Annual Assessment Report 2022-2023

MS Biological Sciences

Biological Sciences

College of Science

CONTACT
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DISCIPLINARY ACCREDITATION No

DEVELOPMENT AND DOCUMENTATION OF STUDENT LEARNING OUTCOMES
How were the program's SLOs developed? (select all that apply)
- We developed them as a program/department using our own knowledge and expertise of the field.

Other than the CPP Catalog and the Office of Assessment and Program Review website, where else are your SLOs published? Select all that apply.
- Department/Program Website - provide URL: https://www.cpp.edu/sci/biologicalsciences/about/graduateslos-andassessment.shtml

ASSESSMENT ACTIVITIES IN 2022-2023

This section provides the opportunity for programs to share and discuss assessment activities conducted in **AY 2022-2023.** This includes data collection, rubric development, data analysis, discussion of findings, development or implementation of closing the loop improvement strategies, update of your assessment plan and/or curriculum matrix, etc.

How many total SLOs does your program assess according to your assessment plan?
- 7

How many SLOs did your program assess this past year in 2022-2023?

- My program assessed SLOs in AY 2022-2023 (e.g., artifact collection, scoring, closing the loop, etc.). May also have engaged in assessment planning activities unrelated to specific SLOs (e.g., modified curriculum matrix, assessment plan, etc.).

Please list the SLOs examined

- SLO #1: Students will demonstrate knowledge in areas of biology relevant to selected research interests.
- SLO #2: Students will identify research questions on a contemporary issue in biology, and critically analyze the relevant literature. Students will develop specific hypotheses pertaining to a research problem.
- SLO #3: Students will develop specific hypotheses pertaining to a research problem.
- SLO #4: Students will devise and conduct experiments to test hypotheses.
- SLO #5: Students will demonstrate mastery of the methodology and techniques specific to the field of study.
- SLO #6: Students will statistically analyze and interpret data.
- SLO #7: Students will be able to discuss, both orally and in writing, the relevance of their research data to the original hypotheses and to the general field of interest.

Student Learning Outcome (SLO): Students will demonstrate knowledge in areas of biology relevant to selected research interests.

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Collected indirect evidence of student learning (e.g., surveys, interviews, focus groups, etc.)	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	Criterion Used	Goal Met	Eye-opening Result
158	Average scores	Yes	Faculty and student scores for thesis proposal and thesis defense were above average. Scores for defense increased over those for proposal, especially from student perspective.

Student Learning Outcome (SLO): Students will identify research questions on a contemporary issue in biology, and critically analyze the relevant literature. Students will develop specific hypotheses pertaining to a research problem.

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Collected indirect evidence of student learning (e.g., surveys, interviews, focus groups, etc.)	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
158	Average scores	Yes	Faculty and student scores for thesis proposal and thesis defense were above average. Scores for defense increased over those for proposal, especially from student perspective.

Student Learning Outcome (SLO): **Students will develop specific hypotheses pertaining to a research problem.**

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Collected indirect evidence of student learning (e.g., surveys, interviews, focus groups, etc.)	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
158	Average scores	Yes	Faculty and student scores for thesis proposal and thesis defense were above average. Scores for defense increased over those for proposal, especially from student perspective.

Student Learning Outcome (SLO): Students will devise and conduct experiments to tests hypotheses.

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Collected indirect evidence of student learning (e.g., surveys, interviews, focus groups, etc.)	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	Criterion Used	Goal Met	Eye-opening Result
158	Average scores	Yes	Faculty and student scores for thesis proposal and thesis defense were above average. Scores for defense increased over those for proposal from both student and faculty perspectives, indicating that students' ability devise and conduct experiments to test hypotheses improved between proposal and defense.

Student Learning Outcome (SLO): Students will demonstrate mastery of the methodology and techniques specific to the field of study.

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Collected indirect evidence of student learning (e.g., surveys, interviews, focus groups, etc.)	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	Criterion Used	Goal Met	Eye-opening Result
158	Average scores	Yes	Student scores for thesis proposal were below average, whereas faculty scores for thesis proposal were average. Scores for thesis defense were above average and increased considerably and similarly over those for proposal from both the faculty and student perspectives.

Student Learning Outcome (SLO): Students will statistically analyze and interpret data.

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Scored indirect evidence of student learning	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
158	Average scores	Yes	Both faculty and student scores for thesis proposal were below average. Scores improved considerably moving to above average from thesis proposal to thesis defense from both faculty and student perspectives, reflecting improvement in quantitative skills that is expected to come with data analysis and interpretation.

Student Learning Outcome (SLO): Students will be able to discuss, both orally and in writing, the relevance of their research data to the original hypotheses and to the general field of interest.

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected direct evidence (e.g., student work, exam items, etc.) • Scored direct evidence of student learning	• Oral performance (e.g., presentation, defense, conference presentation, etc.) • Thesis or dissertation (graduate-level only)	• Used professional judgement (no rubric or scoring guide used)
• Collected indirect evidence of student learning (e.g., surveys, interviews, focus groups, etc.)	• Student survey/interview/focus group with self-reports of SLO achievement • Other: Faculty survey of SLO achievement	

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
158	Average scores	Yes	Faculty and student scores were well below average at the proposal stage, and were the lowest scores of all of the SLOs. Both faculty and student scores increased dramatically at the defense, indicating that students' skills in scientific communication improved considerably, thus providing evidence of program effectiveness in fulfilling this SLO.

IMPROVING THROUGH ASSESSMENT

Overall, what best describes how the program used the results in 2022-2023? Select all that apply.
- Students' out-of-course changes (e.g., advising, co-curricular experiences, mentoring, program website, workshops, brown bag lunches, etc.)
- Other, please explain: New course proposal under review (BIO 5111 – Communicating Biology)

Ideas to improve student learning can come from different constituents. With whom did the program discuss assessment planning and/or share results during AY 2021-2022? Select all that apply.
- Program/department faculty as whole
- A committee of program/department faculty

The past academic year posed both challenges and opportunities. Please share any assessment discoveries (e.g., insights about assessment procedures, great achievements, etc.) regarding program assessment in 2022-2023 so that others may learn from your experiences.
The results show that students show mastery of SLOs by completion of the program, though there clearly is room for improvement. We plan to continue exploring ways to standardize for quality of theses, as well as mastery of accompanying skills, especially quantitative/statistical analysis and scientific communication. We recently implemented new advising tools (i.e,. timeline, expectations for completion of milestones, modification of annual progress report), as we seek to strengthen the program. Ongoing updates to the website are facilitating clarity for students and their thesis advisors of expectations and responsibilities. The graduate student club has had continued success, offering support, social engagement, and professional growth opportunities for students, as well as a travel fund for attending conferences to give research presentations.

Please share how the program triangulates various data sources to determine student success. Consider assessment findings, CPP's GI2025 markers, CSU Dashboard, CPP's Student Success Dashboard on Tableau, course evaluations, etc.
We use data from student and faculty surveys on proposals and defenses as one component to guide departmental graduate committee work on improving the program and modifying it as needed with changing academic and social environments. Each year we examine demographic data on our applicants as well as students retained in the program to ensure we are not losing students from a specific background or group. We will continue to advertise DEI funding opportunities for students via email announcements.

Does the program offer a certificate or credential (e.g., teaching credential)?
- No

The most current assessment plan and curriculum matrix we have on file for your program may be found <u>here</u>. To ensure we have the most updated assessment plan and curriculum matrix for your program, and for posting on our website, please upload the following documents:

Assessment Plan - Yes

Curriculum Matrix - Yes