CAL POLY POMONA
ASSESSMENT & PROGRAM REVIEW

Annual Assessment Report 2023-2024

MS Biological Sciences

Department of Biological Sciences

College of Science

CONTACT

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Name of Person Completing Report A. Kristopher Lappin

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 Website - provide URL: https://www.cpp.edu/sci/biological-sciences/graduate-studies/index.shtml

ASSESSMENT ACTIVITIES IN 2023-2024

This section provides the opportunity for programs to share and discuss assessment activities conducted in **AY 2023-2024.** 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 2023-2024?

- My program assessed SLOs in AY 2023-2024 (e.g., artifact collection, scoring, closing the loop, 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/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
154	Average scores	Yes	Faculty and student scores for thesis proposal and thesis defense were above average. Scores for defense increased slightly over those for proposal 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/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Student reflective writing assignment (essay, journal entry, self-assessment) on their SLO achievement • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

Findings			
N of Artifacts	Criterion Used	Goal Met	Eye-opening Result
153	Average scores	Yes	Faculty and student scores for thesis proposal and thesis defense were above average. Scores for defense increased slightly over those for proposal 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/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

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

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

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
152	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/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
158	Average scores	Yes	Student scores for thesis proposal were close to average, and faculty scores for thesis proposal were average. Scores for thesis defense increased to above average from both student and faculty perspectives, most notably from the student perspective.

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

Assessment Activities	Evidence Used	Evaluation and Interpretation of Evidence
• Collected/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
145	Average scores	Yes	Both faculty and student scores for thesis proposal were average. For the thesis defense scores remained average from faculty perspective and increased to above average from student perspective.

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/Analyzed/Developed/Modified/Discussed assessment tools	• Oral performance (e.g., presentation, defense, conference presentation, etc.) (Direct) • Thesis or dissertation (graduate-level only) (Direct) • Student survey/interview/focus group with self-reports of SLO achievement (Indirect) • Other, please explain: Faculty survey of SLO achievement	• Used professional judgement (no rubric or scoring guide used)

Findings			
N of Artifacts	**Criterion Used**	**Goal Met**	**Eye-opening Result**
158	Average scores	Yes	Scores were average at the proposal stage from both faculty and student perspectives. Scores increased at the defense from the student perspective and were similar from the faculty perspective. To address a departmental desire to improve students' skills in scientific communication, a new course (BIO 5111 - Communicating Biology) is now a required and taken by our graduate students their first fall semester in the program.

IMPROVING THROUGH ASSESSMENT

Overall, what best describes how the program used the results in 2023-2024? Select all that apply.

- Assessment procedure changes (SLOs, curriculum matrix, rubrics, evidence collected, sampling, communications with faculty, etc.)
- Course-level changes (e.g., syllabus, content, pedagogy)
- Program curricular changes (e.g., course sequencing, changes to required curriculum, added or deleted courses)
- Personnel changes (e.g., faculty, laboratory staff, academic advisors etc.)
- Students' out-of-course changes (e.g., advising, co-curricular experiences, mentoring, program website, workshops, brown bag lunches, etc.)
- Resource allocation changes (e.g., funding for professional development, workshops, etc.)
- Results indicated no action needed because students met expectations
- Use is pending (typical reasons: insufficient number of students in population, evidence not evaluated or interpreted yet, faculty discussions are ongoing, etc.)
- Other, please explain:
- Other, please explain:

Ideas to improve student learning can come from different constituents. With whom did the program discuss assessment planning and/or share results during AY 2023-2024? 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 2023-2024 so that others may learn from your experiences.

The results show that our graduate students generally show mastery of SLOs by completion of the program, though there is room for improvement. We continue to explore ways to standardize for quality of theses, as well as mastery of accompanying skills. Two key areas for improvement are quantitative/statistical analysis and, most significantly, oral and written communication. Most significantly, to address the departmental desire to improve students' skills in scientific communication, a new course (BIO 5111 - Communicating Biology) is now a required core course taken by our graduate students their first fall semester in the program. In addition, new advising tools implemented the past couple of years (i.e., thesis timeline, expectations for completion of milestones, further modification of annual progress report) are being used to keep students on track for timely graduation. 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.

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, CPP's Graduating Senior Survey 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 to improve the program and make modifications as needed with changing academic and social environments. Each year we examine demographic data on our students (Tableau) to examine retention in the program to ensure we are not losing students from a specific background or group. We will continue to advertise funding opportunities for students, including those specific to DEI 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 here. 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