Master of Science
Renewable Energy Engineering

2015-16 Assessment Report

Electrical Engineering and Renewable Energy Department

1 Introduction

1.1 Program Design and Goals

The Master of Science in

and potentially provides a point of contact for the development of specific opportunities with industries for students and faculty.

1.4 Program Locations

Among the advantages that make Oregon Tech an ideal institution for offering

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3 Cycle of Assessment for Program Outcomes

3.3.2 Methods for Assessment of Program Outcomes

At the beginning of the assessment cycle, an assessment plan is generated by the Assessment Coordinator in consultation with the faculty. This plan includes the outcomes to be assessed during that assessment cycle (according to Table 1), as well as the courses and terms where these outcomes will be assessed.

The MSREE mapping process links specific tasks within MSREE course projects and assignments to program outcomes and on to program educational objectives in a systematic way. The program outcomes are evaluated as part of the course curriculum primarily by means of assignments. These assignments typically involve a short project requiring the student to apply math, science, and engineering principles learned in the course to solve a particular problem requiring the use of modern engineering methodology and effectively communicating the results.

The mapping process aims to systemize the assessment of engineering coursework, and to provide a mechanism that facilitates the design of engineering assignments that meet the relevant outcomes, particularly those that are more distant from traditional engineering coursework. Rather than considering how the outcomes match the assignment, the assignment is designed to map to the program outcomes.

A systematic, rubric-based process is then used to quickly assess the level of attainment of a given program outcome, based on a set of performance criteria. The work produced by each student is evaluated according to the different performance criteria, and assigned a level of 1-developing, 2-accomplished, or 3-exemplary. The results for each outcome are then summarized in a table, and reviewed by the faculty at the annual Closing-the-Loop meeting.

The acceptable performance level is to have at least 80% of the students obtain a level of accomplished or exemplary in each of the performance criteria for any given program outcome.

If any of the direct assessment methods indicates performance below the established level, that triggers the continuous improvement process, where all the direct and indirect assessment measures associated with that outcome are evaluated by the faculty, and based on the evidence, the faculty decides the adequate course of action. The possible courses of action are these:

> Collect more data (if there is insufficient data to reach a conclusion as to whether the outcome is being attained or not); this may be the appropriate course of action when assessment was conducted on a class with low enrollment, and it is recommendable to re-assess the outcome on the following year, even if it is out-of-cycle, in order to obtain more data.

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there is sufficient data and an adequate assessment methodology already in place, and therefore there

Table 1 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, that is, at least 80% of students were able to identify, formulate, and solve energy-related engineering problems.

Table 1: Targeted Assessment for Outcome (a)

Outcome (a): an ability to identify, formulate, and solve energy-related engineering problems				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students >= 2
1 – Identify problems	1	2	2	80%
2 – Formulate problems	1	2	2	80%
3 – Solve problems	1	2	2	80%

Wilsonville, REE 529, Fall 2015 – Professor Frank Rytkonen

This outcome was assessed in REE 529 – Power Systems Analysis in Fall 2015 by means of a project. The term-long assignment consisted of designing an electrical power system for a combined-cycle power plant, developing a computer model of the system, performing analysis to determine power flow and short circuit characteristics, and updating engineering drawings.

Eight students were assessed in Fall 2015 using the performance criteria listed in the table 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 2 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

3.3.5 2015-2016 Indirect Assessment

In addition to direct assessment measures, the student outcomes were indirectly assessed through a graduate exit survey. The 2014-15 data collected in Spring 2015 was used in the last assessment report, which covers the period from Spring 2014 to Winter 2015. The indirect assessment data used in the 2014-15 report was not collected during the assessment cycle. In order to avoid this inconsistency, in this and the subsequent annual assessment reports, we will use indirect assessment data collected during spring term in the respective assessment cycle. To this end, the 2014-15 academic year senior exit survey, conducted in Spring 2015, will be used again in this assessment report, which covers the terms from Spring 2015 to Winter 2016.

The survey asked students to indicate how well the MSREE program prepared them in each of the three specified outcomes. Figures 1 and 2 show the results of the indirect assessment of the MSREE student outcomes for the 2014-2015 graduating class.

Eleven MSREE graduating students completed the survey, with 100% of respondents indicating that as a result of completing the MSREE program they feel prepared or highly prepared in each of the student outcomes. This suggests that graduates feel that they have attained the MSREE student outcomes. Both direct and indirect assessment indicate that the MSREE program is preparing students in the program's student outcomes.

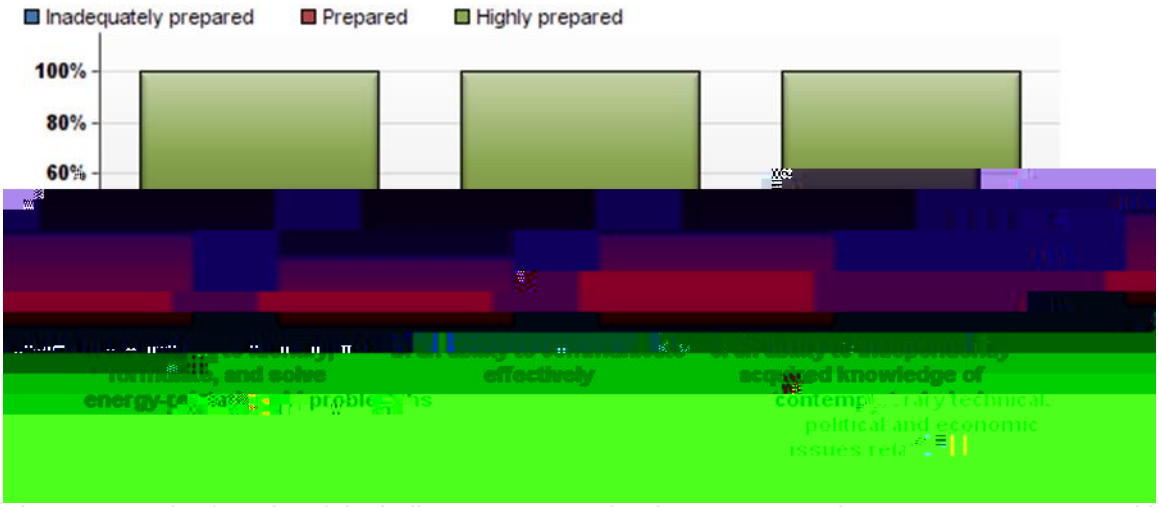

Figure 1: Graph of results of the indirect assessment for the MSREE Student Outcomes as reported in the Graduate Exit Survey (AY 2014-15).