Review of the Department’s Constituencies and The Plan for Soliciting and Incorporating their Input

Currently defined constituencies (From March 2000 Assessment Plan)
Our program constituents include the following:
- Students
- Students’ Families
- Employers of Graduates
- Program Alumni
- Ohio Citizens
- Mechanical Engineering Profession
- Ohio University Faculty

Definitions and key considerations for reviewing and redefining the department’s constituencies.

- All constituents must be involved in helping set our program objectives and in evaluating the level to which they are achieved.
- We must be able to get regular input from all constituencies, and we must document that input and document how it is incorporated into the assessment and/or program evaluation loops.

Level 5 Achievement for Constituents in the ABET Matrix for Implementation Assessment
- High degree of involvement in defining objectives and desired outcomes, and in the assessment and improvement cycles
- Sustained evidence of strategic partnership with all key constituents

Benchmarking (Constituencies for other departments and colleges)

Ohio University EECS
Faculty, Students, Advisory Board

University of Illinois, ECE department (EC2000 Accredited):
Students, faculty, alumni, industry, public, graduate programs
(http://www.ece.uiuc.edu/abet/statements.html)

University of Iowa, Mechanical And Industrial Engineering department
The constituencies of these programs include current students, alumni, and industries and other organizations that typically hire our students. As the University of Iowa is a public university, our constituencies in a broader sense are the citizens of the State of Iowa.
(http://www.me.engineering.uiowa.edu/academics/abetprogramsandconstituencies.asp)

University of Texas
Students, faculty, alumni, industry

Rowan University College of Engineering
Students, regional and national industries and agencies that hire our students, and those persons and groups that sponsor student projects through our Engineering Clinics
Summary of constituency review

The constituency list in the 1998 Assessment plan is too broad because it is very difficult to establish a procedure to get regular input from students’ families and Ohio citizens. Additionally, although we have an ME advisory board that represents three main constituencies (Employers of graduates, Program alumni and the Mechanical Engineering Profession) and we have a good history of working with the ME advisory board, not all constituencies were involved in the determination of the department’s objectives as defined in the 1998 Assessment Plan. Based on our benchmarking studies and the primary task of the constituencies (setting and evaluating department objectives), the list of constituencies must be updated the procedure for soliciting and incorporating input from all constituencies must be improved.

Proposed Constituencies, including the plan for regularly soliciting and incorporating their input. (Modification to March 2000 Assessment Plan).

Our program constituents include the following:
- Mechanical Engineering Department Faculty
- Students (including current students and alumni)
- Employers of Graduates (including industry and graduate schools)

The ME advisory board will be the primary means for organizing constituency reviews and input. We have a good history of working with the ME advisory board, and have a process set up for yearly departmental reviews as well as ME advisory board involvement with our Capstone Senior Design Project. The Mechanical Engineering advisory board currently includes 7 active members, all of whom work in industry and are alumni of the Ohio University ME department. As such, they represent two major constituency groups, alumni and industry employers. We need to add diversity to the ME advisory board and make sure all constituency groups are represented.

In order to make the ME advisory board truly representative of our constituents, the board should include active and/or adjunct members from all of the following groups:
- Alumni
- Full time employers of OU graduates (including at least one non-alumni employer) [Strive to represent the range of industries that hire a significant number of OU ME graduates]
- Co-op employers of OU students (including at least one non-alumni employer)
- Practicing Mechanical Engineers representative of the diversity of our students (including minorities and women)
- Current OU ME Students (The student committee will be led by the 2 ME seniors serving as engineering ambassadors for the college, and will include a minimum of 1 sophomore, 2 juniors, 1 OU alumni currently in graduate school, and the 2 senior leaders. It is preferred that the students selected for the review committee have co-op and/or industrial experience.)

The expanded ME advisory board, including the student committee, will encompass all key constituency groups except faculty and graduate schools, which are covered by our faculty. Since a large number of our graduate students come from our undergraduate program, our faculty members are well qualified to represent the graduate school constituency group. Therefore, all items requiring input from all constituencies will be reviewed by both our faculty and by the ME advisory board. The reviews and recommendations, as well as all actions taken as a result of the reviews will be documented.

The desired and actual makeup of the ME advisory board will be evaluated yearly (as part of the yearly advisory board program review) to ensure that all constituencies are adequately represented.
1. Evaluation of Program relative to Educational Objectives
Based on the ME industrial advisory board’s review of the evidence for evaluating the program’s achievement of its objectives, we provide the following responses representing our level of agreement with the program objective statements.

