

Assurance of Student Learning Reflection 2024-2025

Ogden	School of Engineering and Applied Sciences (SEAS)
Mechanical Engineering, 543	
Program Coordinator: Morteza Nurcheshmeh	
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	Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (ABET SLO #1)
Evaluation	This program learning outcome is relevant and does not need to be changed, as it aligns well with the student learning outcomes mandated by ABET. It has remained consistent in recent years. The outcome is measurable through the assessment of student work from selected coursework. It includes measurable action verbs, and a numerical score is assigned using a rubric to evaluate student performance. This student learning outcome (SLO) is assessed annually by the Mechanical Engineering program faculty.
Measurement Instruments	The current measurement instruments are effectively capturing and evaluating the intended learning outcome. Since this student learning outcome (SLO) is also used for ABET assessment purposes, there are no current plans to revise it. The selected assessment artifact is appropriate and continues to serve its purpose well. In fact, the artifact was reviewed and enhanced within the past year by incorporating additional components to improve assessment quality, based on feedback received during the last ABET review. The Mechanical Engineering faculty do not anticipate that the increasing use of artificial intelligence tools will significantly impact the assessment or measurement of this outcome, as it primarily focuses on students' problem-solving abilities, skills that require critical thinking and application of engineering knowledge. The rubrics currently used to assess this outcome remain valid and effective. They include clearly defined performance criteria and have proven to be reliable in measuring the extent to which students are achieving the desired outcome. At this time, no changes to the rubrics are deemed necessary.
Criteria & Targets	At this time, we do not believe any changes are necessary regarding the level of performance achieved by students. The current performance target, an average score of 3 out of 4 for the student cohort, continues to be appropriate and sufficient. This benchmark has consistently been met in recent assessment cycles and has not been a point of concern during past ABET accreditation visits. In fact, during the most recent ABET review, no issues were raised related to either the performance level of students or the appropriateness of the target threshold. Therefore, we are confident that the current standard remains an effective indicator of student achievement for this learning outcome.
Results & Conclusion	<u>Results:</u>

	Student performance under Outcome 1 has been consistently acceptable over the past three years, based on rubric-based direct evaluations of student work. Graduates are expected to complete relevant coursework with satisfactory grades, ensuring that they possess the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. The WKU Mechanical Engineering Program remains committed to preparing graduates with a curriculum that supports this outcome and will continue to monitor student achievement using these established assessment methods. The integration of grade reports generated almost automatically by Institutional Research (IR), along with Qualtrics surveys of students, has streamlined the assessment process and made it more efficient. To further strengthen the evaluation of Outcome 1, the ME program has incorporated final reports from the Senior Seminar course (ENGR 490) into the assessment. These reports provide additional insight into students' abilities to solve open-ended engineering problems. The inclusion of ENGR 490 represents a meaningful enhancement to the assessment of Student Learning Outcome 1, and the program plans to continue using this approach in future assessment cycles. <u>Conclusions:</u> No programmatic adjustments have been deemed necessary at this time. The Mechanical Engineering faculty will continue conducting program assessments on an annual basis to ensure ongoing evaluation of student performance. As required by the accrediting agency, ABET, the program remains committed to a process of continuous improvement through systematic assessment of student learning outcomes. This ongoing effort ensures that the program maintains high standards and continues to meet the expectations of both the institution and the profession. What our program is doing for this assessment is considered acceptable in the last ABET visit.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	This SLO will be assessed each academic year, with data from both terms, as part of the regular ABET program assessment activities. The assessment plan is revised constantly if needed when we do the assessment annually and the program currently has clear plan how this SLO will be assed in coming years.

Program Student Learning Outcome 2	
Program Student Learning Outcome	Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. (ABET SLO #4)
Evaluation	This program learning outcome remains relevant and does not require any modifications, as it aligns closely with the student learning outcomes mandated by ABET. It has remained consistent over recent years, reflecting its continued applicability and clarity. The outcome is clearly measurable through the evaluation of student work from selected coursework, using established assessment methods. It incorporates measurable action verbs and is evaluated using a rubric that assigns numerical scores to reflect levels of student achievement. This student learning outcome (SLO) is assessed annually by the Mechanical Engineering program faculty to ensure alignment with program objectives and accreditation standards.
Measurement Instruments	The current measurement instruments are effectively capturing and evaluating the intended student learning outcome. Since this outcome is also utilized for ABET assessment purposes, there are no plans at this time to revise it. The selected assessment artifact remains appropriate and continues to provide meaningful evidence of student achievement. The Mechanical Engineering faculty do not anticipate that the growing presence of artificial intelligence tools will significantly affect the assessment or measurement of this outcome. The rubrics currently employed to evaluate this outcome remain both valid and effective. They contain clearly defined performance criteria and have consistently demonstrated reliability in assessing the extent to which students meet the outcome. At this point, no changes to the rubrics are considered necessary.
Criteria & Targets	At present, no changes are considered necessary to the expected level of student performance. The current benchmark, an average score of 3 out of 4 across the student cohort, remains both appropriate and adequate for assessing this learning outcome. This target has been consistently met in recent assessment cycles and has not drawn any concerns during previous ABET accreditation visits. As such, we remain confident that the existing standard serves as a reliable and effective measure of student achievement for this outcome.

