TO: Office of Academic Program Assessment, Office of Academic Affairs

FROM: Susan L. Holl, Chair

SUBJECT: BSME 2012-2013 ANNUAL ASSESSMENT REPORT

1. As a result of last year's assessment effort, have you implemented **any changes for your assessment** including learning outcomes, assessment plan, assessment tools (methods, rubrics, curriculum map, or key assignment etc.), and/or the university baccalaureate learning goals?

a. If so, what are those changes? How did you implement those changes?

b. How do you know if these changes have achieved the desired results?

c. If no, why not?

The assessment plan for the BS ME program is focused on program quality and improvement. It is patterned on the requirements of our external accreditation body, ABET. Assessment includes program and course level outcomes and both direct and indirect measurements are used. We collect data from students, faculty, alumni, and industry constituencies.

Using the feedback from the University Office of Academic Program Review we have initiated conversations about how to better assess the program's learning goals. This will include investigation of rubrics in addition to the ones we have developed consistent with the ABET guidelines and rubrics to assess the University outcomes. We have also begun to narrow our programmatic discussions to focus on GE and major requirements to make sure we maintain a balanced program and correctly identify all overlaps between the major and GE.

The only specific change to our assessment program we were able to make during Spring 2013 is an initial response to the feedback from the University Office of Academic Program Review and Assessment. The faculty will review and amend the BS ME assessment plan to include the University level requirements. One specific programmatic outcome, oral communication, was selected to evaluate during Spring 2013.

The BS ME program requires a two-semester senior project. These are complex team projects which require significant interpersonal communication among team members, with faculty members, and with industry collaborators and many formal presentations. All Senior Project students participate in evaluation of presentations, as do faculty, alumni and industry partners. The data collected in Spring 2013 will be used to develop a baseline evaluation.

The desired result is to have all students reach the "good" to "excellent" level of oral communication by the time they graduate at the end of the senior project. This would require a score of >3.0 from all respondents for all presentations using the following rubric for oral technical communication:

ORAL	Unacceptable	Satisfactory	Good	Excellent
Communication	1	2	3	4
Present technical details of a final design with drawings, a report and a presentation.	Speaking and presentations do not clearly convey their work	Speaking and presentations convey some of the details of their work, but lack clarity or are incomplete.	Speaking and presentations convey the most important the details of their project at a satisfactory level.	Speaking and presentations clearly convey the details of their project at a professional level.

2. As a result of last year's assessment effort, have you implemented **any other changes at the department**, the college or the university, including advising, co-curriculum, budgeting and planning?

a. If so, what are those changes? How did you implement those changes?

b. How do you know if these changes have achieved the desired results?

c. If no, why not?

Our assessment efforts indicate that all constituencies are satisfied with the quality of the program we provide – the knowledge, skills, and dispositional qualities of our graduates. The number of majors in the BS ME program has increased significantly and we continue to have a satisfactory graduation rate. In addition to providing a comprehensive BS ME program we have been focused on reducing the number of units in our program while maintaining and improving the quality of our graduates.

Beginning in the 2009-10 year we implemented a major curriculum change that reduced the number of units from 137 to 129. We have continued to explore mechanisms to further reduce units and beginning in Fall 2013 we will have reduced to 128.

During the 2012-13 year we have been exploring the overlap between the GE learning goals and the program learning goals to evaluate if there are redundancies. We are working with AA and the Senate to determine if there can be further program reductions.

3. What PROGRAM (not course) learning outcome(s) have you assessed this academic year?

We assessed the following programmatic learning outcome:

Will apply creativity in the design of systems, components, processes, and/or experiments and in the application of experimental results, working effectively on multi-disciplinary teams

4. What method(s)/measure(s) have you used to collect the data?

Graduating senior exit interviews, alumni and industry interviews, results from the FE exam, and Senior Projects evaluations are used to evaluate this learning outcome.

5. What are the criteria and/or standards of performance for the program learning outcome?

The following rubric is used in the Senior Projects to evaluate this program outcome.

	Apply Creativity	Unacceptable 1	Satisfactory 2	Good 3	Excellent 4
1)	Transform a general project concept into an explicit set of functions, constraints, and objectives.	Students cannot create functions, constraints or objectives from their general project concept.	Students create functions, constraints and objectives that are significantly lacking because they are incomplete, unattainable, and/or irrelevant.	Students create functions, constraints and objectives that are appropriate for their project concept.	Students create functions, constraints and objectives that capture the essence of their project concept and they articulate them in clear, concise and quantifiable ways.

 Create, analyze and evaluate design alternatives. 	Students do not adequately brainstorm or document design alternatives.	Students consider some alternatives, but omit important options, fail to document the choices adequately or do not describe their decision making process.	Students consider and document an adequate number of alternatives, and they describe their decision making process.	Students clearly explain the alternatives, constraints, criteria and metrics for each design decision.
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6. What data have you collected? What are the results and findings, including the percentage of students who meet each standard?

- a. In what areas are students doing well and achieving the expectations?
- b. In what areas do students need improvement?

Selected faculty groups conducted exit interviews with 80% of the graduating seniors, we conducted interviews with 15 industry and alumni representatives and evaluated the feedback from the Senior Project presentations.

100% of the graduating seniors are able to satisfactorily take a general project concept and create a functional device considering constraints and alternatives. 30% are able to complete these tasks at an excellent level.

More students should be able to meet the requirements for an excellent evaluation in the areas of taking conceptual projects to actual designs and devices. We should provide more opportunities throughout the curriculum for students to work in teams and to work from general conceptual descriptions to create specific functional devices.

7. As a result of this year's assessment effort, do you anticipate or propose any changes for your program (e.g. structures, content, or learning outcomes)?

a. If so, what changes do you anticipate? How do you plan to implement those changes?

b. How do you know if these changes will achieve the desired results?

We should provide more opportunities throughout the curriculum for students to work in teams and to work from general conceptual descriptions to create specific functional devices. Faculty will work in their area/discipline groups to evaluate where curriculum modifications can be made to make more opportunities for team work.

Additionally we will work to have students better understand the relationship between the foundational courses and the upper division courses by modifying course assignments to more explicitly incorporate foundational and pre-requisite materials.

We will have achieved the desired result when we see all our graduates able to apply all their knowledge in a creative and effective manner.

8. Which program learning outcome(s) do you plan to assess next year? How?

Will communicate effectively through speaking, writing, and graphics, including the use of appropriate computer technology

We will continue to evaluate student work from courses at various levels, (Engr 6, Engr 45, ME 180, ME 190/191) by having students, faculty, alumni and industry evaluations of culminating projects.