Electrical Engineering
2011–2012 Assessment Report

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Contents

1 Introduction

1.1 Program Goals and Design

Electrical Engineering at OIT aims to impart a thorough grounding in the theory, concepts, and practices of electrical and electronics engineering. Emphasis is on practical applications of engineering knowledge. The hands-on student projects undertaken by all program graduates include real-world applications like electric, hybrid, and fuel-cell cars, a three-term multidisciplinary senior project (design, implementation, and test, not simply simulation) and NASA's High-Altitude Balloon and Rocket Projects. The goal of this practical program design is to graduate engineers who require a minimal amount of on-the-job training while providing sufficient theoretical background to enable graduates to attend and succeed in graduate education in engineering.

1.2 Program History, Enrollment & Graduates

In 2007, the Oregon Institute of Technology (OIT) began offering its new Bachelors of Science in Electrical Engineering program (BSEE) at its main campus in Klamath Falls, Oregon. The BSEE degree is a traditional EE degree that is offered to replace the BSEET program in KF, and it was created to prepare graduates for careers in various fields associated with electrical engineering. These include, but are not limited to, analog ICs and systems, digital and microcontroller systems,

10, 2011	US Air Guard	Comm. Eng.	Military
11, 2011	PCM Sierra	Design Eng.	Networking & Telecommunications
12, 2011	Black & Veatch	Power Eng.	Construction
13, 2011	SEL		

campus, giving them improved access to internships in the Silicon Forest, as the semiconductor industry in the Portland metro area is known.

This arrangement satisfies the needs of the state of Oregon by placing a traditional EE program in the southern end of the state to serve that region as well as providing a small-school EE program to students who desire a small student-to-faculty ratio and small class sizes. The EE program also supports the shift at the institution form four-year technology degrees to four-year engineering degrees. The addition of EE completes the ETM College (Engineering, Technology & Management) with CE, EE, ME and REE Programs in Klamath Falls.

2 Program Mission, Educational Objectives and Outcomes

2.1 Program Mission

The mission of the BSEE Program is to provide a comprehensive program of instruction that will enable graduates to obtain the knowledge and skills necessary for immediate employment and continued advancement in the field of Electrical Engineering. The program will provide high-quality career-ready candidates for industry as well as teaching and research careers. Faculty and students will engage in applied research in emerging technologies and provide professional services to their communities.

2.2 Program Educational Objectives

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. The Program Educational Objectives of OIT's Bachelor of Science in Eh

- The graduates of the BSEE program will be working as effective team

(l) a knowledge of differential and integral calculus and advanced mathematics including differential equations, linear algebra, vector calculus, complex variables, Laplace transforms, Fourier transforms, and probability and statistics with appropriate applications.

(m) a knowledge of basic sciences, computer science, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components, as appropriate to program objectives.

3 Cycle of Assessment for Program Outcomes

3.1 Introduction and Methodology

Table 3 shows the *minimum* set of outcomes asse

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3.3.3 Methodology for Assessment of Program Outcomes

3.3.4 2011–12 Targeted Assessment Activities

The sections below describe the 2011–12 targeted assessment activities, and give a summary of student performance for each of the assessed outcomes. Unless otherwise noted, the tables report the percentage of students performing at developing, accomplished, and exemplary levels[3] for each performance criterion, as well as the percentage of students performing at an accomplished level or above.

The minimum acceptable performance level for any outcome is to have 80% or more of the students (taking part in that assessment activity) performing at the accomplished or exemplary level for *all* performance criteria (for that assessment activity). Currently, the faculty use performance-criteria rubrics on class and lab assignments as direct measures. Since this is a new program with the third class of graduates expected in 2011–12, a senior exit survey and alumni survey have been developed as indirect measures.

The following is a set of tables for the outcomes assessed during the 2011–12 academic year. The outcomes are (a), (b), (c), (d), (e) (f), (g), (i), (j), (k), (l), and (m).

Outcomes (a), (c), (l), and (m) are due to the regular cycle; (b), (f), (i), and (k) are part of continuous improvement, as deemed necessary based on previous years' assessments; (d) is part of the institutional assessment for the current year, along with (l); and (d), (e) (g), and (j) were added as additional assessment activity to better understand the performance of the program and its graduates.

Each table is a summary of the various course assignments used to assess the outcomes with the rubric for that outcome. For each rubric, the targeted outcome and the performance criteria are fixed, but faculty have academic freedom to make adjustments to the descriptors of levels of achievement, which they are required to share with the assessment coordinator.

