

DEPARTMENT OF INTEGRATED ENGINEERING & TECHNOLOGY
Integrated Engineering Program

Note: The following objectives, educational outcomes and assessment criteria are stated in a format consistent with ABET's guidelines for accreditation.

Expanded Statement of Institutional Purpose

Mission Statement:

The mission of the Integrated Engineering program is to support and realize with excellence the overall mission and vision of the University and to provide a broadly based, cross-disciplinary engineering education founded upon a design-oriented curriculum which integrates several disciplines into a whole, enabling graduates to undertake the wide variety of design and manufacturing challenges that modern industry faces.

Objectives:

The objectives for the Integrated Engineering program are:

- A. a solid understanding of the fundamentals of mathematics, physical science, and engineering science, which re-occur in diverse technical applications and form the foundation for work in all fields of engineering;
- B. the ability to practice engineering design and analysis and to integrate several engineering concepts into a system or process;

Program Intended Educational Outcomes

The standards and competencies that the student will have met and achieved at the time of graduation are expressed in terms of the characteristics of the program's graduates, which are the educational outcomes required for accreditation by the Accreditation Board for Engineering and Technology (ABET). Each graduate will have:

- a. an ability to apply knowledge of mathematics, science, and engineering;
- b. an ability to design a system, component, or process to meet desired needs;
- c. an ability to function on multidisciplinary teams;
- d. an ability to identify, formulate, and solve engineering problems;
- e. an understanding of professional and ethical responsibility;
- f. an ability to communicate effectively;
- g. the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- h. a recognition of the need for, and an ability to engage in life-long learning;

Means of Program Assessment and Criteria for Success

The Integrated Engineering program has recently been reviewed by a team from ABET. The visit was positive and the team made a few recommendations. These include reconsideration of course prerequisites, re-designing the curriculum to ensure that the courses support the design projects, and developing assessment tools for the Program Educational Objectives. As stated in the program self-study, the Program Educational Objectives and the Program Outcomes and their achievements will be assessed using the following tools:

- Course Survey: every offering of the course;
- Course Assessment: performed by the faculty every offering of the course;
- Review of Design Projects: performed by the instructor and other faculty and representatives from the industry every offering of the course;

Summary of Data Collected.

- Course Survey: each course was surveyed in Fall 2004 and Spring 2005. The data were used in the Fall, 04 course assessments.
- Course Assessment: each faculty member did a self assessment of Fall 2004 courses. These were also reviewed by a colleague and presented for open discussion at a faculty meeting. In each course, we were meeting or exceeding our course objectives. In our Materials Science Lab course the above process resulted in a recommendation that we move the course towards a testing and evaluation of practical engineering materials, such as concrete, and engineered materials such as glulams, TLJ's, composite materials. We also recommended that more equipment be purchased for this lab.
- Review of Design Projects: As part of the requirements of ENGR 4085, two students performed a design of an annex to the Technology

Use of results

We will make a recommendation to the Advisory Board to allow a change in the course description for the Material Science Lab course.

Following the ABET visit, a report was prepared which addresses the three shortcomings identified by the visiting team. The report discusses changes made to the curriculum and to the program. These changes include:

- a revised course prerequisite structure
- a new system for review of the assessment method of the Program Educational Objectives
- a better description of how the program Educational Objectives are assessed.
- a revised student advising system.

Expanded Statement of Institutional Purpose
(Cont'd)

- C. the ability to pursue professional careers in multidisciplinary fields by the development of effective teaming abilities and communication skills;
- D. the ability to pursue advanced studies and/or assume leadership roles along diverse career paths;
- E. a strong appreciation for and commitment to ethical responsibilities, professionalism, lifelong learning, and a concern for society and the environment.

Program Intended Educational Outcomes
(Cont'd)

- i. a knowledge of contemporary issues;
- j. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Means of Program Assessment and Criteria for Success:
(Cont'd)

- Student Exit Survey: conducted at graduation;
- Fundamentals of Engineering (FE) exam: results will be reviewed at the end of the academic year;
- Alumni Survey: conducted every two years;
- Employers Survey: conducted every two years.

A two-loop process (discussed in detail in the program self-study) will be used to assess the Program Educational Objectives and the Program Outcomes. Assessment of the Program Outcomes will be performed on a two-year cycle, whereas the assessment of the Program Educational Objectives will be performed on a four-year cycle, benefiting from two full iterations on the Program Outcomes. The Assessment is greatly facilitated by various mappings that have been developed as part of the preparation of the program for accreditation. These mappings are discussed in great detail in the program self-study.

Summary of Data Collected.

building to house our load frame. Dr. Pratt rated their design as very well done. As part of the requirements for ENGR 3095, an engineering model was created in an attempt to solve a problem faced by Deseret Labs. Preliminary results seem very promising. Deseret Labs was very pleased and rated the student designs as above average to exceptional. In addition, students enrolled in ENGR 4025 with Dr. Azouz successfully designed a computer-controlled force balance positioning system for the wind tunnel. Precision Steel was very pleased with the test results performed by our design students.

- Student Exit Survey: results forthcoming.
- FE exam results: Dave Riddle took and passed the FE exam. Korin McDonald and Ryan Thomas took the exam this spring. The results will be available next July.

In addition, comments and suggestions were received from the ABET team during the Fall, 2004 accreditation visit.

Use of results