Master of Science in Manufacturing Engineering Technology
Annual Assessment Report for 2014-15

I. Introduction

The master's degree program in Manufacturing Engineering Technology offers courses in four curriculum content areas (CCA):

a. engineering science & design technology
b. manufacturing software & computer integration
c. advanced manufacturing materials & process technology
d. business, financial and management processes

The program was approved by the Oregon Higher Education Board in 2005. It offers master's degree at three locations of Oregon Tech, namely Klamath Falls, Wilsonville and Seattle. The program requires 45 credit hours of graduate work. In addition to the CCA credit hours, students must complete 12 credits toward thesis, or 3 to 9 credits toward an approved final project and 3 credits in graduate seminars. Students must take at least one course in each of the four CCAs and three courses in at least one CCA.

II. Program Mission, Objectives and Learning Outcomes

The faculty in the master's degree program in Manufacturing Engineering Technology reviewed the current mission, objectives, and learning outcomes during the 2014-15 academic year. Changes were made to the outcomes to better align with the curriculum content areas. The current version is listed below:

Program Mission

The mission of the Manufacturing Engineering Technology Master of Science Degree program is to produce engineering graduates with an advanced technical education that allows them to take on leadership roles in globally competitive manufacturing industries.

Educational Objectives

1. Provide manufacturing and non-manufacturing engineers with advanced technical and managerial skills that allow them to be the leaders in manufacturing industries.
2. Expand graduates' expertise through industry-based applied research, lab-based design and analysis.
3. Strengthen graduates' ability to work productively in a global manufacturing environment.

Learning Outcomes

The graduates of the Master of Science Degree program in Manufacturing Engineering Technology must demonstrate:

1. The ability to solve engineering problems using science and design technology.
2. The ability to integrate current computer tools for use in solving manufacturing problems.
3. The ability to use advanced manufacturing methods and materials to improve current manufacturing processes using a variety of tools, such as: product life cycle management, quality and inventory control, and planning techniques.
4. The ability to incorporate business, financial and management tools to improve manufacturing processes.
5. The ability to communicate effectively in both written and oral forms.

III. Plan for Assessment of Student Learning Outcomes

The faculty agreed that outcomes 1-4 which align with the four curriculum content areas will be assessed in the corresponding courses. Each time a course is taught, assessment results will be collected and results aggregated in this report. Outcome 5 will be assessed in the capstone event of the graduate program, either the thesis or project. In addition, faculty are considering the addition of WRI 521 Writing at the Graduate Level to the program curriculum which would provide another course for assessment.

IV. Summary of 2014-15 Assessment Activities

Manufacturing faculty met several times throughout the year to develop the new Student Learning Outcomes (SLOs) and an assessment plan for the program. In addition, faculty have worked on developing rubrics for each of the five SLOs to be used to assess student work in each program course beginning in the 2015-16 academic year.

Program faculty also discussed concerns related to students' ability to write appropriately at the graduate level. Based on review of graduate thesis, written work contains grammar errors, inconsistent formatting, lack of order and structure, and inappropriate referencing of sources. At the spring assessment meeting, the addition of WRI 521 Writing at the Graduate Level was proposed. This curricular change would provide the opportunity for synergy among graduate students in various graduate engineering programs. While there was general support from Klamath Falls faculty, Seattle faculty expressed concerns. The Seattle faculty feel that their students would be better served by a course only master's program. The possibility of adding this option for certain locations was discussed. Following further discussion during the Fall 2015 convocation, the program director will complete the necessary CPC process for recommended changes to be included in the 2016-17 catalog.

A rubric for SLO 1: "the ability to solve engineering problems using science and design technology," has been developed and is included in Appendix A. In addition, the program director is working with the WRI 521 instructor to develop oral and written communication rubrics that can be used throughout the program. The program director will work with program faculty to develop rubrics for SLOs 2-4. Data collection for all five SLOs will be implemented in all graduate courses starting Fall 2015.

Appendix A
Rubric for Solving Engineering Problems using Science and Design Technology

MSMFG SLO 1: The ability to solve engineering problems using science and design technology.

Performance Criteria	(1) Limited or no Proficiency	(2) Some Proficiency	(3) Proficiency	(4) High Proficiency
Identify an engineering problem.	Does not identify the problem clearly.	Defines problem but has missing elements or does not include important information.	Adequately defines problem, including sufficient basic information.	Clearly identifies problem or reiterates given problem, including underlying principles and scope. Demonstrates depth of understanding.
Make appropriate assumptions.	Does not identify assumptions or constraints, or makes errors in attempting to do so.	Identifies some assumptions and constraints but important elements are missing.	Identifies basic assumptions and constraints.	Clearly delineates realistic constraints & important assumptions that affect solution. Includes assumptions that are workable, usable, and/or valid.
Formulate a plan which will lead to a solution.	Does not develop a coherent plan to solve the problem.	Develops a marginal plan with some important elements missing.	Develops an adequate plan that leads to a plausible solution.	Develops a coherent & concise plan to solve the problem with alternative strategies and a clear path to solution. Plan smoothly flows from problem statement and assumptions.
Apply engineering and design technology principles to analyze the problem.	Does not use appropriate principles and/or design technology for analysis.	Performs a partial analysis, with some important element(s) missing.	Performs basic analysis using appropriate principles to solve problem.	Correctly applies analytical tools, techniques, and/or design technology to analyze the problem in depth. Clearly solves the problem. Includes alternative solutions.
Document results in an appropriate format.	Does not follow format or does not include understandable documentation.	Follows format but has missing elements. Documentation is incomplete or unclear.	Follows format and produces understandable documentation.	Follows given format in detail. Documentation is clear, understandable, polished, and organized.