Assurance of Student Learning Reflection 2024-2025	
Ogden College of Science and Engineering	School of Engineering and Applied Sciences
Computer Science 117	
Interim Co-Directors: Mark Cambron, Guangming Xing, Program Coordinator: Guangming Xing	
Is this an online program? ☐ Yes ☒ No	Please make sure the Program Learning Outcomes listed match those in CourseLeaf. Indicate verification here ☒ Yes, they match! (If they don't match, explain on this page under **Evaluation)**

Instructions: For the 2024-25 assessment, we are asking you to reflect on the last three-year cycle rather than collect data. It's important to take time to look over the results from the last assessment cycle and really focus on a data-informed direction going forward. In collaboration with your assessment team and program faculty, review each submitted template from 2021-2024 and consider the following for each Program Learning Outcome, add your narrative to the template, and submit the draft to your ASL Rep by May 15, 2025.

Program Student Learning Outcome 1	
Program Student Learning Outcome	**Graduates will be able to communicate in oral and written form at a level commensurate with that of students completing a Master's degree.**
Evaluation	Using the last three assessment cycles, is this program learning outcome still relevant, or should it be changed? If it has recently changed, please explain. Other things to examine: Is the outcome measurable? Is it double or triple barreled? Does it include measurable verbs following Bloom's Taxonomy? Do you have the appropriate numbers of SLOs to measure regularly? Please consider choosing the most important. This outcome remains central to graduate education and relevant for assessing student readiness for professional and academic careers. It is measurable and clearly stated. Both elements are essential and complementary in our context. The outcome served us well in evaluating graduate-level communication standards.
Measurement Instruments	Are the measurement instruments actually measuring the outcome? If you change the SLO, is this still the best instrument to use? Is this a direct or indirect measure? Is your artifact appropriate? If not, what other options are there? Will the rise in the use of AI affect the assignment and measurement? If there are rubrics, do they need to be altered to better fit the learning outcome? Does the rubric (if using) work or does it need to be adjusted? We used final project documentation and oral presentations from CS 560 and CS 543 as primary artifacts. These provided direct evidence of student communication ability. Faculty used a locally developed rubric to assess writing quality, organization, clarity, and technical presentation. However, rubric consistency across courses varied, and the rise of AI tools (e.g., ChatGPT, Grammarly) has begun to influence student writing. There is a growing need to assess the process of writing, not just the final product.
Criteria & Targets	Does Criteria for Success (level of performance students will have achieved for your program to have been successful--ex., students will

	have earned 4/5 for documentation and citation on capstone essays) need to be changed? What about targets? If you have successfully made your targets consistently, consider a more challenging target. This was met in the majority of cases. While the target was appropriate, we will look into the rise of AI tools and their effects, especially on writing.
Results & Conclusion	**Results**: Are the results what was expected or not? What stood out in the assessment cycle over the past three years? Explain **Conclusions**: What worked? What didn't? Why do you think this? For example, maybe the content in one or more courses was modified; changed course sequence (detail modifications); changed admission criteria (detail modifications); changed instructional methodology (detail modifications); changed student advisement process (detail modifications); program suspended; changed textbooks; facility changed (e.g. classroom modifications); introduced new technology (e.g. smart classrooms, computer facilities, etc.); faculty hired to fill a particular content need; faculty instructional training; development of a more refined assessment tool. Results: Overall performance met expectations. Conclusions: What worked: written assignments that included instructor feedback and templates. What didn't: variability in how presentations were prepared and evaluated. Rubric interpretation varied. As a result, students did not always receive consistent guidance or feedback. Transition Note: This reflection helped us recognize that a more generalized and flexible communication outcome would be more appropriate moving forward—hence our transition to the new SLO 3 ("Communicate effectively in a variety of professional contexts"), which emphasizes adaptability in communication style and context, not just formality or modality.
****IMPORTANT - Plans for Next Assessment Cycle**:	As we work hard to improve our assessment practices and make them more meaningful and effective, it's important each program craft a three-year plan for the following assessment cycle (2025-26, 2026-27, 2027-28) – this process assists in "closing the loop." For example, you may decide to: • collect a more appropriate artifact • create new program outcomes • adjust targets because they are consistently exceeded or not met • need to reconstruct your curriculum map • sequencing of classes might need to be adjusted, or additional class(es) provided Whatever your plan is, provide a narrative, in future tense, that indicates how you will approach future assessments. You will be expected to implement any needed changes before the next assessment cycle. Going forward, we will implement a unified communication rubric across multiple core courses. We plan to collect writing process artifacts (drafts, outlines) to better evaluate authentic student work. In the 2026–27 cycle, we'll incorporate more varied oral communication contexts (e.g., lightning talks, project pitches). Our new SLO 3 will allow us to assess communication beyond academic formats, such as team meetings or technical demos.

