

Master of Science
Renewable Energy Engineering

2018-19 Assessment Report

Electrical Engineering and Renewable Energy Department

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1 Introduction

1.1 Program Design and Goals

The Master of Science in Renewable Energy Engineering (MSREE) program at Oregon Institute of Technology (Oregon Tech) has been designed to prepare graduates to be energy engineering professionals who have advanced knowledge and skills that enable them to assume a broad range of technical leadership roles.

The MSREE program goal is to provide graduates for careers in areas of renewable energy engineering including but not limited to solar photovoltaics (PV), solar thermal, wind power, wave power, geothermal energy, clean transportation, energy storage, hydroelectric and traditional energy fields such as power systems, smart grid, energy management, energy auditing, energy systems planning, energy economics, energy policy and development, carbon accounting and reduction, and controls and instrumentation. MSREE graduates will enter renewable energy engineering careers as leaders in

2 Program Educational Objectives and Outcomes

2.1 Program Educational Objectives

3 Cycle of Assessment for Program Outcomes

3.1 Introduction and Methodology

The original assessment plan considered assessment of the program outcomes in different courses over a three-year cycle, as shown in Table 1. However, faculty found out that the selected courses were not representative of the program outcomes and the methodology had to be revised.

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 2), as well as the courses and terms where these outcomes will be assessed.

The program outcomes are evaluated as part of the course curriculum primarily by means of students' final theses or projects. These theses or projects require 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.

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

In addition to direct assessment measures, indirect assessment of the student outcomes is performed on an annual basis through a graduate exit survey.

The results of the direct and indirect assessment, as well as the conclusions of the faculty discussion at the Closing-the-Loop meeting are included in the annual MSREE Assessment Report, which is reviewed by the

Table 3. 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 \geq 2
Identify problems		2	2	100
Formulate problems	2		2	50
Solve problems		2	2	100

3.3.4.2 Targeted Assessment for Outcome (b): an ability to communicate effectively

This outcome was assessed in REE 599 – Graduate Thesis or Project by means of an evaluation of a final graduate-

Table 5 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 5. Targeted Assessment for Outcome (c)

Outcome (c): an ability to independently acquired knowledge of contemporary technical, political and economic issues related to energy				
Performance Criteria	1-Developing	2-Accomplished	3-Exemplary	%Students \geq 2
Knowledge of contemporary issues		3	1	100
Identifying, gathering and analyzing information		3	1	100

3.3.5 2018-2019 Indirect Assessment

In addition to direct assessment measures, the student outcomes are normally indirectly assessed through a graduate exit survey. The indirect assessment data for the period 2018-19 were not available at the time of generating this report.

4 Changes Resulting from Assessment

4.1 Changes Resulting from the 2018-19 Assessment

This section describes the changes resulting from the assessment activities carried out during the academic year 2018-2019.

The results of the 2018-19 Assessment indicate that the minimum acceptable performance level of 80% at the levels "accomplished" or "exemplary" was met on performance criteria for the three assessed outcomes, with one exception. Only 50% of the thesis or projects assessed were identified to have an "exemplary" level for criterion **Formulate problems** outcome (a) an ability to identify, formulate, and solve energy-related engineering problems, whereas the remaining 50% was identified at "developing" level.

Faculty has decided on the collection of more data for outcome (a) as a course of action, since the assessed sample size is too small (four), and the number of thesis or projects falling under the minimum acceptable performance is two. This need to reassess outcome (a) coincides with the scheduled assessment for the following academic year 2019-20, according to the MSREE outcome assessment cycle presented in Table 2yi v1 0 3 nBT,4() Criterion **Formulate problems** be closely monitored.

4.2 Changes to Assessment Methodology

This section describes changes to the assessment methodology that were proposed in the 2018-2019 assessment cycle for implementation in the 2019-20 assessment cycle.

As mentioned in section 3.1, the MSREE outcome assessment cycle ~~was revised~~ and year 2018-19 was used to assess all three outcomes using REE 599 Graduate Thesis/Project. This course involves the final work of students in the MSREE degree and provides a window into the three program outcomes. Starting in AY 2019-