[3] Performance below the developing level is possible, although rare, and would correspond to little or no sign in the work sample for demonstrating understanding or accomplishment in that criterion.

Assessment (a)2: EE 431, Fall 2011, Prof. Dingman

This outcome was assessed using the last assignment of the term and a related question on the final examination. The assignment was to (electrically) overcome the physical (acoustical) limitations of a concert environment in a very large space. The exam question was to perform calculations from a diver's perspective under water.

Twelve students were assessed Fall 2011 using the performance criteria listed below. The minimum acceptable performance level was to have above 80% of the students performing at the accomplished or exemplary level in each of the performance criteria.

The table below summarizes the results of this targeted assessment. The results indicate that the minimum acceptable performance level of 80% was met on all performance criteria for this program outcome. Students met or exceeded expectations; they demonstrated their abilities to "apply knowledge of mathematics, science and engineering principles."

Table 6: Targeted Assessment for Outcome (a)

(a) an ability to apply knowledge of math, science and engineering				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students >= 2
Applying knowledge of mathematics	17%	58%	25%	83%
Applying knowledge of scientific principles	8%	42%	50%	92%
Applying knowledge of engineering principles	17%	67%	17%	83%

Assessment (a)4: EE 225, Spring 2012, Dr. Barnes

This outcome was assessed using a problem on a final exam.

Twelve students were assessed in the spring term of 2012 using the performance criteria listed below. The minimum acceptable performance level was to have above 80% of the students performing at the accomplished or exemplary level in each of the performance criteria. Ten of the twelve students, 83%, met the first criteria. The other two criteria were not applicable to this problem, which only involved a math problem, not one of engineering or scientific principles.

The table below summarizes the results of this targeted assessment. The results indicate that the minimum acceptable performance level of 80% was for the performance criterion for th

Table 9

Assessment (b)2 (continuous improvement): EE 305, Winter 2012, Dr. Shi

The outcome was assessed using the course project of EE305 Optoelectronics III taught Winter 2011. The project was set up as a replacement of lab experiments to test student's capability in designing and conducting experiments, and analyzing the data. This project was designed as a team based project. Two topics were assigned to two teams of senior and junior students. One team of students engaged in designing, conducting an experiment to measure attenuation of optical fiber to different wavelengths of light propagating in the optical fibers. The second team engaged in

Table 10: Targeted Assessment for Outcome (b)

(b

Assessment (b)3 (continuous improvement): EE 456, Winter 2012, Dr. Wang

This outcome was assessed in EE 456 Modern Control Systems, Winter 2012, using one midterm exam and one signal-design project set. The objectives were to engage the class in a midterm exam and a signal-design project on applying the knowledge of classical control theories in addressing practical control problems. The lab project involved using the hardware and software co-design with the modern PLC/PAC controllers, which are very practical in industrial control applications. The Automation Direct PAC 3000 system and Human Machine Interface (HMI) hardware and software co-design have been used in the signal design project, which provided students a very practical way of learning the Ladder diagram, PID controller design, root-locus method, etc. The students are required to demonstrate reading, writing, listening and speaking skills; identify the technical problem; developing a pla

3.3.7 Targeted Assessment of Outcome (c)

An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

<u>Assessment (c)1: REE 346, Fall 2011, Dr. Feng Shi, assessed by Prof. Zipay</u>

The outcome was assessed using the course project of REE346 Biofuel and Biomass taught Fall 2011. The project is a team-based project. The project involves an algae-related biodiesel-generation system. The objective of this project is to get students understanding the process of biodiesel generation from algae-growing through oil extraction to biodiesel production by involving an algae-growing reactor design, algae-growing process design, and algae-oil extractor design. The students of this class implemented their designs, tested the performance of their subsystems and evaluated the feasibilities of their systems. The class was divided into three groups to work on three subsystems of the project. The first team was working on the algae-growing reactor design, implementation, and test. The second team was working on the algae-growing process design, implementation, and test. And the third team was working on the algae-oil extractor design, implementation, and test. The project was adapted to assess the students' capability to design a system or a process to meet desired needs within realistic constraints. The algae-reactor design is used to test student ability to design a system that meets the requirements of supplying CO_2 and light efficiently, and harvesting algae easily; students were required to implement the solution within the time and financial constraints. The algae-growing group was required to design a process to grow algae with local strains of algae efficiently. The algae-harvesting and algae-oil extracting group was required to design a machine that could extract algae oil and that can be implemented within the constraints of current conditions.

