Computer Engineering Technology
2015-16 Assessment Report

I. Introduction

In 1965, OIT was invited to join a Technical Education consortium sponsored by a number of major computer manufacturers. In response, OIT developed an Electro-Mechanical Engineering Technology program. This program was based on a mix of existing EET, MET, Math and other support courses. The name of the program was changed to Computer Systems Engineering Technology in 1973 in order to better represent the course material and capabilities of graduates. Course offerings were expanded, refined and renumbered using CST prefixes to reflect their computer systems content. Since that time, the program has continued to evolve in order to track new developments in the field and keep graduates current. As of this time, the program is only offered on the Klamath Falls campus. Enrollment in the department continued to be flat or up slightly relative to previous years, but, the number of students selecting to pursue a degree in CET was up a little from the previous year. Three students graduated with BS degrees and 6 students were awarded AE degrees in the June 2015 commencement. The results of the 2014 graduate success survey showed a starting salary range of $63,500-66,500. During the academic year, one faculty member, Phong Nguyen, moved to take a position with OIT as CSET programs coordinator and as a professor in the Embedded Systems program on the Wilsonville campus. A new faculty member, Michael Healy was hired to replace him.

II. Summary of program mission, educational objectives and student learning outcomes

The program educational objectives and student learning outcomes are reviewed annually (each fall) by the program faculty and by our IAB. Also, t

IV. expose our students to cross-disciplinary educational programs, and provide high tech industry employers with graduates in the computer engineering technology profession, a profession which is increasingly being driven by advances in technology.

CET Program Educational Objectives

Program Educational Objectives are broad statements that describe what graduates are expected to attain within a few years of graduation.

Alumni of the Computer Engineering Technology (CET) Bachelor Degree program may be employed in a wide range of high tech industries from industrial manufacturing to consumer electronics where they will be involved in solving problems through the development of hardware, software and embedded applications. Alumni may be involved in product design, testing and qualification, application engineering, customer support, sales, or public relations.

A) Alumni will demonstrate technical competency through success in computer engineering technology positions and/or pursuit of engineering or engineering technology graduate studies if desired.

B) Alumni will demonstrate competencies in communication and teamwork skills by assuming increasing levels of responsibility and/or leadership or managerial roles.

C) Alumni will develop professionally, pursue continued learning and practice responsibly and ethically.

Alumni of the Computer Engineering Technology (CET) Associate Degree program may be employed as technicians or in support roles in a wide range of high tech industries from industrial manufacturing to consumer electronics. Alumni may be involved in

CET Bachelor of Science Program Student Learning Outcomes

Graduates of the CET Bachelor's degree program are expected to be able to demonstrate:

1. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

2. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

3. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

4. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;

5. an ability to function effectively as a member or leader on a technical team;

6. an ability to identify, analyze, and solve broadly-defined engineering technology problems;

7. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

8. an understanding of the need for and an ability to engage in self-directed continuing professional development;

9. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

10. a knowledge of the impact of engineering technology solutions in a societal and global context; and

11. a commitment to quality, timeliness, and continuous improvement.

CET Associate Degree Student Learning Outcomes

Graduates of the CET Associate degree program are expected to be able to demonstrate:

1. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

2. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

3. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

4. an ability to function effectively as a member of a technical team;

5. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

6. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;

7. an understanding of the need for and an ability to engage in self-directed continuing professional development;

8. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and

9. a commitment to quality, timeliness, and continuous improvement.

III. Assessment Cycle

CET BS Program Assessment Plan

Learning Outcome:	15-16	16-17	17-18
1. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities	•		
2. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies			•
3.			

CET AE Program Assessment Plan

Learning Outcome:	15-16	16-17	17-18
1. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities	•		
2. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge			•
3. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;			•
4. an ability to function effectively as a member of a technical team;	•		
5. an ability to identify, analyze, and solve narrowly defined engineering technology problems;			•
6. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;		•	
7. an understanding of the need for and an ability to engage in self-directed continuing professional development		•	
8. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity		•	
9. a commitment to quality, timeliness, and continuous improvement	•		

IV. Summary of 2014-15 Assessment Results

During the 2015-16 academic year, the program faculty assessed three student learning outcomes as summarized below.

Student Learning Outcome #1 (BS degree):

Assessment Method: Assessments were based on a lab assignment given in CST 337 Fall 2015. Students were asked to implement a state-machine based interrupt service routine to manage reading and writing a block of data to/from an EEprom witih an SPI interface. This is a significantly difficult problem since commands written in instance k of the ISR will result in data returned in instance k+2. Students were also required to collect SPI setup and hold timing data for both the processor and the EEprom using a MSO.

Performance Criteria	Measurement Scale	Minimum Acceptable Performance	Results
Designed, debugged and demonstrated the interrupt driven EEprom system.	Successfully completed the assignment with minimal assistance	90%	100% k 0.001i..(rn2cal) .346[(.. re [g

Designed, debugged and demonstrated pulse width modulation by slowly dimming and increasing the brightness of each LED sequentially.	Successfully completed the assignment with minimal assistance	75%	90% (18/20)
Correctly wired LED to the FPGA. Correctly calculated and selected appropriate size resistor.	Successfully completed the assignment with minimal assistance	75%	90% (18/20)

Evaluation: (3/10/16) Assignments had to be turned in on time to be considered in the assessment. All 20 students turned in their work. 18 of 20 students were able to independently

		Performance	
Design	Pass/Fail	90% Pass	100% (6/6)
Requirements documentation or matrices were developed in accordance with SMART et. al. outlines.	Pass/Fail	90% Pass	100% (6/6)
Final documentation met content, organization, and writing quality standards set forth in the final report rubric	Pass/Fail	90% Pass	100% (6/6)
A test plan was developed for software and hardware functionality in the system.	Pass/Fail	90% Pass	100% (6/6)
The final submitted device functioned correctly during demonstration	Pass/Fail	90% Pass	100% (6/6)

Evaluation: (10/12/16) All senior project students carried out their project successfully. Each student was able to fulfill the performance criteria.

Actions: (10/12/2016) No changes need to be made as a result of this assessment.

Indirect Assessment #1
Data Collection Date: Spring 2016
Coordinator: Doug Lynn

8 of 8 CET seniors responding on the 2013-14, 2014-15 and 2015-16 senior exit survey questions related to this outcome judged that they were adequately prepared with an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives.

Actions (10/12/16): No changes need to be made as a result of this assessment.

Student Learning Outcome #5 (BS degree): an ability to function effectively as a member or leader on a technical team.

Student Learning Outcome #4 (AE degree): an ability to function effectively as a member of a technical team.

Direct Assessment #1

Data collection Date: 5/5/16

Coordinator: Phong Nguyen

Assessment Method: Assessments were based on 8 students divided evenly into two separate project team in the Junior Project sequence. It is a three quarter, 30 week class which students

Data collection Date: 6/11/16
Coordinator: Phong Nguyen

Assessment Method:

performance criteria except one. In this one case, direct assessment #2 for outcome #9, students did not demonstrate their ability to implement quality improvements in their junior projects. In order to address this, the professor responsible for Junior project sequence will add further emphasis on quality throughout the entire JP sequence.

VI. Changes Resulting from Assessment

Compared with the previous 2012-13 assessment cycle, students in both Junior and Senior projects demonstrated an improved ability to complete their projects, however, in the case of the junior project this still did not leave enough time to demonstrate improvements in quality. Last time this was assessed, not all projects were completed, so some improvement has been achieved, though perhaps not enough. Increased emphasis on managing the scope of projects and on completion has helped. However, it appears that a bit more emphasis is still needed.