

Findings and Changes Based on Program Assessment

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Assessment Tools Defined

- Mission and vision statements
- Program constituencies
- Program objectives
- Program outcomes (based on ABET a-k)
- Course learning outcomes
- Key courses for direct assessment

Assessment Tools Established

- Industrial advisory board
- Mapping of course outcomes to program outcomes
- Linking ABET outcomes to PULs
- Student satisfaction survey
- Course outcome surveys in all courses (indirect assessment)
- Exit survey for program outcomes
- Employer and alumni surveys
- Documentation on the web

Deficiencies Found

“Based on surveys of two semesters”

- \approx 23% of outcomes out of 220 were not met adequately (based on a threshold score of 3.75 out of 5.0)
- Advising perceived to be inadequate
- Experimental labs perceived to be inadequate
- Found weak on:
 - Thermal design
 - Multidisciplinary applications
 - Statistics, probability and data analysis

Deficiencies Found (Cont'd)

“Based on surveys of two semesters”

- Also weak on soft ABET outcomes h and j:
 - h) Understand the impact of engineering solutions in a global and societal context
 - j) Demonstrate the knowledge of contemporary issues

Changes Implemented

“Based on Student Satisfaction Surveys”

- Lab equipment upgraded
- A new advising system established
- Standard lab report format and rubrics developed
- Standard design report format and rubrics developed

Changes Implemented (Cont'd)

“Based on Outcomes Surveys”

- Introduced modern computer software in design courses
- In capstone design course:
 - Students are required to comment on environmental, safety, and societal impact of the design in their reports
 - Added a seminar component with speakers from industry to advocate professionalism
 - Awards for best design and best poster are established
 - A jury evaluation process is adopted

Changes to be Implemented

“Based on Outcomes Surveys”

- A new thermal design course
 - to complement the capstone design for multidisciplinary applications
- A new statistics and data analysis course
- Restrict part of general education electives in the program (18 credits)
 - To address the weakness in soft ABET outcomes (h and j):

Future Steps

“Based on Assessment”

- Assess the selected key courses more directly
- Form a student advisory board
 - For more feedback
- Establish some objective testing methods – *(under consideration)*:
 - Prerequisite tests
 - Competency exams
 - Exit exams
 - Mandatory FE Exams

Future Steps (Cont'd)

“Based on assessment”

- Establish an interactive web-based assessment management software for:
 - Interactive surveys
 - Documenting and retrieving data
 - Interactive entering of pertinent data
 - Analysis of data

Requires institutional support or a professional system



What Did We Gain?

- A systematic approach for evaluating and detecting the strengths and weaknesses of the program
- Systematic feedback approach to make changes
- More attention given to specific outcomes in the courses
- Continuity among the changing instructors of the same course