

Assurance of Student Learning Reflection 2024-2025

<i>Ogden College of Science and Engineering</i>	<i>School of Engineering and Applied Science</i>
<i>1700 – Land Surveying</i>	
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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	Identify, formulate, and solve complex surveying problems by applying principles of engineering, science, and mathematics.
Evaluation	This outcome remains highly relevant and aligned with both program goals and ABET expectations for surveying and engineering disciplines. It is measurable, uses action verbs consistent with Bloom's Taxonomy, and reflects core competencies expected of surveying professionals. The outcome will not be changed, as it appropriately captures the analytical and problem-solving skills central to student success in the land surveying program.
Measurement Instruments	This outcome is assessed through direct measures in CE 380 (Boundary Surveying). In this courses, students complete complex field and classroom-based assignments requiring application of mathematical computations, engineering principles, and surveying methods to real-world scenarios. Artifacts include: - Exams/reports detailing problem formulation and methodology - CAD-based plats and alignment designs These assignments are evaluated using structured rubrics that assess technical accuracy, application of relevant principles, and problem-solving processes. Instruments are appropriate and directly measure the intended outcome.
Criteria & Targets	The program's criterion for success is that the cohort average for assignments linked to this outcome will be 3.0 or higher on a 4.0 scale. This target reflects a standard of proficiency expected of students nearing graduation. It balances rigor with realism and ensures students demonstrate competence in solving the types of surveying challenges they will encounter in professional practice. This threshold has been appropriate for monitoring performance over time and will remain unchanged for the next cycle.
Results & Conclusion	<u>Results:</u> Assessment data from the past three academic years show that student performance consistently meets the established target indicating a strong grasp of the technical material. These results affirm that students are successfully learning to identify and solve complex surveying problems. <u>Conclusions:</u> The data suggest that the current instructional sequence and assessment strategy are effective in preparing students for advanced problem-solving in land surveying. While students generally perform well in technical tasks, some challenges have been observed in interpreting legal boundary descriptions and deed records. In response, additional emphasis has been placed on these areas in CE 380, including enhanced instruction and more applied examples. The continued use of CE 380 as assessment points is appropriate, and the program intends

	to retain this structure while refining rubrics to reflect evolving industry standards better. The outcome remains robust and will continue to be a foundational focus for the program.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	To ensure continued alignment with industry expectations and support ongoing student success, the following actions will be implemented during the next assessment cycle: • Continue assessing this outcome in CE 380 using assignments/exams. • Maintain the cohort benchmark of a 3.0 average or higher on a 4.0 scale. • Review results annually to identify areas for improvement and to ensure the outcome continues to support student readiness for professional licensure and practice.

Program Student Learning Outcome 2	
Program Student Learning Outcome	Apply engineering design to produce solutions that meet the specific needs of the surveying industry with consideration of public health, safety, and welfare.
Evaluation	This outcome remains a critical component of the Land Surveying program and aligns with ABET criteria for engineering programs. It emphasizes the application of engineering design within the surveying profession, while incorporating awareness of ethical responsibility and public impact. The language of the outcome is measurable, focused, and appropriate, utilizing verbs that reflect higher-order thinking skills within Bloom's Taxonomy. As such, no changes are being made to the outcome.
Measurement Instruments	This outcome is assessed using direct measures from major project assignments in CE 378. Students are tasked with designing horizontal and vertical alignments for a proposed route, balancing site conditions, grading constraints, legal limitations, and safety considerations. Artifacts include design documentation, alignment plans, calculations, and written design justifications. These deliverables are evaluated using a structured rubric that measures design feasibility, compliance with accepted standards, accuracy of engineering computations, and the extent to which public health, safety, and welfare are addressed. This instrument effectively measures the desired outcome and captures the student's ability to integrate design thinking with societal awareness.
Criteria & Targets	The program target is that the cohort average for design-related assignments in CE 378 will be 3.0 or higher on a 4.0 scale. This benchmark represents proficiency in applying surveying-specific design methods within an engineering framework, while also demonstrating awareness of safety and ethical responsibilities. This criterion has proven to be appropriate and consistent with expectations for students approaching program completion.
Results & Conclusion	<u>Results:</u> Assessment results over the past three academic years show that the majority of students are meeting the expected performance level. Students generally demonstrate strong technical design skills, especially in geometric layout and grade calculations. However, some inconsistencies have been noted in the depth of discussion surrounding public health, safety, and welfare within their design justifications, suggesting that more emphasis may be needed in connecting technical decisions to societal outcomes. <u>Conclusions:</u> The instructional strategies used in CE 378 are successfully supporting the development of engineering design competencies in the context of surveying. Students demonstrate clear proficiency in applying technical design principles to realistic projects. However, there is an opportunity to improve how students articulate the broader impact of their work.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	To ensure continued improvement in student learning and alignment with ABET expectations, the following actions will be implemented: • Continue assessing this outcome exclusively in CE 378 through design-based assignments. • Maintain the cohort performance benchmark of a 3.0 or higher average on a 4.0 scale.

Program Student Learning Outcome 3

Program Student Learning Outcome	Apply new knowledge as needed, using appropriate learning strategies
Evaluation	This outcome is essential for preparing students to adapt in a rapidly evolving technical field such as land surveying, where new software, methods, and regulations are introduced regularly. It reflects a student's capacity for self-directed learning, professional development, and lifelong learning, qualities emphasized by both ABET and industry stakeholders. The outcome language is measurable and well-aligned with Bloom's Taxonomy, emphasizing the ability to "apply" and "use" appropriate strategies to learn independently. No changes are proposed, as the outcome continues to reflect a vital component of the professional skill set required of graduates. This learning outcome is integrated throughout the curriculum but is formally assessed in CE 378 and CE 380, where students are expected to use new or unfamiliar tools, solve novel design problems, and seek out additional resources as part of their coursework.
Measurement Instruments	The primary method of assessment for this outcome is a reflective component embedded within the CE 378 and CE 380 courses. Students complete coursework that intentionally includes unfamiliar tools, revised constraints, or open-ended scenarios requiring them to seek additional knowledge independently. The coursework is evaluated using a rubric that evaluates initiative, resourcefulness, effectiveness of chosen learning strategies, and the successful application of new knowledge. This approach ensures direct measurement of the outcome while supporting metacognitive growth.
Criteria & Targets	The program's benchmark for this outcome is that the cohort average for the reflective and application components will be 3.0 or higher on a 4.0 scale. This standard reflects the expectation that students demonstrate independent learning capacity and effectively apply that knowledge in a technical context. This benchmark has proven appropriate for measuring professional adaptability and preparedness for post-graduation learning.
Results & Conclusion	<u>Results:</u> Assessment results from the last three-year cycle indicate that most students met or exceeded the performance target. <u>Conclusions:</u> The data suggest that the curriculum is supporting students' development as self-directed learners capable of acquiring and applying new knowledge. That said, some students struggled to apply new knowledge and/or using appropriate learning strategies. The current instructional approach will be maintained with minor refinements.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	To support continuous improvement and ensure that students are well-prepared for lifelong learning, the following steps will be taken: • Continue assessing this outcome through the reflective and design-based assignments in CE 378 and CE 380. • Maintain the cohort target of a 3.0 or higher average on a 4.0 scale. • Include in-class discussions about learning from failure and adapting to change to reinforce the importance of resilience and independent problem-solving in professional practice.