

**Southern Utah University  
Department of Integrated Engineering and Technology  
Academic Outcomes Assessment Report  
2005-2006**

**Expanded Statement of Institutional Purpose:**

**Technology Mission statement:**

The Applied Technology programs support the mission of the university by providing a high quality undergraduate education to students with in-depth skill development in the program discipline areas of criminal justice, construction technology/construction management, electronics engineering technology, CAD/CAM engineering technology, CAD/GIS engineering technology, automotive technology and cabinetmaking and millwork, through professional, credentialed faculty using state of the art facilities and equipment. In addition, the programs provided include Technology Education teacher certification with a secondary endorsement. Furthermore, we aim to provide meaningful service to industry, government, and all communities served by the university.

**Goal Statements:**

**I.** The Applied Technology programs at SUU will prepare students with the technical knowledge and

**Program Intended Educational Outcomes:**

**Technology:**

**I.** Students will demonstrate their knowledge and mastery of their degree program (i.e., electronic technology, cabinetmaking and millwork, etc.)

**II.** Business/industry representatives will have an opportunity to provide curricular input.

**III.** Students will be satisfied with learning opportunities afforded to them by the Applied Technology department.

**Means of Program Assessment and Criteria for Success:**

**Technology:**

**I.** 95% of Applied Technology majors will pass their Applied Technology courses with a minimum grade of "C-" (a minimum grade of "C" is required in Technology Education courses), as evaluated by assessment measures within each course. Applied Technology courses will contain activities that will enable students to demonstrate a reasonable level of proficiency in their learned skills.

**II.** Each Applied Technology program area will form an advisory committee that will meet bi-annually to review curriculum and provide guidance and direction for the program. (The Utah State Technology Education Planning Council will serve as the Technology Education program "industry advisory committee".)

**III. (A)** 80% of graduating students will agree with the statement, "The quality, availability, and diversity of course offerings, and lab experiences in my degree program were appropriate."  
**OR**

**Summary of Data Collected:**

**Technology:**

**I.** The overall percentage of Technology majors that completed their Applied Technology courses with a C- or better for the 04-05 academic year was 91.14%.

**II.** All technology programs organized impressive advisory committees, who met as directed and provided critical feedback to all of the programs and faculty. The minutes are on file in the division chairs office.

**III. (A)** There are in fact 5 questions on our surveys that deal with "quality of courses", "availability of courses" (time of day), "availability of courses" (not full), "diversity of course offerings", and "appropriate

**Use of Results:**

**Technology:**

**I.** The overall percentage of successful course completion is just slightly below our goal of 95%. We will continue to evaluate all courses and program curriculums to see where we might change to improve the likelihood of student success.

**II.** We will continue to emphasize the importance of program advisory committee input to the overall success of our programs.

**III. (A)** While this score is higher than last year, it is still below our goal, and indicates that several of our students remain dissatisfied with the quality of offerings, the availability of course offerings (particularly the "time of day"),

**Expanded Statement of Institutional Purpose: (cont.)**

**Technology:**

skills necessary to succeed in their respective disciplines.

II. The Applied Technology programs will provide service to related industries/ organizations at the local, regional, state, and national levels, and work in close cooperation with industry to train students to meet employers' needs as well as provide training for their employees.

III. The curriculum in the Applied Technology programs will consist of a blending of classroom courses in theory, methodologies and histories of the program disciplines as well as lab/field experiences incorporating hands-on application of these principles.

IV. The intent of the Applied Technology faculty and curriculum is to produce well-rounded graduates who are conversant with the content in their program discipline and who can proficiently apply that content in the employment and/or continuing education endeavors.

V. The Applied Technology programs will achieve a high level (80%) of placement in employment and/or continuing education.

**Program Intended Educational Outcomes: (cont.)**

**Technology:**

**Means of Program Assessment and Criteria for Success: (cont.)**

**Technology:**

80% of Applied Technology majors enrolled in TECH 3000 will agree with the statement, "The quality, availability, and diversity of course offerings, and lab experiences in my degree program are appropriate."

**OR**

80% of Automotive majors enrolled in AUTO 1510 or AUTO 2560 will agree with the statement, "The quality, availability, and diversity of course offerings, and lab experiences in my degree program are appropriate."

III. (B) 80% of graduating students will give a rating of "Above Average" or "Excellent" to an overall rating of their degree program.

**OR**

80% of Applied Technology majors enrolled in TECH 3000 will give a rating of "Above Average" or "Excellent" to an overall rating of their degree program.

**OR**

80% of Automotive majors enrolled in AUTO 1510 or AUTO 2560 will give a rating of "Above Average" or

**Summary of Data Collected: (cont.)**

**Technology:**

lab experiences". The overall average percentage of students that agreed or strongly agreed with the "quality, availability, and diversity" statement was 71.83%.