Program Student Learning Outcome 2	
Program Student Learning Outcome	Graduates will be able to design and implement solutions that develop critical thinking skills that make them better able to address concerns in society.
Evaluation	Using the last three assessment cycles, is this program learning outcome still relevant, or should it be changed? Other things to examine: Is the outcome measurable? Is it double or triple barreled? Does it include measurable verbs following Bloom's Taxonomy? This outcome was foundational for evaluating the technical and intellectual maturity of our students. However, over time, we found the phrasing to be overly broad and somewhat problematic—it combines multiple constructs (design, implementation, critical thinking, and societal concerns), making it difficult to measure systematically or with targeted assignments.
Measurement Instruments	Are the measurement instruments actually measuring the outcome? If you change the SLO, is this still the best instrument to use? Is this a direct or indirect measure? Is your artifact appropriate? If not, what other options are there? Will the rise in the use of AI affect the assignment and measurement? If there are rubrics, do they need to be altered to better fit the learning outcome? Does the rubric (if using) work or does it need to be adjusted? We primarily relied on project work in CS 560 and CS 543, where students implemented software systems or analyzed technical problems. These are direct measures of design and implementation, but not always of critical thinking.
Criteria & Targets	Does Criteria for Success (level of performance students will have achieved for your program to have been successful (ex., students will have earned 4/5 for documentation and citation on capstone essays) need to be changed? What about targets? Our target was that at least 80% of students would demonstrate competency (≥4/5) in design and implementation skills. This was typically met. However, few projects explicitly addressed societal concerns unless instructors provided specific prompts. As such, we lacked a consistent basis to evaluate that aspect.
Results & Conclusion	**Results**: Are the results what was expected or not? What stood out in the assessment cycle over the past three years? Explain

	Conclusions: What worked? What didn't? Why do you think this? For example, maybe the content in one or more courses was modified; changed course sequence (detail modifications); changed admission criteria (detail modifications); changed instructional methodology (detail modifications); changed student advisement process (detail modifications); program suspended; changed textbooks; facility changed (e.g. classroom modifications); introduced new technology (e.g. smart classrooms, computer facilities, etc.); faculty hired to fill a particular content need; faculty instructional training; development of a more refined assessment tool. Students generally excelled in implementing solutions and applying technical knowledge. However, opportunities to reflect on societal context or ethical implications were limited. Conclusions: Project design scaffolding, such as milestones and prototypes, helped students succeed in the technical portion. Where implemented, guided reflections enhanced critical thinking, but these were optional. Our curriculum lacked a formal structure for engaging with social impact or ethical dimensions. Transition Note: These challenges led us to adopt two more focused and measurable SLOs: New SLO 1: Design, implement, and evaluate a computing-based solution..., and New SLO 2: Apply computer science theory and software development fundamentals... These revisions allow us to target design/implementation and theory/application as distinct, measurable
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Program Student Learning Outcome 3

Program Student Learning Outcome	Graduates will be well prepared for further studies or for employment in schools, government, or industry and be aware of opportunities for further graduate studies or employment both nationally and internationally.
Evaluation	Using the last three assessment cycles, is this program learning outcome still relevant, or should it be changed? Other things to examine: Is the outcome measurable? Is it double or triple barreled? Does it include measurable verbs following Bloom's Taxonomy? While this outcome reflects long-term goals of the program, it is not measurable through direct assessment. It blends preparation, employment, further study, and awareness—making it difficult to evaluate using course-based artifacts or standard tools. It also lacks specific verbs or outcomes aligned with Bloom's taxonomy.
Measurement Instruments	Are the measurement instruments actually measuring the outcome? If you change the SLO, is this still the best instrument to use? Is this a direct or indirect measure? Is your artifact appropriate? If not, what other options are there? Will the rise in the use of AI affect the assignment and measurement? If there are rubrics, do they need to be altered to better fit the learning outcome? Does the rubric (if using) work or does it need to be adjusted? Exit interviews and informal surveys were used. These are indirect measures and often anecdotal. Some data from Career Services was helpful but not directly linked to specific program outcomes. Overall, this SLO did not lend itself to consistent, systematic measurement.
Criteria & Targets	Does Criteria for Success (level of performance students will have achieved for your program to have been successful (ex., students will have earned 4/5 for documentation and citation on capstone essays) need to be changed? What about targets? The implicit goal was that students would feel prepared and be successful in their post-graduate endeavors. While many students did secure jobs or graduate placements, we lacked consistent documentation. Targets were not clearly defined or tracked with artifacts.
Results & Conclusion	**Results**: Are the results what was expected or not? What stood out in the assessment cycle over the past three years? Explain **Conclusions**: What worked? What didn't? Why do you think this? For example, maybe the content in one or more courses was modified; changed course sequence (detail modifications); changed admission criteria (detail modifications); changed instructional methodology (detail modifications); changed student advisement process (detail modifications); program suspended; changed textbooks; facility changed (e.g. classroom modifications); introduced new technology (e.g. smart classrooms, computer facilities, etc.); faculty hired to fill a particular content need; faculty instructional training; development of a more refined assessment tool. Student feedbacks suggest satisfaction with preparation and employment success, though feedback on career planning support was mixed. Some students benefited from optional résumé workshops and advising, but these supports were not embedded in the curriculum. Career readiness was unevenly addressed, and "awareness" of opportunities was difficult to assess. Transition Note: Because of the limitations of this SLO, we have replaced it with outcomes that are more directly tied to educational experiences and measurable learning: New SLO 1 and 2 emphasize readiness through skills, not just perceptions. New SLO 3 (communicate effectively in professional contexts) supports preparation by emphasizing a transferable skill highly valued in both graduate and career pathways.

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To add more outcomes, if needed, select the table above and copy & paste below.

Proposed SLOs

1. **Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.**
2. **Apply computer science theory and software development fundamentals to produce computing-based solutions.**
3. **Communicate effectively in a variety of professional contexts.**