Circle the appropriate response (SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree).

| 1 | OU ME graduates have the necessary technical skills and teamwork skills to be successful as entry-level mechanical engineers in a range of specialty areas, including design of thermal/fluid systems or mechanical systems, manufacturing, materials, or other related areas; or (for those graduates with the ability and the desire) to gain entry to and successfully complete an advanced degree program in engineering, business, medicine, or any other related field | SA  A  D  SD |

... Justification for the responses:
Provide some discussion or justification for all responses, including identification of all evidence reviewed.

2. Department-level and curriculum-level assessment
Based on the advisory board’s review of the assessment evidence, including our detailed involvement in design reviews and our review of multiple design reports and presentations throughout the year-long Sr. Capstone design project, we provide the following responses representing our level of agreement with the high-level program outcome statements.

Circle the appropriate response (SA=Strongly Agree, A=Agree, D=Disagree, SD=Strongly Disagree).

| 1-1. (ABET-c) | OU ME graduates will demonstrate an ability to design a system, component, or process to meet desired needs | SA  A  D  SD |

... Justification for the responses:
Provide some discussion or justification for all responses, including identification of all evidence reviewed

Suggestions for improvement of the overall curriculum

3. Evaluation of Sr. Design Capstone design project and the entire student learning experience and suggestions for improvement
[Note: The focus here is on the course and the experience, not an assessment of the current students’ achievement of the outcomes]
EC2000 – The Spirit and the Letter
“The unexamined program is not worth certifying”

Note: this document presents our department’s interpretation of the new ABET Engineering Criteria and is meant as a guide so that we do not lose sight of the ultimate goal of the criteria, which is continuous improvement of our program to achieve improved student learning / improved student preparation in line with constituency needs.

The ABET Engineering Criteria can be summarized as follows:

1. Know Yourself
   - Clearly define the mission of your program and your constituencies
     - This defines who you are and who your customer is.

2. Know your Customer(s) and their needs
   - Solicit and incorporate input from your constituencies, especially with respect to program educational objectives
     - You must know student goals and industry/employer/graduate school needs in order to properly set your objectives

3. Develop an educational Program consistent with your mission and your customer needs
   - Make sure that your program educational objectives are consistent with both your mission (who you are) and the constituency input (what your customer wants/needs)
   - Clearly define student learning outcomes to ensure that your program educational objectives will be met. Note that the outcomes provide a blueprint for how the program objectives (and mission) will be met.
   - Develop and deliver a curriculum that prepares all students to satisfy the learning outcomes

4. Monitor/assess your program’s performance in meeting your customers’ needs
   - You can’t know if your product is meeting the specifications (outcomes and objectives based on customer needs) unless you measure your outcomes, so institute an assessment and review process that involves a regular evaluation of the achievement of objectives and a regular assessment of the student learning outcomes.

5. Continuously improve your program to better meet your customers’ needs
   - Model your assessment/review/continuous improvement process after the best business/industry quality initiatives such as ISO9000, 6-sigma, etc.
   - Strive to continuously improve your program and your product in order to stay in business (You can always improve, and if you don’t then your customer will take their business elsewhere)
     - Improve both program and process based on the assessment data
Additional notes on our understanding/interpretation of the Engineering Criteria:

1. We believe it is necessary to understand both the spirit and the letter of the ABET Engineering Criteria and to personalize the criteria (to apply to a specific program) before applying them so that the resulting “assessment and continuous improvement process” is in line with the department’s mission, statement of purpose, and objectives and maintains the program’s overall vision throughout. Our program’s understanding and personalization of the criteria is reflected in our summary: EC2000–The Spirit and the Letter.

2. We understand that 100% faculty involvement/engagement in assessment activities is absolutely necessary in order for the assessment and CI plan to be successful and for our program to get accredited, and we have organized our plan and our faculty performance review processes accordingly (for example our department’s merit raises depend on participation in assessment and continuous improvement activities).

3. We believe that keeping the process as simple as possible from a procedural standpoint (KISS) will allow us to focus on doing the few essential things very well, because being too ambitious or trying to do too much at once will almost certainly lead to dilution of effort and subsequent problems. Our assessment plan therefore avoids complex matrix mappings and redundant assessments and focuses on high-quality direct assessment of student work at the points in the curriculum where the student is supposed to have achieved each specific outcome at the highest mastery level – identified as tollgates for each specific outcome.

4. We understand that for assessment to be successful what happens before the class is taught (planning assessment as an integral part of the course) is at least as important as what happens during/after the course (the actual assessment activity). In other words, planning and course design with outcomes and assessment in mind is a key to success.

5. Although we require the faculty to follow a standard template for outcomes-based course design, we respect and protect each faculty member’s academic freedom, including their freedom to apply whatever instructional methods that they feel are most appropriate given the topic, the students, and their teaching style. To assist faculty in the paradigm shift to outcomes-based instruction, we provide resources from recent and respected pedagogical research (for example Understanding By Design) to help faculty translate outcomes into learning activities and assessment activities. The faculty members are free to set their own activities, subject only to the constraint that they be reviewed and continuously improved to better achieve the desired outcomes and program objectives.

6. We understand the importance of documenting all significant activities related to our overall assessment and continuous improvement process, and documenting them right when they are happening rather than planning to do it after the fact. In the long run the “as it happens” documentation saves a lot of time compared to trying to pull together materials and evidence of assessment at the end of a course or right before an ABET accreditation review.

7. We believe that the real focus of the ABET Engineering Criteria is not assessment but program improvement, and all of our plans and procedures are set up and will be carried out with a vision of continuously improving our program and our processes to better satisfy our constituencies.

The ME faculty agrees with the summary and personalization of the ABET Engineering Criteria detailed above and will review and update this document as changes are needed or every 3 years as part of the formal review of all aspects of the program’s overall assessment and continuous improvement process.

Signature of faculty representative signifying ME faculty approval

Date
Ohio University, RCENT, ME Department, ABET Engineering Criteria Accreditation Plan
Summer 2002 Review of Assessment Plan

Know Yourself
- Develop/Update the Mission Statement & Statement of Purpose for your program

Know your customer(s) and their needs
- Work with advisory board to develop/update/publish program educational objectives to support your mission

- Identify constituencies, create an advisory board with membership that adequately represents the key constituencies, and set up a plan for regularly soliciting and incorporating their input.

Develop a program consistent with your mission and your customer needs
- ME Objective 1
- ME Objective 3
- ME Objective 2
- ME Objective 4

High-level Program Outcomes to support obj. 1
High-level Program Outcomes to support obj. 2
High-level Program Outcomes to support obj. 3
High-level Program Outcomes to support obj. 4

Specific/Measurable Outcomes for each HL Outcome

Design a curriculum to support the specific outcomes, define tollgate courses for each specific outcome, establish assessment evidence for each specific outcome, and use a backward design process in tollgate courses to plan learning activities and mastery learning procedures to ensure student achievement of all specific outcomes at the required mastery level.

Deliver the educational program based on the outcomes-based curriculum design

The instructor for each tollgate course will enforce a mastery learning procedure to verify that all students who pass the tollgate course meet the specific outcomes for that course at the required mastery level.

The instructor for each tollgate course will follow a formal outcomes-based assessment plan that includes direct assessment of student work on pre-defined assessment activities, plus the use of student surveys and instructor reflection reports to generate data for continuous improvement of the program and the process.

Faculty “area of expertise” committees will review the data for their respective specific outcomes each quarter and will prepare a yearly summary report that includes their evaluation of student achievement of the outcomes and recommended action items for CI of the curriculum and/or the assessment process.

The ME advisory board will perform a yearly program review with a focus on evaluating the program relative to achievement of the program objectives and suggesting actions for continuous improvement based on their role as constituency representatives. Findings will be documented in a program review report.

Monitor/Assess your program’s performance in meeting your customers’ needs
Our overall assessment & CI Process is an expanded and personalized version of the ABET 2-loop systematic approach to meeting the spirit and letter of the Engineering Criteria. It consists of a basic \textbf{constituency/objectives} (review) loop which includes a focus on big picture items like the program objectives, and a \textbf{faculty/outcomes} (PLAN/DO/CHECK/ACT) loop which deals with the details of defining specific/measurable outcomes directly linked to objectives, delivering a curriculum designed to help students achieve those outcomes, and directly assessing the achievement of those outcomes. The process is presented in a multi-tier format, proceeding from the “general” department mission statement and program-level objectives (developed with constituency input and review) to the “specific” student learning outcomes (which can be dealt with on the course level) that prepare students to achieve the high-level outcomes and fulfill the program objectives. Note that the process is reviewed yearly by faculty as part of the normal assessment process, but is formally reviewed and recertified with full constituency input every three years.