

DIVISION OF ENGINEERING & PHYSICS
Integrated Engineering Program
2002-2003

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 the overall mission of the University, provide a design-oriented, cross-disciplinary engineering education founded upon sound engineering fundamentals, principles, and ethics, prepare graduates for professional careers in industry, consulting, and governmental agencies, where cross-disciplinary professional service is commonly required, and serve as an engineering resource for the region.

Objectives:

The objectives for the Integrated Engineering program are:

- A. To provide students with a sound foundation in mathematics and engineering suitable for a career in a multidisciplinary environment;
- B. To provide students with education and problem-solving skills in engineering;

- C. To prepare students for professional careers in interdisciplinary fields by the

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

Student learning as it relates to the educational outcomes will be assessed using both formative and summative measures. Formative assessment measures include exams, quizzes, homework assignment, individual and team laboratory and project reports, and oral presentation. Summative assessment measures include capstone design projects, Fundamentals of Engineering (FE) exam, acceptance in graduate programs, focus groups, exit interviews, alumni and employers surveys. In addition, The FE program will be reviewed for accreditation by ABET.

- Students will achieve a grade of C or better in their major and a passing grade in general education.
- FE exam success rate for the Integrated Engineering program graduates will be at or above the average for the state of Utah.

- Students wishing to pursue graduate studies in a specialized discipline will be able to do so, after completing deficiency course(s) in the discipline.

Summary of Data Collected

The four-year Integrated Engineering program has been offered for two years. The program will produce the first graduated class in May 2004.

- Grades earned by majors in Engineering have been reviewed. The majority of students passed their major courses and general education courses with a grade of "C" or better.
- Three students took the FE exam in the Fall of 2002. Two of them passed and the third one failed by one point. These students took the exam one semester ahead of time. Two students (including the one who failed) took the exam in Spring 2003. One student reported having passed the exam. No information is available yet about the second student, but it is highly likely that he also passed the exam.

- Discussions have been initiated with the Utah Board of Examiners concerning the possibility of releasing results obtained by students on the FE exam, broken down by subject area

Use of Results

The data collected are used to identify problem areas and devise ways of remedying shortcomings.

- Students who have earned grades less than a "C" have been contacted and reasons for their lack of performance were determined. Most students cited lack of time to study and under-preparedness as the two main reasons for performing poorly. In the future, faculty will make sure that students are taking courses in the proper sequence. They will also advise students on any remedial courses that must be taken before enrolling in major courses. Students will also be warned that they may not be able to carry a full course load if they have a part-time or full-time job. All students in difficulty will

be encouraged to take a time management course.

- It is confirmed that three out of the four students who have taken the FE exam passed it. It is also highly likely that the fourth student also passed the exam. In this case, the success rate in the FE exam would 100%, and no action is necessary at this point.

Expanded Statement of Institutional Purpose
(Cont'd)

development of teaming abilities and communication skills;

- D. To provide opportunities for the development and cultivation of lifelong learning skills, professionalism, ethics and the nourishment of creative talents.

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)

- Students will graduate and leave the program with a portfolio of design projects they can show employers.
- The Integrated Engineering program will receive ABET's accreditation in Spring 2005.

Summary of Data Collected
(Cont'd)

- Engineering students who applied to other schools to pursue studies in specialized disciplines have been accepted. Many of these students were offered scholarships.
- A self-study of the Integrated Engineering program is currently being prepared as part of ABET's accreditation visit requirements. The self study will be completed at the end of Spring 2004. ABET's accreditation visit will occur in Spring 2005.

Use of Results
(Cont'd)

- the Spring 2003 exam are known.
- The FE exam results broken down by subject area will be used to identify those subjects which pose problems to the students and investigate the causes. In the future, FE exam review sessions may be held at the beginning of each semester .
- Since all students who have applied to other schools to pursue studies in a specialized discipline have been accepted, no action is necessary at this point. However, meetings are held at the end of each year with the other institutions of higher education to discuss course articulation issues.
- Results of ABET's accreditation visit and

associated self-study will be used to enhance the program and its delivery.