Fourteen students were assessed Fall 2011

Table 12: Targeted Assessment for Outcome (c)

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students >= 2
Recognition of need	14%	43%	43	

Table 16: Targeted Assessment for Outcome (d)

(d) an ability to function on multi-disciplinary teams (Major Project)				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students >= 2

3.3.9 Targeted Assessment of Outcome (e)

An ability to identify, formulate, and solve engineering problems

Assessment (e)1: EE 456, Winter 2012, Dr. Wang

This outcome was assessed in EE 456 Modern Control Systems using one midterm exam set and one signal-design project set. The objectives were to engage the class in a midterm exam and a signal-design project on applying the knowledge of classical control theories in addressing practical control problems. The lab project involved using the hardware and software co-design with the modern PLC/PAC controllers, which are very practical in industrial control applications. The Automation Direct PAC 3000 system and Human Machine Interface (HMI) hardware and software co-design have been used in the signal design project, which(s) 0.3 (ig)(s) 0.3 (3 (ig)(s) 0.3 (30] TJ ET8cm BT 50

Recommendations based on the End-of-Year Faculty Review of Outcome (f)

Students performed higher than the desired level. No weaknesses have been observed so far.

Improved performance has been recorded in this outcome. Further discussion during the regularly scheduled faculty meetings during the spring term of 2012 resulted in clarification among the faculty as to the meaning of the outcome and its assessment:

3.3.11 Targeted Assessment of Outcome (g)

An ability to communicate effectively

Assessment (g)1 (additional assessment): EE 321, Fall 2011, Dr. Barnes

Assessment (g)2 (additional assessment): EE 225, Fall 2011, Prof. Vurkaç

This outcome was assessed using a multi-faceted laboratory project and associated independent-learning assignment. The laboratory work consisted of a term-long characterization of a passive and

Recommendations based on the End-of-Year Faculty Review of Outcome (g)

This was an additional assessment performed to learn more about the EE program and its performance.

During closing-the-loop discussions, it was decided that oral communication needs to be specifically addressed during the 2012–13 academic year, perhaps in the senior project, and also that the rubric needs to be updated. The following recommendations from the OIT-Portland EET 2010–11 assessment report were adopted:

Students will be required to do at least one oral presentation for at least half of the upper-division core courses in the EE(T) curriculum. Students will be provided with guidelines for oral presentations as well as a copy of the rubric so that they can develop an adequate idea of the level expected and the criteria used for evaluation. After their presentation, students will be provided

3.3.12 Targeted Assessment of Outcome (i)

A recognition of the need for, and an ability to engage in life-long learning

<u>Assessment (i)1 (continuous improvement): EE 225, Fall 2011, Prof. Vurkaç</u>

This outcome was assessed using a multi-faceted laboratory project (with an independent-learning

Table 21: Targeted Assessment for Outcome (i)

(i) a recognition of the need for, and an ability to, engage in lifelong learning				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students >= 2
Demonstrating an awareness that knowledge must be gained	71%	0%	29%	29%
Identifying, gathering and analyzing information	0%	100		

Assessment (i)2 (continuous improvement): EE 423, Winter 2012, Dr. Vurkaç

This outcome was assessed using a research paper. The assignment (hence, the paper) had three components: to discuss the scientific and historical context of the digital-IC industry, to find and explain the physical, mathematical, chemical, mechanical, and electrical aspects (as applicable) of an emerging technology in IC manufacturing, and to examine the socio-economic, environmental,

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Table 22: Targeted Assessment for Outcome (i)

Performance
Criteria

Recommendations based on the End-of-Year Faculty Review of Outcome (i)

Students performed satisfactorily for the most part in identifying, gathering and analyzing information in both courses. During the faculty discussion for closing the loop, the following recommendations were agreed upon.

- In order to gauge independent learning, students need to understand what is expected of them. To this end, assignments must be written so that students understand what is involved in demonstrating independent learning.
- Until about halfway through the junior year, students are occupied thoroughly with the accumulation of tools and techniques. Hence, the assessment of outcome (i) should take place mid-junior year or later. Some courses identified as candidates for further assessment of outcome (i) are EE 301, EE 325, EE 419, EE 423, EE 456, REE 407, REE 412, and REE 451. Emphasis will be placed on the EE courses for this assessment (for the EE program). During Fall 2012 convocation, the faculty will choose no fewer than three courses in which to assess this outcome again, this time with thorough written clarification to the students as to what is expected.

