MAE Faculty Retreat ABET Business
August 18, 2020

Items:
1) Department Mission Statement Review
2) Department Program Educational Objectives Review
3) ABET Virtual Visit
4) Faculty Focus-Area Programmatic Evaluation of Assessment Data

CIC Focus Areas:
- Aerospace (dynamics, controls, navigation, etc.)
- Design & Experimentation (lab courses)
- Solid Mechanics
- Thermal Fluids

1) Department Mission Statement Review

Undergraduate Curriculum Committee (UCC) discussion:

We don’t mention our intent to provide students with experience in applying fundamental science knowledge and engineering principles/theories in our mission statement.

This seems to be an oversight, as the application of theoretical principles is the heart of engineering (what separates engineering from science). One possible change is shown below:

The Department of Mechanical and Aerospace Engineering provides each graduate with a foundation of knowledge and application 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.

This change, however, was tabled after the Industrial Advisory Board recommendations were reviewed, prompting the following questions:

- What is our “brand?”
- What do we see as the reasons why students would choose our program over other options?
For now, the UCC recommends approving the Department Mission Statement as-is, but believes that the answers to these questions should be reflected in our mission statement going forward. Discussion will take place through Continuous Improvement Committee focus area groups.

**Department Mission Statement (for faculty vote)**

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.

**2) Department Program Educational Objectives Review**

Undergraduate Curriculum Committee (UCC) discussion:

We can remove “regional, national, or international” since this is everything. We will also be reviewing and potentially revising this as a part of our 5-year plan, probably led again by the UCC and CIC.

**Program Educational Objectives**

Expanding upon the mission statement, the Mechanical and Aerospace Engineering Department lists two specific undergraduate Mechanical Engineering Program Educational Objectives. These objectives are fully consistent with Utah State University's mission as a land-grant institution.

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. MAE’s Program Educational Objectives are:

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 and non-profit 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.
3) Faculty Focus-Area Programmatic Evaluation of Assessment Data

1) ABET Assessment Data Review

a. Graduating Student Assessment – **No surveys were sent out for ABET due to COVID-19 confusion**

b. FE Exam Results (Fall 2018 – Spring 2020) – Plots below and supplemental information can be found in 01.FE Results F18.pdf, 02.FE Results S19.pdf, 03.FE Results F19.pdf, 04.FE ResultsS20.pdf, 05.MAE_FE_PF_data.xlsx

![Graphs showing FE ratio score and fe scaled score for various areas of study over different semesters from Spring 2014 to Spring 2020.](image)
c. Industrial Advisory Board – Brief highlights from 07.2020 MAE Advisory Board Letter.pdf are below:
   i. Acknowledge efforts in hiring, changes to admissions requirements, and the increasing Professor of Practice positions.
   ii. Acknowledge positive student/faculty interaction and relations.
   iii. Acknowledge the newsletter for connecting current and former students. Want it to continue.
   iv. Acknowledge MAE 1010 having a positive impact on preparing students for the program.
   v. Want to continue the discussion about programming language. They want to hear from our students, specifically students that are more experienced in programming.
   vi. Emphasize maintaining interdisciplinary activities and projects in the program.
   vii. Recommendation #1 – Develop a strategy to sustain and grow faculty positions.
   viii. Recommendation #2 – Better define and strengthen the relationship with the Space Dynamics Laboratory.
   ix. Recommendation #3 – Focus on continuous curriculum improvement.
   x. Recommendation #4 – Develop and strengthen an approach to patent protection and commercialization

d. Student Course Assessment – IDEA Master tab of 08.Compiled Data Fall 2019 – Spring 2020.xlsx
   Changes to the IDEA survey caused problems with data collection in Fall 2019. Spring 2020 data was all above target values of 3.

e. Instructor Course Assessment – Instructor Master tab of 08.Compiled Data Fall 2019 – Spring 2020.xlsx
   All ratings were at 3 or above except MAE 1010 in both the fall and spring had Performance indicator 2a rated at a 2.

PI 2a: Students produce clear and unambiguous needs statements for design projects. Examples of Good, Medium and Poor that resulted in the rating of 2 are found in the highlighted sections on pages 151 and 156, 192 and 197, and 236, 242, and 243, respectively, of 09.MAE-1010_Fall_2019.pdf and in the highlighted sections on
2) Update on AY-2019 Faculty Focus-Area Evaluations & Initiatives

Mathematics Proficiency
- Obtained example problems students struggle with from David Geller for tracking.
- Discuss the possibility of instituting a mathematics exam for entry into the professional program with the Dean’s Office (and advising center) and determine future actions.
- Looked into the reasons why the engineering mathematics course was discontinued and whether it would be possible to reinstate it in some form.
- Identify potential mathematics department faculty to collaborate with.
  - Asked to delay this action by the college as other college-level actions are already in-progress.
- Meet with mathematics department faculty, provide examples, define strategy, and determine future actions.
  - Asked to delay this action by the college as other college-level actions are already in-progress.

Understanding Math in (and Significance of) Derivations
- Met with Intro to Mech. Engineering instructor to plan additional function visualization and physics examples into course curriculum.
- Contacted Space Dynamics Laboratory about providing guest lecturer to discuss the importance of understanding derivations and mathematical function significances.
- Attempted to schedule and finalize related lecture(s).

Physics Understanding – Gravitation Laws / Potentials
- Met with Intro to Mech. Engineering instructor to plan additional function visualization and physics examples into course curriculum.

FE Examination Target Values
- Generate CIC proposal for new FE subject area target values.
  - Ongoing effort.
- Vote-in new FE subject area target values in spring department meeting.
  - Ongoing effort.
CIC Focus Area Leaders Discussion Guide

What is our “brand” at USU? Why should/would students choose our program over alternatives? What changes would you suggest making to the mission statement or program educational objectives to reflect/emphasize our brand?

Student strengths (cite relevant assessment sources where possible):

Potential improvements (cite relevant assessment sources where possible):

Proposed action(s):

Proposed method to evaluate the effect of the action:

Action items (who, what, when):