

Undergraduate Curriculum Committee Academic Year 2014-2015

MAE Department Utah State University

August 6, 2015 10:30 a.m.

1) Senior Surveys A-K

All of the student survey averages for the A-K scores are above 3.0

2) FE Exam Results

From the limited data we have received from the FE results on the new format only Engineering Economics is consistently below the national average. The students taking the FE were not enrolled in the modified professionalism course that has increased the lecture time on engineering economics.

3) Senior Exit Interviews

Senior exit interviews included comments about

- The negative effects of large classes
- The lack of mfg. courses in the curriculum
- The need for more instruction in geometric dimensioning and tolerancing

The department has opened a position for a professor of practice to teach Capstone Design.

The department has split the solid mechanics course and plans to split more of the courses.

The committee discussed increasing the ENGR 1200 Engineering graphics course to 3 credits and adding more GD&T instruction. We need a proposed syllabus to make a motion to present to the faculty.

4) Advisory Board

The advisory board recommends that we

- Reduce class sizes.
- Create an introduction to engineering course.
- Add instruction relating to design and manufacturing topics.

In regards to the introduction to engineering course, the committee is generally positive to the idea. The Associate Dean has proposed a book and a syllabus for the course. The committee expressed interest if the college is willing to teach the course. There is concern on where the credits would be removed. There was discussion of combining the advanced dynamics course with the mechanical vibrations course.

5) IDEAS A-K's

Review of the data obtained from the IDEAS A-K surveys revealed some scores below 3. However, it was found that criteria were not addressed in the course. It is proposed that we adjust the survey questions to match the topics covered in the class. Only enough classes would be included to cover all of the A-K data.

6) Feedback from 2014 Changes

CS 1400 C Programming

MAE faculty met with CS faculty to review the change to require CS1400 instead of MAE 3200. The following is a summary of their discussion.

Discussion Items:

1. Overall, MAE faculty was very happy with the quality of instruction in CS 1400 as an introduction to C++ programming. In particular, the transition from Fortran to C++ for MAE undergraduates was quite smooth.
2. MAE faculty suggested more of an emphasis on finite precision computer arithmetic using float, double, and long double data types. These data types are primarily used in engineering numerical methods, and MAE undergraduates require a solid understanding of precision, accuracy, and round-off error using these data types.
3. MAE faculty suggested adding one or two engineering oriented application problems to CS 1400, such as hydrostatics or calculations with the Bernoulli equation from fluid dynamics. The purpose of adding such applications would be to expose the students to the idea that computer programs can be effective tools to solve engineering problems arising from the physical world.
4. MAE faculty suggested that allocatable memory using the "new" statement be covered in CS 1400. CS faculty thought this would be a more advanced topic and difficult to cover in the time allotted. Consequently, MAE faculty proposed using the "Eigen" library in C++ to handle array operations. This would not require CS faculty to cover allocatable arrays, and could be covered in just a few minutes by MAE faculty at the beginning of MAE 3210.

Conclusions and Outcomes:

1. Overall, the discussion was fruitful and should lead to a better CS 1400 experience for MAE undergraduates.
2. Specifically, CS faculty were very optimistic about incorporating Discussion Items 2 and 3 above into CS 1400.
3. MAE faculty will likely cover array operations using the "Eigen" library in C++, which will not require new material be covered in CS 1400.

ENGR 3080 Technical Writing for Engineers

Student comments and faculty observations have been positive about this change. The advisory board complimented the department in their report for adding this course.

7) Action Items for Curriculum Committee

- Review the A_K Ideas assignments for the courses
- Obtain a syllabus for the proposed change to ENGR 1200 Engineering Graphics
- Further explore the proposed addition of an Introduction to Engineering course and propose a neutral credit exchange.

8) Enrollment Data

The committee examined the MAE enrollment data. Although enrollment in the junior year is down from the record high numbers in 2014-15. Committee members are very concerned about the size of classes and negative impact on enrollment. Further measures should be taken to reduce the class sizes.