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Table 23: Targeted Assessment for Outcome (j)

Assessment (j)2 (additional assessment): EE 401, Spring 2012, Dr. Vurkaç

This outcome was assessed using a research paper on contemporary issues in communication technology. The assignment had three components corresponding to the three criteria for the OIT EERE rubric for contemporary issues:

- to discuss

Recommendations based on the End-of-Year Faculty Review of Outcome (j)

The primary question at the closing-the-loop meeting was whether the departmental faculty are responsible for cultivating awareness of contemporary issues in our students. The consensus was YES.

As a result of the discussion on how to do this, the faculty decided on a dedicated seminar. There was also a popular suggestion that all course syllabi indicate that knowledge of contemporary issues is a serious concern and a relevant aspect of becoming an engineer.

It was determined that multi-faceted assignments (as were used in the EE 423 assessment) are not a good way to judge student-learning outcomes. Book repor-0.3 (g)8BT 50 0 0(w) 0.5 8llET Q q 0 (c) 0.5 (e) 0.55

Assessment (k)2 (continuous improvement): EE 412, Winter 2012, Prof. Dingman, assessed by Dr. Vurkaç

This outcome was assessed using group oral presentations on video. Video was chosen to clearly and verifiably show students' proficiency on engineering software, programming, measuring and test equipment, prototyping, and also on communication (presentation) tools. This assessment was conducted near the end of the second term a three-term group project. The videos, which have been archived and are available for viewing, demonstrate that the students have capably and efficiently utilized all or most of the above-listed tools with success.

Twelve students were assessed Wi

Assessment (k)3 (continuous improvement): REE 449, Winter 2012, Prof. Zipay

This outcome was assessed using a preliminary design review (PDR) for the second course (three courses) of the capstone senior project. The three teams presented a 20 – 30 minute design review to the class and other faculty and staff members. In the PDR the teams discussed the project design, design decisions and the overall test plan. The teams received questions and feedback regarding the current project status to guide possible changes as the project approaches completion in spring term. The students discussed preliminary design solutions, how they chose one and how they plan to test and characterize the design choice. Teams were evaluated on how well they used design presentation tools in the PDR, how they used design CAE tools such as PSpice, LabVIEW, eQuest and custom CAE tools, and how they tested and characterized the prototype subsystems .

Ten students (on three teams) from EE and REE programs were assessed Winter 2012 using the performance criteria listed below. The minimum acceptable performance level was to have above 80% of the students performing at the accomplished or exemplary level in all performance criteria.

Table 27: Targeted Assessment for Outcome (k)

(k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

3.3.15 Targeted Assessment of Outcome (l)

Knowledge of differential and integral calculus and advanced mathematics, including differential equations, linear algebra, vector calculus, complex variables, sequences and series, Laplace transforms, Fourier transforms, and probability and statistics with appropriate applications

Assessment (l)2: EE 225, Fall 2011, Prof. Vurkaç

This outcome was assessed using a multi-faceted laboratory project (with an independent-learning component with outcome (i)) involving extensive use of Laplace transform methods in a term-long design, testing and characterization of a bandpass filter using *s*-domain techniques (Laplace analysis). The students were asked to provide detailed theoretical analysis as well as LTSpice and MATLAB simulations, oscilloscope captures, and photographic evidence of the actual circuit (even though the circuits were observed by the instructor while being built in the lab). Statistics and Probability were not pertinent to the course material. Students had the option of connecting the transform methods to their time-domain equivalents and exploring applied differential equations, although this did not reflect in their reports (discussed below).

Seven students in three teams were assessed Fall 2011 (in a small class due to it being a trailing course) using the performance criteria listed below. The minimum acceptable performance level was to have above 80% of the students performing at the accomplished or exemplary level in each of the performance criteria.

