2008-2009 Summary of Curricular Changes to Mechanical Engineering Program

- ME 2 – Introduction to ME: We carefully examined the strengths and weaknesses of the existing ME freshman experience and determined that the ME 1 A/B/C sequence did not adequately prepare our students for the challenges of the subsequent courses. As a remedy, we developed a new four-unit course, ME 2, which provides a comprehensive overview of mechanical engineering. This course teaches engineering problem solving skills without utilizing calculus, and is intended to provide a framework to help students connect concepts in subsequent courses. The ME Board of Advisors (BOA) that includes the industry representative component of our stakeholders expressed their enthusiasm for this change at our Annual BOA Meeting held on April 24, 2009. This four unit course is scheduled for deployment in AY 2009-2010. ME1A/B/C will no longer be required.
- ME 18 – Introduction to Engineering Computation: The course was changed from 2 units to 3 to absorb material from ME 1C (basic MATLAB programming) thus providing a more comprehensive introduction to engineering computation.
- ME 174 – Machine Design: ME 130 (Kinematics) was eliminated as a required course and replaced with ME 174. The latter covers strength-based design, an essential mechanical engineering topic that was absent from the curriculum.
- BIOL 003: This course was eliminated as a required course as it did not contribute material that is essential to the major. Now, only BIOL 005A and BIOL 005L which focus on cell and molecular biology are required.
- To help ME freshman stay connected with their major, the normal sequence of course offerings will be: ME2 in the winter quarter of the freshman year, followed by ME9 in the spring quarter.

These changes were implemented based on inputs from our ABET assessment system, course and alumni surveys, and on the input received from BOA. The changes are part of our efforts to keep the program up to date and to base our program on the needs of our constituencies. Specifically, the changes to the freshman curriculum (replacement of ME 1 A/B/C with ME 2) were motivated by the desire to increase student success in subsequent courses, beginning with statics, which is taken in the sophomore year. Many of our students struggle in statics. The inclusion of ME 174 in the required curriculum addresses deficiencies that were apparent in student performance in senior design, ME 175 B/C. The changes to ME 18 were motivated primarily by the need to include material previously covered in ME 1C. BIOL 003 was dropped from the curriculum to accommodate the increased number of units from the other changes.

Aside from these curricular changes, some additional changes have been introduced to help with our ABET assessment process.

- We developed and implemented a “course stewards” program in which each core undergraduate course has a steward who helps maintain ABET materials, best practices, instructional materials, course scope/topics, etc. The course steward

will be instrumental in the ABET process and will serve as a point of contact for other instructors teaching the course.

- Freshman Mentoring: We developed a new system for freshman mentoring. The system relies on an iLearn website for communication with students. Mentoring occurs in group sessions in which mentors provide formal presentations covering topics such as techniques for success and career development. Sessions also include discussion periods, with refreshments, designed to engage students and build a sense of community.
- Town hall meeting: In the Spring of 2009, the Undergraduate Program Committee Chair held a meeting with representatives of the various mechanical engineering cohorts to identify areas of potential improvement for the ME program. This feedback will be addressed by the committee in 2009-2010.

Specific actions that were taken to improve our program are:

- Quarterly training of Teaching Assistants. The TA's meet with the ABET Committee Chair and review tasks such as developing ABET course assessment matrix based on course objectives, identifying designated tasks (ex: selected assignments/labs, midterms, project, final exam) using which outcomes will be assessed, etc.
- Starting in the spring quarter of 2009, all TA's are required to enroll in 1 unit of ME302 (Apprentice Teaching). TA's learn about teaching methods/best practices, etc. They communicate with the Department Chair, ABET Committee Chair, and Graduate Advisor via iLearn.
- Annual online survey of program alumni was conducted. Survey results informed us about how our alumni are progressing in their careers and gave us guidelines for future program improvements. Specific program enhancements suggested by alumni include invitation of alumni as seminar speakers, stress more on communication skills, teach more on design parts (this is mostly taken care by introduction of ME174), teach more engineering ethics, insist on fundamentals, etc. This input will be used for curricular changes during next year.