

# AY 2026 Continuous Curriculum Improvement Summary

MAE Fall Retreat

8/18/2025

**UtahState**University®

MECHANICAL AND AEROSPACE ENGINEERING

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# Outline

- 1. Where we are in the Continuous Improvement Cycle.**
- 2. Review of Mission Statement and Program Educational Objectives.**
- 3. Review of Course/SO Mapping and Assessment Tools.**
- 4. Status update of previous open actions and recent data**
- 5. Data collection for AY26.**
- 6. Looking Ahead to AY26 Reaccreditation Self-Study and Site Visit**

# CCIC Cycle Schedule

Activity	Cycle 1		Cycle 2		Cycle 3	
	AY21	AY22	AY23	AY24	AY25	AY26
Review of MS, PEOs, Pls	X		X		X	
Map educational strategies related to Pls	X				X	
Review mapping and identify where data will be collected	X				X	
Develop and/or review assessment methods used to assess Pls	X				X	
Collect data		X		X		X
Evaluate assessment data including processes		X		X		X
Report findings		X		X		X
Take action where necessary			X		X	

# Student Outcome Course Map

Student Outcome	MAE 1010	ENGR 3080	MAE 3340	MAE 3420	MAE 3440	MAE 3600	MAE 4400	MAE 4800/4810
SO 1 Problem Solving				R	E			
SO 2 Design	I		R					E
SO 3 Communication		E					E	E
SO 4 Informed Judgment	I/R					E		E
SO 5 Teamwork	I		R					E
SO 6 Experiments			R				E	
SO 7 Lifelong Learning								E

# Assessment Tools

- **Instructor Course Assessments (SO 1-6)**
- Graduating Student Survey
- Industrial Advisory Board (representing Alumni and Industry)
- Faculty Input – usually informal or discussions at Faculty Meetings. This should be more formal if we want to use it to make decisions.
- Alumni and/or Industry Surveys – We have done these in an ad hoc fashion previously with limited responses.

# Department Mission Statement

The Department of Mechanical and Aerospace Engineering provides each graduate with a foundation of knowledge and experience upon which to build successful careers in mechanical engineering, aerospace engineering, or other fields where a strong engineering background is required or desirable. Undergraduate programs emphasize mechanical engineering fundamentals and computer-based problem solving while teaching students to learn, synthesize, and communicate engineering information. Graduate programs emphasize research by the faculty with a high level of student involvement providing enhanced preparation for engineering practice, research, and education. Students, faculty, and staff are committed to excellence in learning, discovery, and engagement in an environment that fosters diversity and mutual respect.

# Program Educational Objectives

1. Graduates will succeed in entry-level engineering positions with mechanical or aerospace firms in regional, national, or international industries, as well as with government agencies.
2. Graduates will succeed in the pursuit of advanced degrees in engineering or other fields where a solid foundation in mathematics, science, technology, and engineering fundamentals is required.

# Current Open Improvement Actions

# SO 1 (Problem Solving) AY 24 Data

## Instructor Course Assessment:

Performance Indicator	MAE 3420		MAE 3440	
1.a	100	4.5	70%	3.4
1.b	100	3.75	70%	3.2
1.c	75	3.5	50%	2.7

**Student Self Assessments:** 93% meeting with an average level of attainment of 3.7

**(SO 1 Problem Solving) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (Target of 85% & 3.5)**

- a. Students interpret given information and correctly identify the problem to be solved.
- b. Students apply scientific and engineering principles that are appropriate for the required accuracy to formulate mathematical models of systems and/or processes.
- c. Students apply mathematical principles to obtain analytical or numerical solutions of mathematical models with the required accuracy, including the use of computer-based tools.

# SO 1 (Problem Solving)

- Data collection in AY 24 showed we were below our target of 85% and 3.5 for multiple performance indicators.
- This has been an area where faculty have expressed concern wrt student abilities but has not shown up in data collection previously.
- Our consideration of the “Complex Engineering Problems” has better clarified what our expectation is of students.
- Are fundamentals courses, like Fluids and Heat Transfer, appropriate for requiring and assessing students’ abilities to solve Complex Engineering Problems?
- *Computer-based* is mentioned in our Mission Statement and in PI 1.c, but we don’t require students use Computer-Based Tools.
- Ideas?

# SO 2 (Design) AY 2023 Action

AY22 data showed below target in Design, specifically related to *defining requirements and constraints and identifying appropriate standards*

**Action:** AY24 data showed we are still below target. Should we use the opportunity that the Freshman Experience is providing to move an early design course closer to the senior year?