Table 28 summarizes the results of this targeted assessment. The results indicate that the minimum acceptable performance level of 80% was met on one of the performance criteria for this program outcome. Another criterion was inapplicable to the course and the project. The remaining criterion was applicable, but the reports do not reflect the students' knowledge or understanding of this application. Students did, however, meet or exceed expectations in terms of transform methods, demonstrating their abilities to apply mathematics and engineering principles to analyze and solve technical problems, but less so to predict experimental results. The main strength observed in this group and their work was that the writing quality was much higher than previously noted on similar assignments. Weaknesses, however, were many. Students might not have taken the report part of the project very seriously. They worked hard to make their circuits work, but they are not used to documenting such effort or its results. They also do not seem to be good at following instructions. This certainly is an opportunity for growth for the instructor. A big part of the problem may be that the project was due at the end the term, which gave no time for teacher feedback or reworking reports. This was based on giving the same assignment in the summer term in the past—the summer term may be too short to have the project due any sooner than the end of the term, but fall term is not. In the future, project reports need to be due sooner, perhaps incorporating a multi-stage revision process. It also seems it is not sufficient to show students examples of good reports. One tactic that has since been suggested is to show students weak or even average-quality reports as poor ones, accompanied by the rubric, and explain that they are expected to do better, as described in the rubric.

Table 28: Targeted Assessment for Outcome (l)

(l) a knowledge of differential and integral calculus and advanced mathematics including differential

Assessment (l)2: EE 341, Fall 2011, Dr. Klopf

This outcome was assessed using questions #1 and #2 of homework #8.

Seven students were assessed Fall 2011 using the performance criteria listed; one of the eight students in the class did not turn in any part of the assignment and was consequently not included in the assessment. Students did not meet expectations for any of the three criteria. The minimum acceptable performance level was to have above 80% of the students performing at the accomplished or exemplary level in each of the performance criteria.

Table 29 summarizes the results of this targeted assessment. The results indicate that the minimum acceptable performance level of 80% was not met on any of the performance criteria for this program outcome. The evaluation of criterion 1 involved the use of statistical concepts (mean and standard deviation), which were outside of the standard material for this class, but were included for the sake of the assessment process. Out of the seven students evaluated, six attempted the statistical part of problem #2. Out of these, only two correctly performed the entire calculationely pe

Table 29

3.3.16 Targeted Assessment of Outcome (m)

In addition to mathematics, knowledge of basic sciences, computer science, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components, as appropriate to program objectives

Assessment (m)1: EE 456, Winter 2012, Dr. Wang

This outcome was assessed in EE 456 Modern Control Systems using one midterm exam set and one signal-design project set. The objectives were to engage the class in a midterm exam and a signal-design project on applying the knowledge of classical control theories in addressing practical control problems. The lab project involved using the hardware and software co-design with the modern PLC/PAC controllers, which are very practical in industrial control applications. The Automation Direct PAC 3000 system and Human Machine Interface (HMI) hardware and software co-design have been used in the signal design project, which provided students a very practical way of learning the Ladder diagram, PID controller design, root-locus method, etc. The students are required to demonstrate reading, writing, listening and speaking skills; identify the technical problem; develop a plan to solve it in a group of two people, execute the experimental method for problem solving and produce a report on the lab

Table 30: Targeted Assessment for Outcome (m)

(m) knowledge of

Assessment (m)2: EE 412, Winter 2012, Prof. Dingman

This outcome was assessed using a group oral presentation on video of the second term summation of a three term group senior project. It was used to assess outcomes (k) and (m) by looking and listening for the listed criteria.

Twelve

Assessment (m)2: EE 412, Winter 2012, Prof. Dingman, assessed by Dr. Vurkaç

This outcome was assessed using group oral presentations on video. This assessment was conducted near the end of the second term a three-term group project. The videos, which have been archived and are available for viewing, provide verifiable examples of students demonstrating knowledge of basic sciences, computer science, and engineering science. Overall, the evidence for computer-

Assessment (m)3: REE 449, Winter 2012, Prof. Zipay

This outcome was assessed using a preliminary design review (PDR) for the second course (three courses) of the capstone senior project. The three teams presented a 20 – 30 minute design review to the class and other faculty and staff members. In the PDR the teams discussed the project design, design decisions and the overall test plan. The teams received questions and feedback regarding the current project status to guide possible changes as the project approaches completion in spring term. The students discussed preliminary design solutions, how they chose one and how they plan to test and characterize the design choice. Teams were evaluated on how well they used design presentation tools in the PDR, how they used design CAE tools such as PSpice, LabVIEW, eQuest and custom CAE tools, and how they tested and characterized the prototype subsystems .

