Assurance of Student Learning Reflection 2024-2025	
Ogden College of Science Engineering	*SEAS*
Lean Sigma Certificate (0496)	
Dr. Greg Arbuckle	
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 demonstrate advanced knowledge and competency in Lean Six Sigma to be able to identify, formulate, and solve technical problems.**
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 highly relevant and aligned with both industry expectations and academic standards in Lean Six Sigma. The outcome is clearly stated and measurable, and it continues to reflect the core objective of the certificate program. No revision is needed at this time.
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? The instruments require students to: 1) Write Python programs 2) Clean and manipulate large datasets 3) Apply data analytics and modeling 4) Evaluate and present results. These tasks directly align with the outcome's focus on both programming and data analysis. If the SLO is split (e.g., into "Write programs" and "Analyze datasets"), the current assignments may still work but may need re-alignment. It is a directly measure. Students submit Python programs that are evaluated using detailed rubrics. Their work is assessed based on demonstrated skills. The artifact is appropriate. The assignments are authentic, real-world tasks (e.g., cleaning and analyzing movie ratings or air pollution data) and reflect both industry practices and course learning goals. The rise in the use of AI likely affect the assignment and measurement. AI tools (e.g., ChatGPT, GitHub Copilot) could generate code for students, reducing the reliability of code-only assessments. Rubrics O1, O1-1, and O1-2 are appropriate but could be updated to reflect use of AI-assistance guidelines

	• **Instrument 1**: Final project/research paper in EGMT 594 (Lean Systems) • **Instrument 2**: Application papers in EGMT 580 (Six Sigma Quality) • **Instrument 3**: Application papers in EGMT 540 (Theory of Constraints) – added in this cycle for the first time All three are direct measures that align well with the outcome. Each assesses a distinct component of Lean Six Sigma principles applied to real-world or research-based problems. No major revisions are needed, but continued monitoring of rubric calibration and possible AI-supported writing use will be important in future assessments.

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.
	Criteria for Success are not necessarily need to be changed.
	
	• **Success Criterion**: 75% of students must score at or above the "Competency" level on the assessment rubric for each course.
	• **Rubric Scales**:
	  o EGMT 594: 4-point scale (Mastery, Competency, Marginal, Deficient)
	  o EGMT 580 & 540: 5-point scale (Outstanding, Commendable, Competency, Marginal, Deficient)
	• The target was met for all instruments.
	
	These criteria are appropriately and will be retained in the next cycle.

Results & Conclusion	**Results**: Are the results what was expected or not? What stood out in the assessment cycle over the past three years? Explain Yes. All years met the target. The most recent year saw 100% success. Stable achievement across years, despite slight cohort size variation. Consistent use of real datasets with practical relevance. The evaluation results show that teaching methods and content delivery have been effective. **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. The wored items include: 1) Python-based assessments using real datasets 2) Rubric-guided evaluations (O1, O1-1, O1-2) 3) Alignment with program and industry needs. 4) Focused course (CS 555) as a dedicated platform for SLO 1. Rubrics or assignments not evolving in light of AI trends.

	The results indicate that certificate students are successfully applying Lean Six Sigma principles across multiple dimensions: system analysis, data-driven problem solving, and continuous improvement methodologies. No major deficiencies were identified in student performance or in the alignment between assignments and outcomes. The assessment process also benefited from consistent use of clear rubrics and exclusion of non-certificate students from the data set.
****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. **Courses Assessed**: • EGMT 594 (Lean Systems) • EGMT 580 (Six Sigma Quality) • EGMT 540 (Theory of Constraints) **Artifacts Collected**: Final project reports and application papers. **Responsible Faculty**: Instructors of record will collect, evaluate, and submit assessment data for students enrolled in the certificate. **Action Plan**: Maintain current instruments and rubrics.

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