**Result from AY24 data collection:**

Performance Indicator	MAE 3340		MAE 4800/4810	
2.a	90%	4.3	100%	4.8
2.b	80%	3.5	80%	3.4
2.c	NA	NA	90%	4.2
2.d	NA	NA	80%	3.7

Student Self Assessments: 87% meeting with an average level of attainment of **3.4**

**(SO 2 Design) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. (Target of 85% & 3.5)**

- a. Students produce clear and concise problem statements for design problems.
- b. Students identify realistic requirements and constraints through consideration of appropriate professional standards; public health, safety, and welfare; and global, cultural, social, environmental, and economic factors.*
- c. Students develop multiple design alternatives and use requirements and constraints to evaluate acceptability and desirability in an objective fashion.
- d. Students apply appropriate engineering principles to design and evaluate systems, components, and/or processes to manage risks while meeting design requirements and constraints.*

# SO 2 (Design) Summary

- Both the Instructor Course Assessments and Student Self-Assessments showed that students were not achieving our Target.
- This is the 2<sup>nd</sup> consecutive Data Collection Period where we have been below target.
- We are not assessing 2.c or 2.d in a 2<sup>nd</sup> course.
- This will remain an open action until additional data is collected showing that students are meeting our targets.
- What ideas do you have for how we can improve students' abilities in Design?

# SO 3 (Communication) AY 24 Data

## Instructor Course Assessment:

Performance Indicator	ENGR 3080		MAE 4400	
3.a	70%	3	100%	4.6
3.b	70%	3.4	NA	NA

**Student Self Assessments:** 95% meeting with an average level of attainment of 3.8

**(SO 3 Communication) an ability to communicate effectively with a range of audiences. (Target of 85% & 3.5)**

- a. Students write effectively on engineering topics using a format, including producing clear, complete, and accurate figures and tables, and a level of detail that is appropriate for both managerial and/or technical audiences.
- b. Students prepare and give effective oral presentations on engineering topics using a format, including producing clear, complete, and accurate figures and tables, and level of detail that is appropriate for both managerial and/or technical audiences.

# SO 3 (Communication)

- Data collection in AY 24 showed we were below our target of 85% and 3.5 for written and oral communication.
- This has been a common area of criticism from faculty and a point of emphasis from our IAB.
- Do we use consistent writing standards across the curriculum?
- Are we taking advantage of the Engineering Writing Center – having requirements in all courses that involve writing?
- Also, we are not assessing oral communication outside of ENGR 3080.
  - Would it be possible to add this into MAE 4800/4810?
  - I envision this could be done via survey/evaluation by the “customer” during the PDR and/or CDR

# SO 7 (Lifelong Learning) AY 2023 Action

In AY23 we voted to replace the Instructor Course Assessments of SO 7 with specific questions from the Graduating Student Survey.

**Action:** Changed our Assessment Method

**Result from AY24 data collection:**

Performance Indicator	Graduate Survey
7a. Graduate/Professional School Plans	44%
7.b Professional Licensure Plans	53%
7.c Student Organization Membership	43%
7.d Professional Organization Membership or Plans	33%
7.e Undergraduate Research Participation	26%

Student Self Assessments: 96% meeting with an average level of attainment of 3.9

**(SO 7 Lifelong Learning) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (Target of 30%)**

- a. Students plan to attend graduate or professional school.
- b. Students plan to pursue professional licensure.
- c. Students have been a member of a student organization.
- d. Students are or plan to be a member of a professional society.
- e. Students have participated in undergraduate research.

# SO 7 (Lifelong Learning)

- Data collection in AY 24 showed we were below our target of 30% participation in undergraduate research.
- This will remain an open action until we meet our target value.
- Is 30% what we think this should be?
- Should we also include other categories, like independent projects or honors capstones, in this category?

# **Looking forward to our AY26 Efforts and Reaccreditation Review**

# AY2026 Reaccreditation Timeline

- Instructor Course Assessments will be completed this year (Student Outcome Course Map on next slide).
- Draft of the Self-Study Report will be due in early 2026 and the final version by July 1, 2026 and will include our assessment and continuous improvement efforts through AY26.
- Site Visit will take place Fall 2026.

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# Miscellaneous ABET Information

- I will likely ask you keep all AY26 Course Documents but ABET no longer requires extensive materials. If you teach a Data Collection Course, I will ask you to keep your Samples that were used for the Assessments as well as all other student work in case the PEV asks to see it.
- Sampling is acceptable for large-enrollment courses. We previously used a minimum of 10 samples, but we should use a minimum of 20.
- Team-Based assignments are acceptable for assessments. (We have been using this approach in multiple areas)
- Assessments should be conducted frequently enough to assess every outcome for every student cohort. (We do this already)
- Most common shortcoming: Assessment/Evaluations not being used as inputs for Continuous Improvement. (We are good at this)