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Ten students (on three teams) from EE and REE programs were assessed Winter 2012 using the performance criteria listed below. The minimum acceptable performance level was to have above 80% of the students performing at the accomplished or exemplary level in all performance criteria. One team project was designing an electric bike using a combination of fuel cells and batteries for energy storage. Another term is developing a -0.3 (t) -0.3 (e)( ) -63.7n(de) 0.5 -309.3 dee thr(de) 0.57 (d) 0q

Table 33: Targeted Assessment for Outcome (m)

(m) knowledge of basic sciences, computer science, and engineering sciences necessary to design and analyze complex electrical and electronic devices, SW and systems containing HW/SW components as appropriate to program objectives.				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students >= 2
Knowledge of basic sciences	10%	40%	50%	90%
Knowledge of computer sciences	20%	40%	40%	80%
Knowledge of engineering sciences	0%	20%	80%	100%

3.4 Summary of Direct-Measure Assessment for 2011–12

Strengths have been noted in the areas of conducting and analyzing experiments, designing systems and system components according to realistic specs and constraints, teamwork, problem-solving, ethics, and in the use of engineering tools and techniques. Students consistently demonstrated strong skills in problem-solving, design, and the use of engineering tools.

Recommendations

The recommendations are divided into two groups: those regarding the process of assessment, and those regarding program improvement.

In terms of assessment practices, it was determined that several of the guidelines of OIT EERE assessment passed down from prior academic years may be relaxed to allow better assessment of student-learning outcomes.

- Our rubrics are no longer required to have three and only three criteria. For example, in the rubric on contemporary issues, the inclusion of multiple concepts in criterion 1 was a holdover from the standard OIT EERE assessment practice of only three criteria per rubric. (Originally, this development was a natural and positive response to an even older set of departmental rubrics which had featured an excessive number of criteria, rendering the department's earliest assessment efforts prohibitively complex.) As a result of recent faculty discussions, it has become clear that we can move in the direction of a sensible middle ground: one of having more than three criteria if required to make the assessment activity meaningful. As long as this new guideline is not taken to extremes (with a prohibitively high number of criteria), the faculty feel that this is an improvement of our assessment process.
- Faculty are allowed (though not required) to state a desired performance level other than 80% (either higher or lower) for any criterion. This is aimed at reflecting the different levels of importance different criteria (or even outcomes) may have at various points in the curriculum, or even throughout the program.
- A performance level of "0" (no or insufficient evidence) may be added to rubrics. This is