III. (B) The overall average percentage of students that rated their degree program "above average or excellent" was 79.52%.

**Use of Results: (cont.)**

**Technology:**

and the diversity of course offerings. We will evaluate our courses for quality and take appropriate measures, but a more diverse program would require additional resources that are not available, and may have a negative impact on class size issues. Additional measures were taken this year to avoid course scheduling conflicts within the department, and to follow "time of day" scheduling policies. If students are dissatisfied with the time of day that courses are offered, it is an issue that is beyond departmental control. We will continue to educate the student population about the policies that govern course time scheduling.

III.(B) This score is much improved from last year, and is closer to our target, but there is still room for improvement. We will continue to evaluate programs with the goal of "overall program improvements".

**Expanded Statement of Institutional Purpose: (cont.)**

**Technology:**

**Program Intended Educational Outcomes: (cont.)**

**Technology:**

IV. Students will be prepared for post-graduation plans in their respective fields.

V. Students will find employment in their field and/or continue their educational pursuits.

**Means of Program Assessment and Criteria for Success: (cont.)**

**Technology:**

“Excellent” to an overall rating of their degree program.

IV. 80% of graduating students will agree with the statement, “I feel that my program has prepared me well for my future employment or educational plans.”

V. 80% of graduates will accept employment within their field of study and/or be accepted for continuing education programs within one year following graduation.

**Summary of Data Collected: (cont.)**

**Technology:**

IV. The overall average percentage of students that agreed or strongly agreed with the “program preparation” statement was 85.47%.

V. 100% of the technology program graduates have either continued on in graduate level studies, or accepted employment in their field of study, or a closely related field of study.

**Use of Results: (cont.)**

**Technology:**

IV. A high percentage of the students responded that they have been “well prepared for future education or employment plans”, and we surpassed our goal percentage. We will continue to evaluate our programs and make necessary improvements.

V. We will continue to track graduate placement and success, and emphasize the need for proper preparation for graduate level endeavors or employment in all programs.

## Expanded Statement of Institutional Purpose: (cont.)

### Integrated Engineering 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 with 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;
- C. the ability to pursue professional careers in multidisciplinary fields by

## Program Intended Educational Outcomes: (cont.)

### Integrated Engineering:

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
- 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.)

### Integrated Engineering:

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 pre-requisites, 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 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;
- Fundamentals of Engineering (FE) exam: results will be reviewed at the end of the academic year;
- Alumni Survey: conducted every two years; Last survey conducted Nov 2004.

## Summary of Data Collected: (cont.)

### Integrated Engineering:

- Course Assessment: each faculty member did a self assessment of courses. In each course, we met or exceeding our course objectives.
- Review of Design Projects: As part of the requirements of ENGR 4085, six graduating student's projects were evaluated by faculty and members of the professional community. Design projects included a design of a sewage lagoon for the US Forest Service, Analysis of the Lake Powell Pipeline, Preliminary Analysis of a DL Granulator, Design and construction of a Automated Folder Packaging Machine for Smead, and design of an HVAC System for a Building Retrofit.
- Fundamentals of Engineering (FE) results: Three of six students passed the FE exam on the first take. Results for the three re-exams are pending.
- Alumni survey: No formal survey was conducted this year, however, all graduates continue to be employed upon graduation and/or are pursuing advanced degrees.

## Use of results

### Integrated Engineering:

- Our assessment of the courses has concluded that for now, no major changes are required to the program. Graduates we have interviewed informally, have indicated that the Program has the right approach and that the "general nature" of the Integrated Program has not limited their usefulness or adversely impacted their ability to solve engineering problems. In fact, the broad nature of the instruction has given them flexibility to solve a number of problems that other more specialized engineers have difficulty with. It should be noted that the Utah Department of Transportation is now actively recruiting our graduates and now specifies "Civil" and "Integrated Engineers" for their open positions. Our graduates continue to be paid above the level of the average for all engineers in the state, and we currently have one graduate pursuing an advanced degree at the U of U.

**Expanded Statement of Institutional Purpose: (cont.)**

**Integrated Engineering:**

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.

**Special Note: The objectives, educational outcomes, and assessment criteria for the Integrated Engineering Program are stated in a format consistent with ABET's guidelines for accreditation.**

**Program Intended Educational Outcomes: (cont.)**

**Integrated Engineering:**

**Means of Program Assessment and Criteria for Success: (cont.)**

**Integrated Engineering:**

- Employers Survey: conducted every two years. This survey will be conducted in September 2006
- 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: (cont.)**

**Integrated Engineering:**

**Use of Results: (cont.)**

**Integrated Engineering:**