Results & Conclusion	Results: Student performance under Outcome 2 has been consistently acceptable over the past three years, based on the results from the three assessment measures employed. The WKU Mechanical Engineering Program has demonstrated that its graduates possess the ability to recognize ethical and professional responsibilities in engineering contexts and to make informed judgments that consider the broader impact of engineering solutions in global, economic, environmental, and societal settings. The program will continue to deliver the same curriculum content that supports this learning outcome and will maintain its current assessment approach to monitor student progress. Annual reviews consistently show that the program is meeting the target for Learning Outcome 2, affirming the effectiveness of both the curriculum and the assessment methods used. Conclusions: No need for programmatic adjustments has been found. The mechanical engineering faculty will continue with program assessment on an annual basis. The accrediting agency, ABET, requires continual improvement through systematic assessment of student learning outcomes.
**IMPORTANT - Plans for Next Assessment Cycle:	This SLO will be assessed each academic year, with data from both terms, as part of the regular ABET program assessment activities.

Program Student Learning Outcome 3	
Program Student Learning Outcome	Graduates have an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. (ABET SLO #5)
Evaluation	This program learning outcome remains relevant and does not require any revisions, as it aligns well with the student learning outcomes mandated by ABET. Its consistency in recent years reflects both its clarity and continued applicability within the curriculum. The outcome is readily measurable through the evaluation of student work from selected coursework, utilizing well-established assessment methods. It includes clearly defined, measurable action verbs and is assessed using a rubric that assigns numerical scores to represent various levels of student achievement. This student learning outcome (SLO) is evaluated annually by the Mechanical Engineering program faculty to ensure it remains aligned with both program objectives and accreditation requirements. This ongoing assessment supports continuous improvement and helps maintain the rigor and relevance of the program.
Measurement Instruments	The current measurement instruments are effectively capturing and evaluating the intended student learning outcome. Because this outcome is also used for ABET assessment purposes, there are no plans to revise it at this time. The selected assessment artifact remains appropriate and continues to provide meaningful and reliable evidence of student achievement. The Mechanical Engineering faculty do not anticipate that the increasing integration of artificial intelligence tools in academic settings will impact the assessment or measurement of this outcome. The rubrics used to evaluate this outcome remain both valid and effective. They include clearly defined performance criteria and have consistently proven reliable in measuring the extent to which students are meeting the desired expectations. At present, no revisions to the rubrics are deemed necessary.
Criteria & Targets	At present, no changes are deemed necessary to the expected level of student performance for this learning outcome. The current benchmark, an average score of 3 out of 4 across the student cohort, continues to be both appropriate and sufficient for evaluating student achievement. This target has been consistently met over multiple assessment cycles, reflecting steady and satisfactory student performance. Moreover, this performance threshold has not raised any concerns during previous ABET accreditation visits, further reinforcing its validity. Based on this consistent track record and external validation, the Mechanical Engineering faculty remain confident that the existing standard provides a reliable and effective measure of student attainment for this outcome. The program will continue to monitor performance data closely to ensure that this benchmark remains aligned with evolving academic and industry expectations.

Results & Conclusion	<u>Results:</u> Student performance under Outcome 3 has been found to be acceptable based on rubric-based direct evaluations of student work. Graduates are completing the relevant coursework with satisfactory grades, demonstrating that they possess the ability to develop and conduct appropriate experiments, analyze and interpret data, and apply engineering judgment to draw meaningful conclusions. The WKU Mechanical Engineering Program will continue to prepare students using the current curriculum content, which effectively supports this outcome. The program will also maintain its established assessment practices to monitor and evaluate this student learning outcome on an ongoing basis. <u>Conclusions:</u> At this time, no programmatic adjustments have been found necessary, as the current curriculum and assessment practices continue to support student success effectively. The Mechanical Engineering faculty remain committed to maintaining academic quality and will continue conducting comprehensive program assessments on an annual basis to ensure alignment with educational objectives and accreditation standards. The accrediting agency, ABET, emphasizes the importance of continuous improvement through the systematic assessment of student learning outcomes. In keeping with this expectation, the WKU Mechanical Engineering Program will persist in using data-driven evaluation methods to monitor student performance and make informed decisions to enhance program quality when needed.
<u>**IMPORTANT - Plans for Next Assessment Cycle:</u>	This SLO is assessed annually.