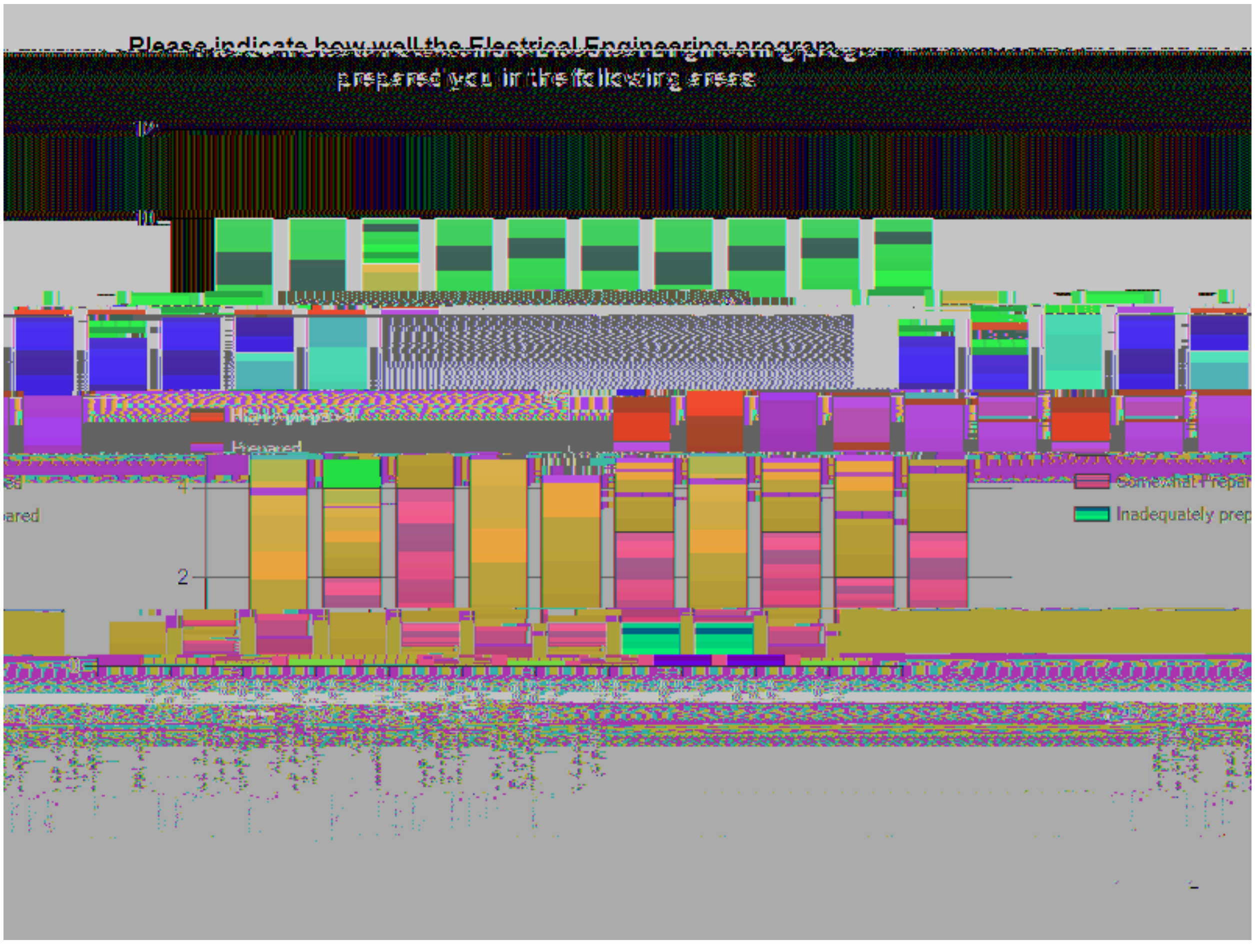
- Alternative rubrics from OIT-Portland, the OIT ISLOs, and individual program faculty may be used whenever they better target the outcome, or a specific criterion under inquiry.
- The mapping of outcomes and their assessment to oral versus written student presentations needs to be more carefully planned. This requires tighter two-way communication between the assessment coordinator and the faculty member carrying out the assessment.
- The number of outcomes assessed per assignment needs to be kept low (less than three).
- The assessment of outcome (i) should take place mid-junior year or later. Some courses identified as candidates for further assessment of outcome (i) are EE 301, EE 325, EE 419, EE 423, EE 456, REE 407, REE 412, and REE 451. Emphasis will be placed on the EE

- Contemporary issues will have an explicit place in the curriculum: mandatory sessions in senior project. Furthermore, all faculty are encouraged to state in their syllabi (and include in their lectures or assignments) the relevance and importance of an awareness of contemporary issues to modern engineers.

Appendix A: Academic-Year Direct-Assessment Activities

Appendix B: Indirect Assessment: Results of the Senior Exit Survey

Ten students took the senior exit survey during the spring term of 2012. All ten entered their student ID numbers. Five reported having accepted employment; one reported plans to continue education (who is known to have been accepted into several graduate programs); and four reported looking for employment. Of the five reporting employment already secured, all entered employer name, location, job title and salary. The student reporting graduate-school plans entered that they will be majoring in Computer Engineering at the Univeniveiv (or related) criteria when listed under the Institutional Student-Learning Outcomes (ISLOs) one page prior in the same survey, as shown in .



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The most common of the complaints is in terms of the availability of courses. While some courses are offered multiple times per year and have trailing sequences, it is true that some do not. The EE curriculum as listed in the OIT Catalog specifies “r

Appendix C: Indirect Assessment: Samples of the Senior Exit Survey

Selections of questions and answers from the senior exit survey follow.

Comments about advising (students' typos corrected in brackets):
"I feel my advisor has gone out of his way to make sure I am doing all I need to in order to graduate. He [has] bent over backwards in many ways to ensure my success here at [OIT]."

"My advisor when first enrolling was [name removed; former OIT professor] who deceased two months into my first term. I had minor issues with [name removed]

What have been the three BEST things about the major? (students' typos corrected in brackets):
"Student[–]professor relationship is by far the greatest advantage to OIT. I know all of my professors by name, and at one time or another they have been very gracious in helping me overcome an obstacle or pursue my endeavors. Some professors, particularly newer professors in the