presentation of Advanced Research	*The aims/objectives and/or the rationale for the project are not adequately described. The experimental approach is neither clearly defined nor logical. Results and discussion are limited.*	*Aims/objectives are described, however, the rationale for the aims/objectives is unclear. The experimental approach is clearly defined and logical, however the results and discussion lack clarity.*	*Aims/objectives are described. A rationale for the aims/objectives is included. The experimental approach is clearly defined and logical. Results are presented and interpreted, but additional discussion should be provided.*	*The aims/objectives are clearly described and provide a logical framework to address a problem. A compelling rationale for the aims/objectives is included. The experimental approach is clearly defined and logical. Results and discussion are complete.*	
Written Communication	*Fails to clearly communicate results and conclusions.*	*Adequately communicates results and conclusions, however supporting information and explanations are missing.*	*Successfully communicates results and conclusions, supporting information and explanations are provided.*	*Results and conclusions are not only successfully summarized and supported, but are also analyzed in the context of the field.*	

Comments: