

# **AY 2022 Assessment Data and AY 2023 Actions**

**UtahStateUniversity<sup>®</sup>**

MECHANICAL AND AEROSPACE ENGINEERING

**UtahStateUniversity<sup>®</sup>**

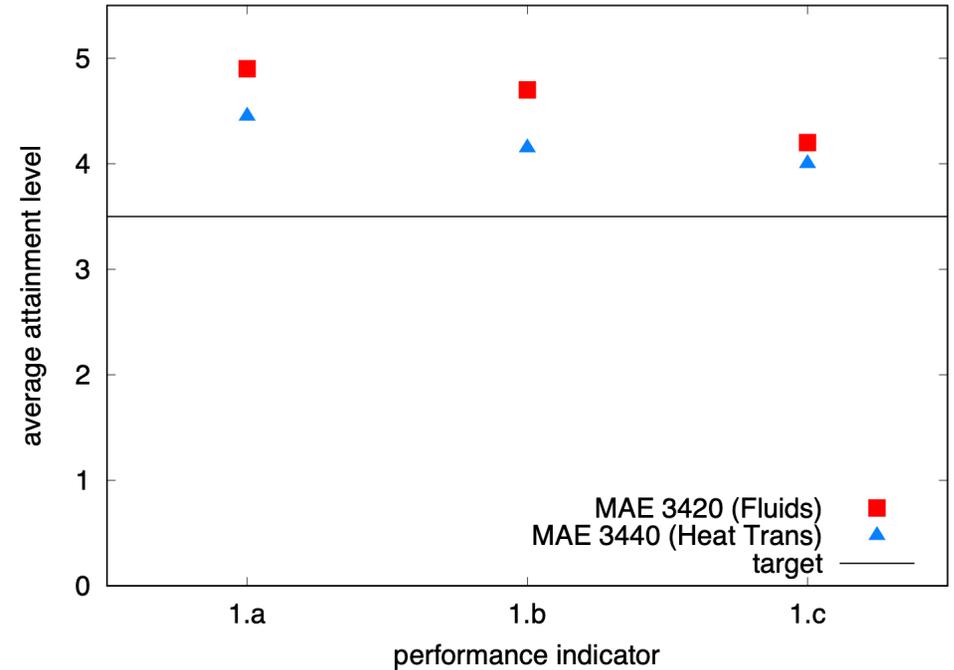
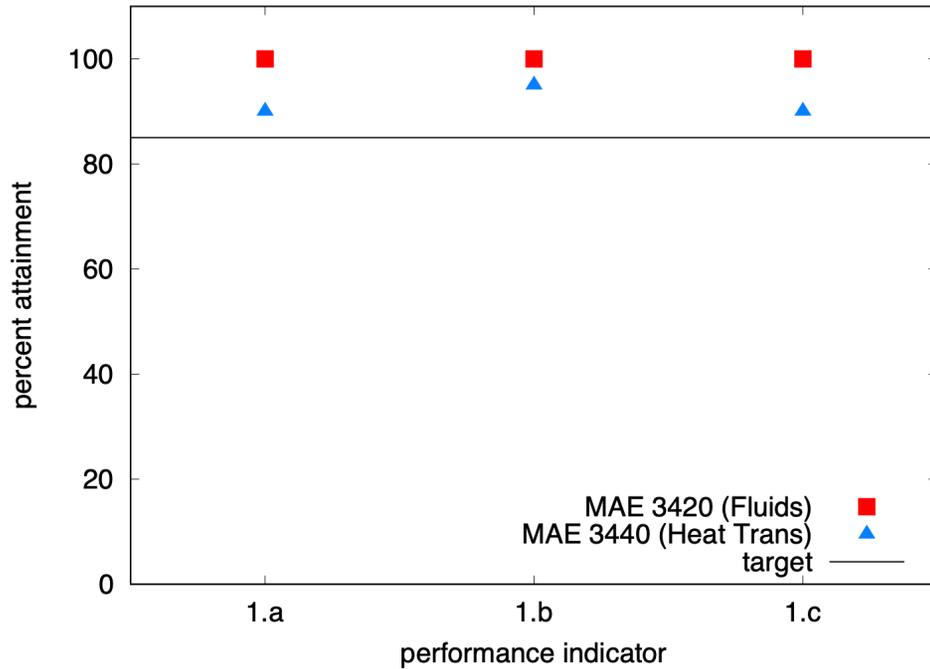
MECHANICAL AND AEROSPACE ENGINEERING

# Student Outcome 1 (Problem Solving) PIs

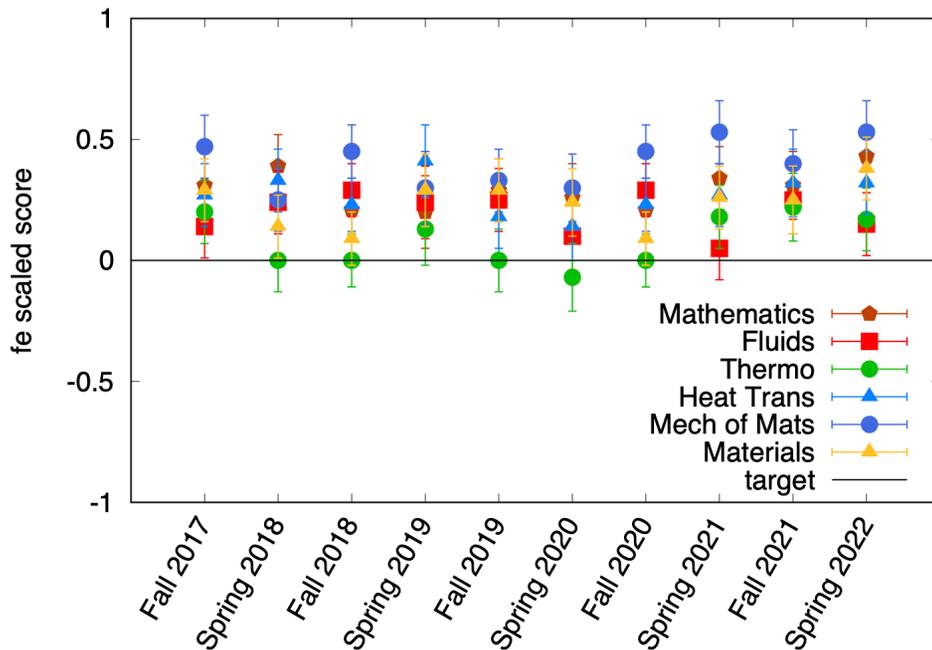
**(SO 1 Problem Solving) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics**

- 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.

# Student Outcome 1 (Problem Solving) ICA



# Student Outcome 1 (Problem Solving) Other



IAB mentioned the importance of programming

- They want to see us offer ONE programming language that is used throughout the program.
- More required credits dedicated to programming.
- The program needs a strong programming component.
- Also mention teaching our own Math.

# Student Outcome 1 (Problem Solving) Actions

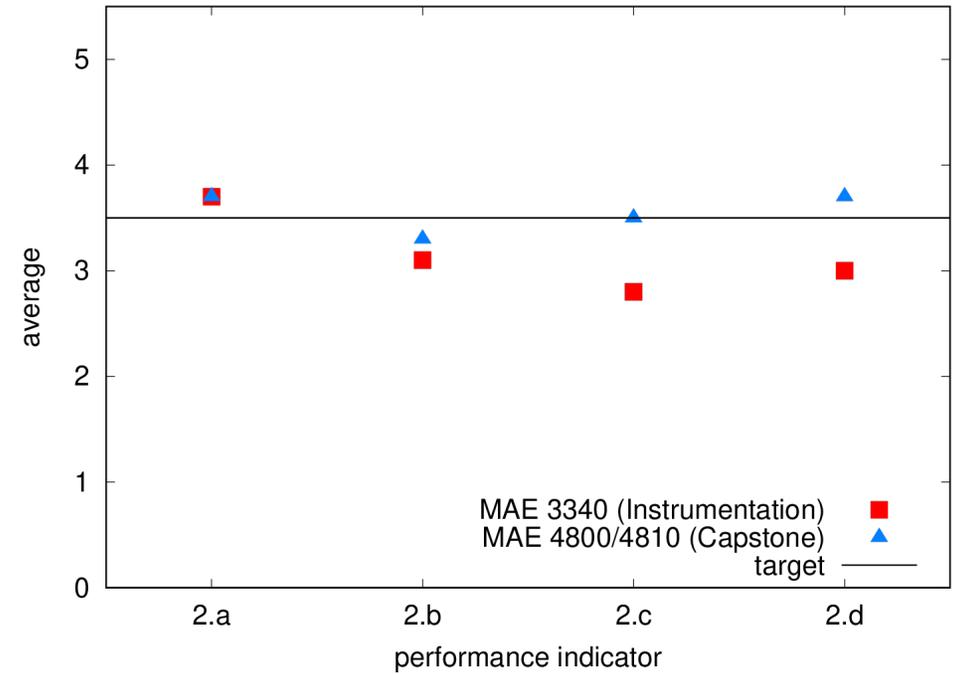
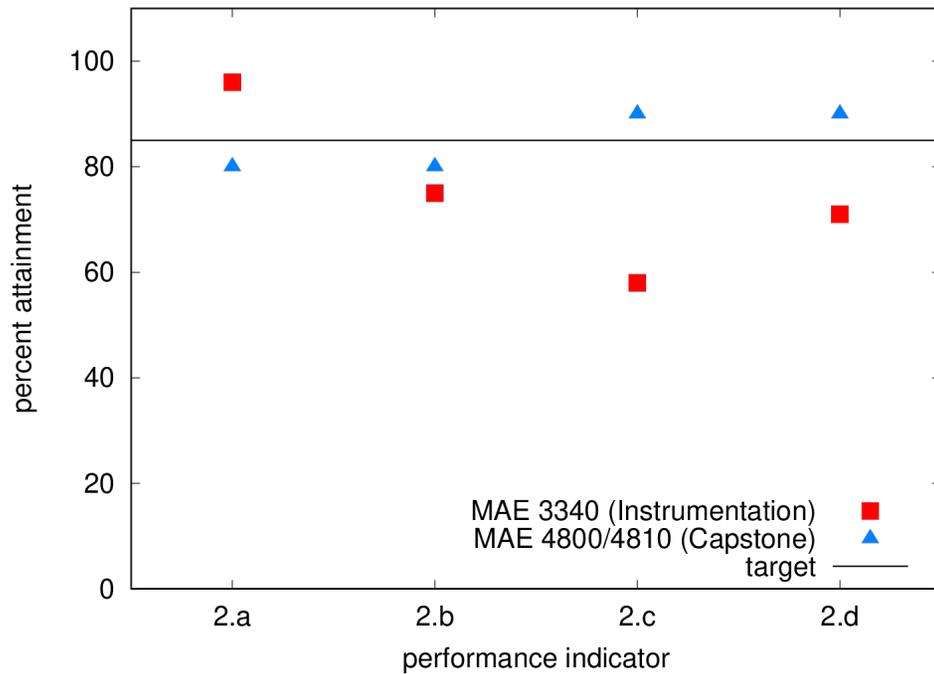
- No action required due to being above targets

# Student Outcome 2 (Design) PIs

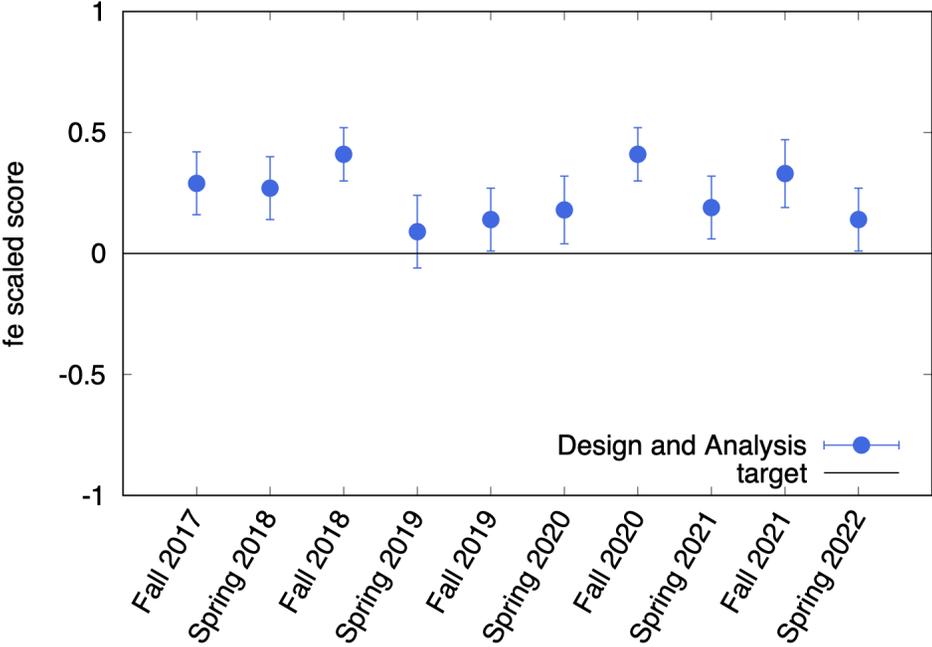
**(SO 2 Design) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors**

- 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.

# Student Outcome 2 (Design) ICA



# Student Outcome 2 (Design) Other



# Student Outcome 2 (Design) Actions

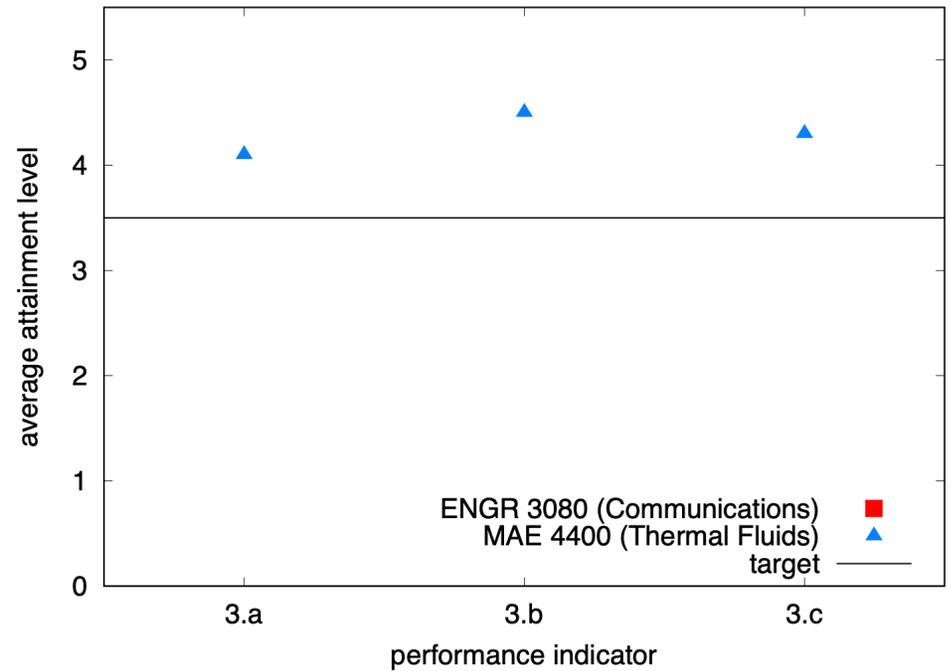
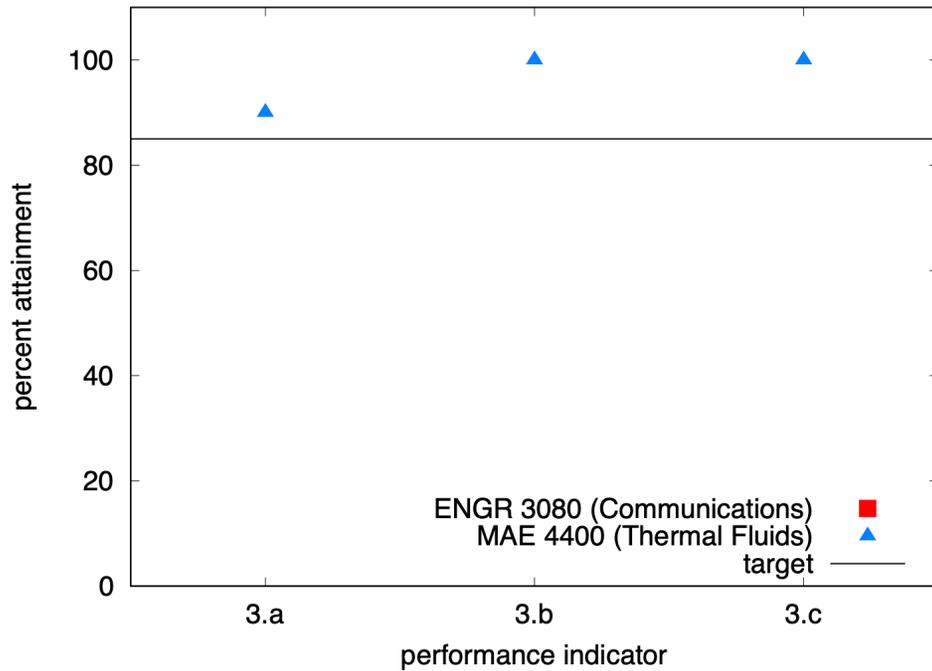
- Action required due to being below targets

# Student Outcome 3 (Communication) PIs

**(SO 3 Communication) an ability to communicate effectively with a range of audiences**

- a. Students produce clear, complete, and accurate technical graphics.
- b. Students write effectively on engineering topics using a format and level of detail that is appropriate for the intended audience.
- c. Students prepare and give effective oral presentations on engineering topics using a format and level of detail that is appropriate for the intended audience.

# Student Outcome 3 (Communication) ICA



# Student Outcome 3 (Communication) Other

IAB Letter mentions the importance of graduates to be able to communicate, specifically emphasizing the following:

- Briefing Papers, Power Point Styled Presentations and other mediums.
- Students need more opportunities to hone these skills in their undergraduate experience – like in other individual or team projects.

# Student Outcome 3 (Communication) Actions

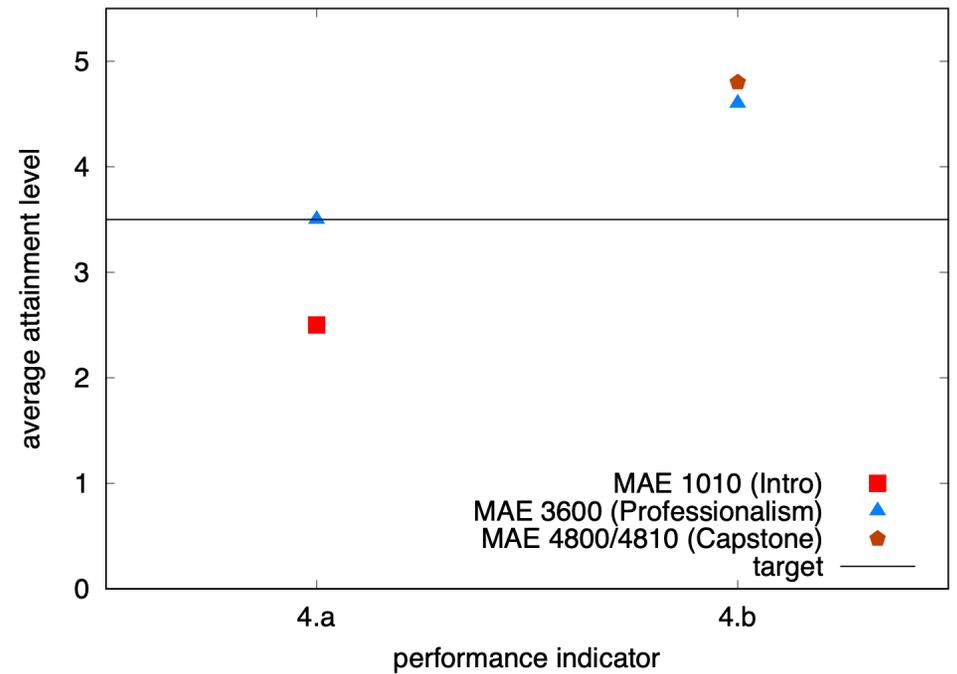
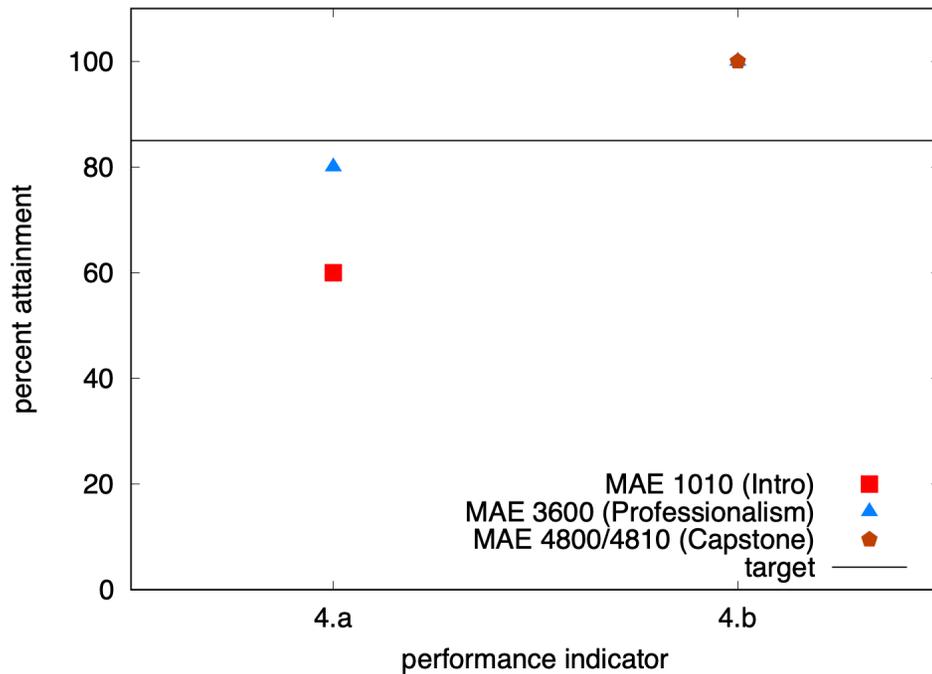
- No action required due to being above targets

# Student Outcome 4 (Informed Judgment) PIs

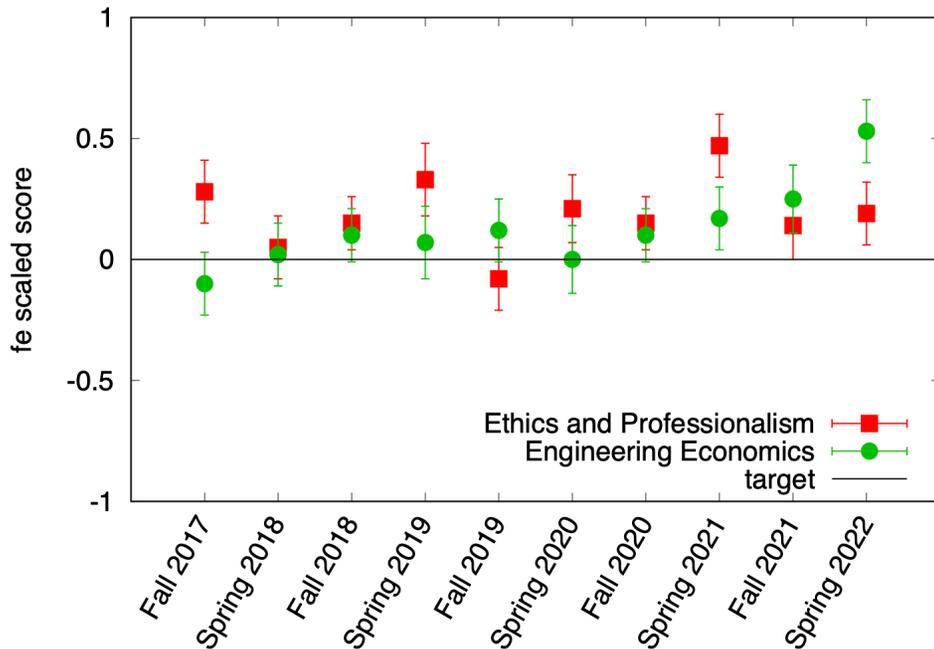
**(SO 4 Informed Judgment) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts**

- a. Students understand and evaluate ethical and professional dimensions in engineering situations by applying the ASME Code of Ethics of Engineers.
- b. Students understand and evaluate the global and local impact engineering solutions have on the economy, the environment, and society.

# Student Outcome 4 (Informed Judgment) ICA



# Student Outcome 4 (Informed Judgment) Other



# Student Outcome 4 (Informed Judgment) Actions

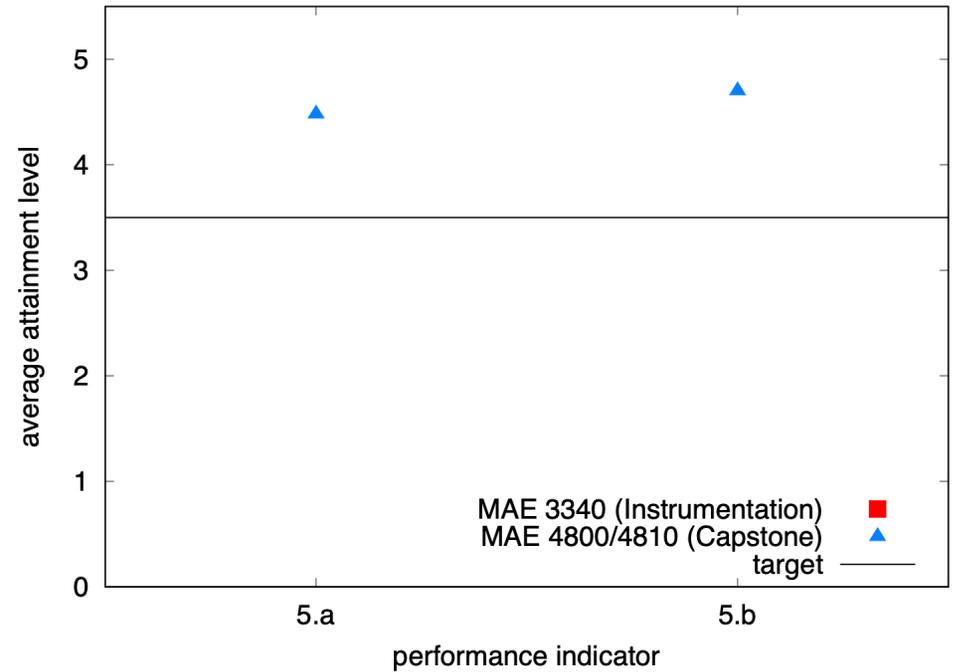
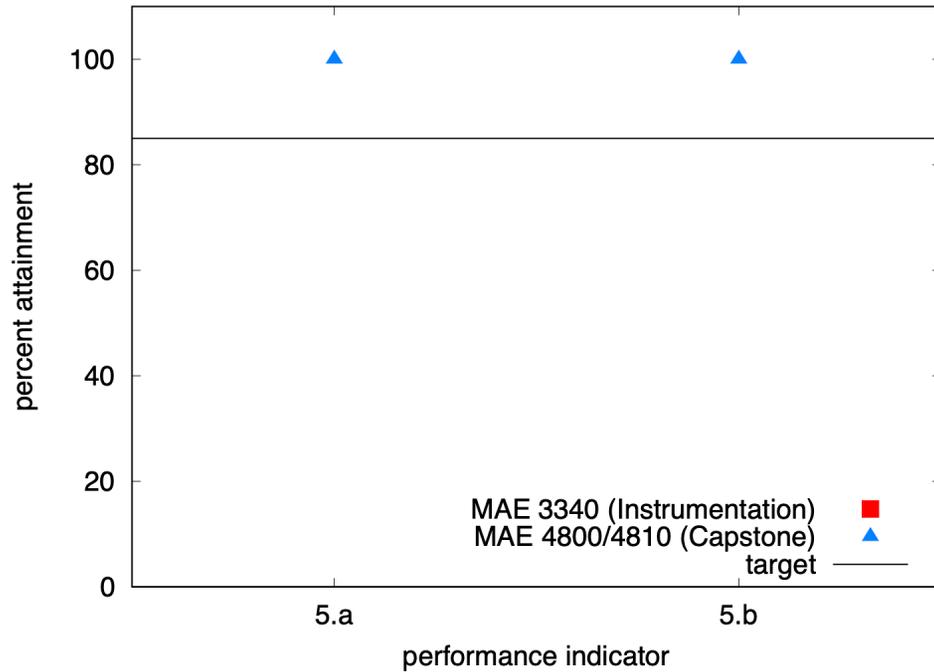
- Action required due to being below targets

# Student Outcome 5 (Teamwork) PIs

**(SO 5 Team Work) 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**

- a. Students act professionally in a team setting by defining mutually agreed upon team roles and by fostering a collaborative and inclusive environment.
- b. Students work together to establish goals and plan tasks to meet project objectives.

# Student Outcome 5 (Teamwork) ICA



# Student Outcome 5 (Teamwork) Actions

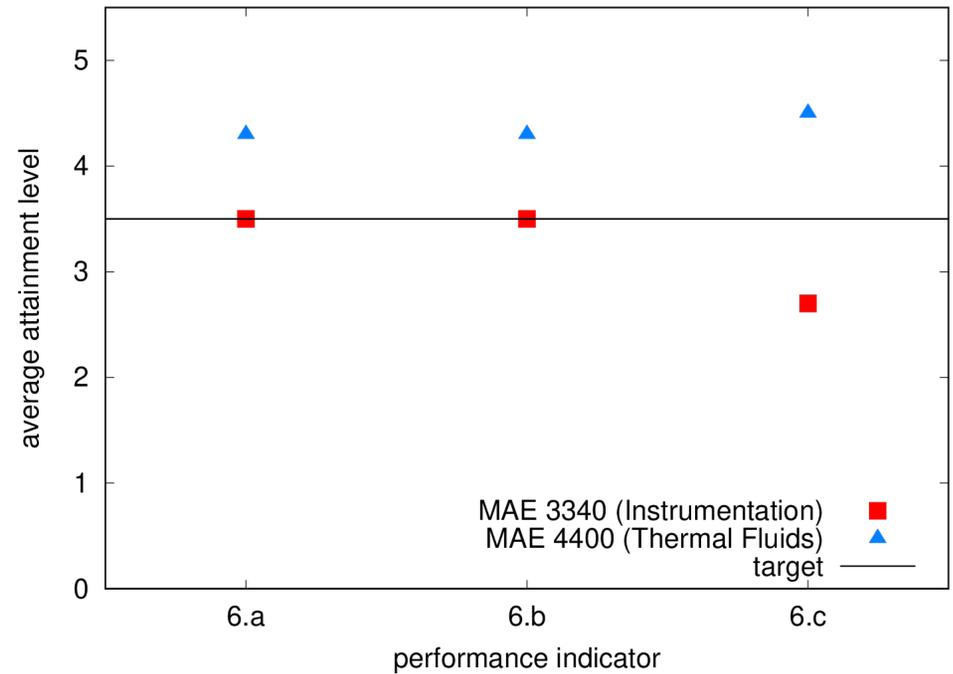
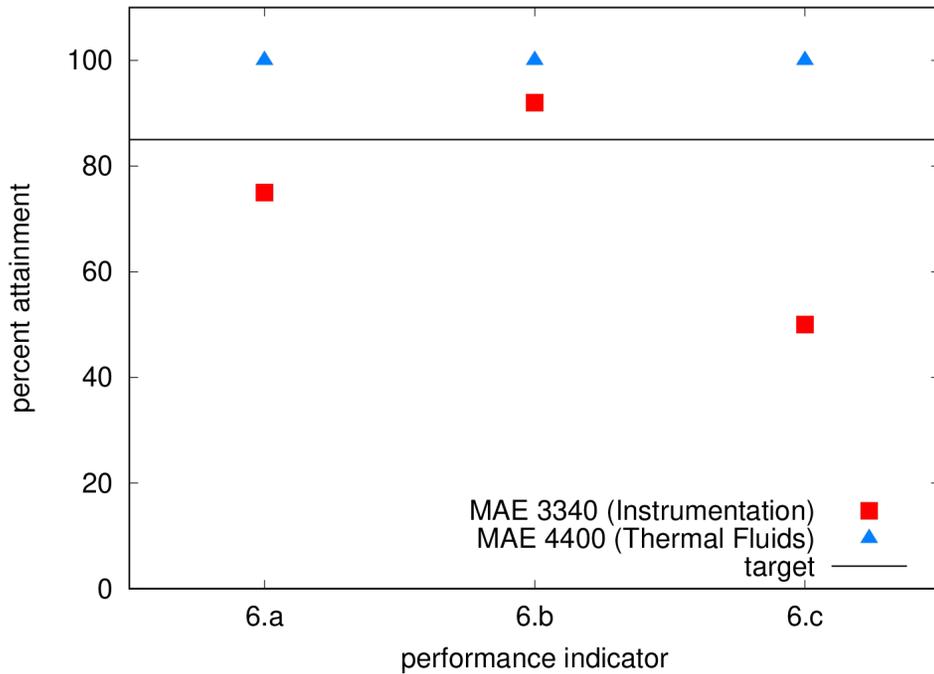
- No action required due to being above targets

# Student Outcome 6 (Experiments) PIs

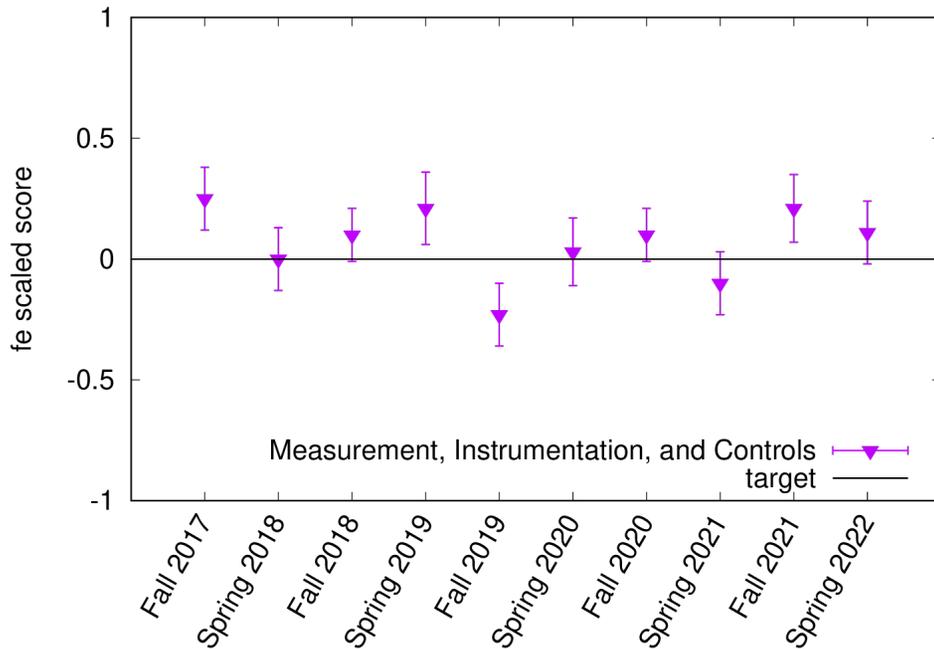
**(SO 6 Experiments) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions**

- a. Students develop appropriate experimental procedures for obtaining measurements of a desired variable.
- b. Students conduct experiments by following experimental procedures and operating instrumentation in a manner appropriate for the required accuracy.
- c. Students compare experimental results with appropriate models; explain differences between experimental results and model results, including measurement uncertainty; and develop meaningful conclusions.

# Student Outcome 6 (Experiments) ICA



# Student Outcome 6 (Experiments) Other



# Student Outcome 6 (Experiments) Actions

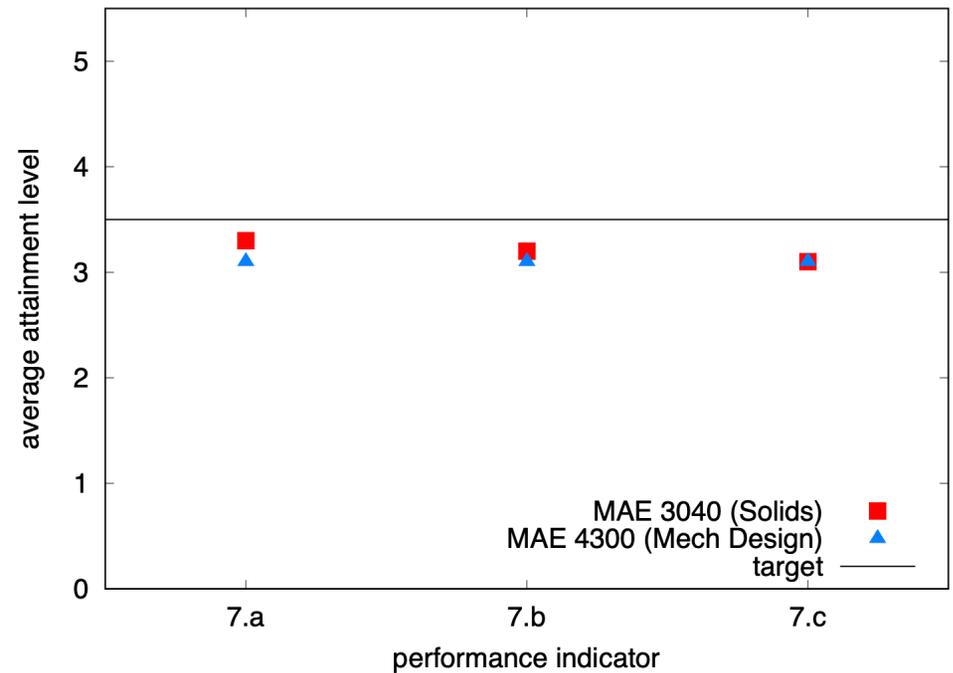
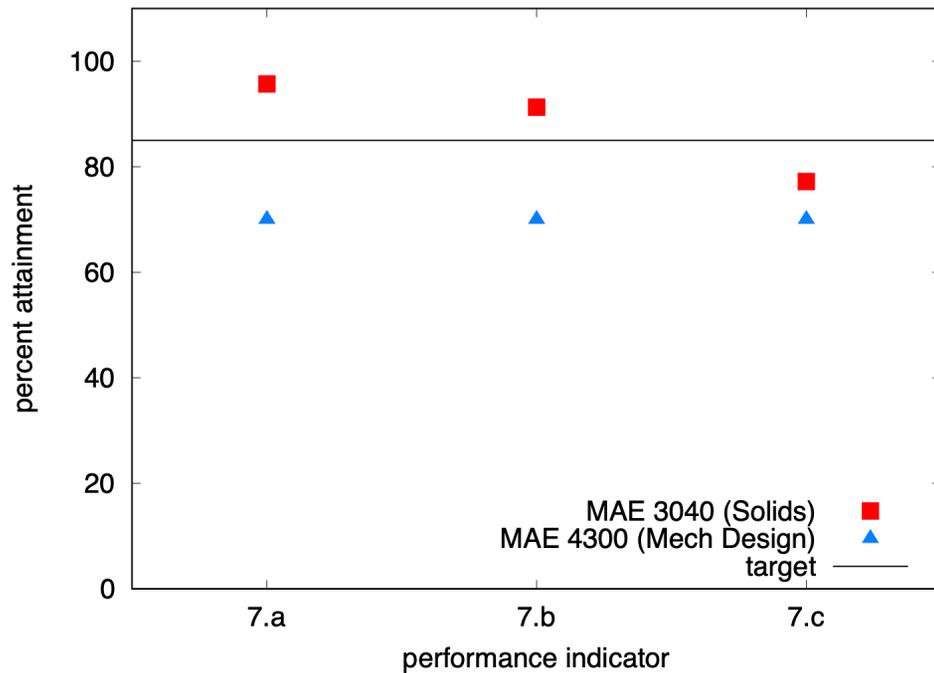
- Will review during next assessment data collection period

# Student Outcome 7 (Lifelong Learning) PIs

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

- a. Students recognize gaps in their skills and knowledge.
- b. Students acquire reliable resources to supplement their skills and knowledge.
- c. Students apply new skills and knowledge to an engineering problem in an independent or unstructured setting.

# Student Outcome 7 (Lifelong Learning) ICA



# Student Outcome 7 (Lifelong Learning) Actions

- Action required due to being below targets

# Observations/Questions from AY 2022 Data

- Instructor Course Assessment results may be too generous.
  - Rubric categories: *Lacking, Developing, **Competent, Proficient, Mastery***
  - Are the problems/assignments representative of our expectations? If so, are students meeting or exceeding?
  - I chose arbitrary targets of 85% attainment and average of 3.5. Are these appropriate?

# CCIC Cycle Schedule

Activity	Cycle 1		Cycle 2		Cycle 3	
	AY21	AY22	AY23	AY24	AY25	AY26
Review of MS, PEOs, PIs	X		X		X	
Map educational strategies related to PIs	X				X	
Review mapping and identify where data will be collected	X				X	
Develop and/or review assessment methods used to assess PIs	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	

# 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.

# Instructor Course Assessment Schedule

Course	AY 2021		AY 2022		AY 2023		AY 2024		AY 2025		AY 2026	
	F20	S21	F21	S22	F22	S23	F23	S24	F24	S25	F25	S26
<b>MAE 1010*</b>												
<b>MAE 3040**</b>												
<b>ENGR 3080*</b>												
<b>MAE 3340*</b>												
<b>MAE 3420**</b>												
<b>MAE 3440**</b>												
<b>MAE 3600</b>												
<b>MAE 4300</b>												
<b>MAE 4400*</b>												
<b>MAE 4800/4810</b>												

# Summary of AY 2023 Actions

- Action required for SO 2 (Design), SO 4 (Informed Judgment), and SO 7 (Lifelong Learning)
- These actions will need to be determined this AY and implemented before next AY so we can capture any improvements in next data collection
- We will also use this AY to review/revise any processes, rubrics, etc.
- Should we include Students in our list of Constituencies?