Master's Degree Program in Manufacturing Engineering Technology
Annual Assessment Report for 2011-12

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. engineering management process

The program was approved by the Oregon Higher Education Board in 2005. It offers master's degree at three locations of OIT, 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 2011-12 academic year. 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 advanced mathematical, computational, and analytical methods appropriate to the discipline;
2. The ability to improve current manufacturing processes using a variety of techniques, including product life cycle management, quality and inventory control, and planning techniques.
3. The ability to use current computer tools for manufacturing problems.
4. The ability to plan and conduct professional activities (including manufacturing projects) in one or more areas of specialization in the discipline by using advanced knowledge.
5. Knowledge related to global awareness.
6. The ability to communicate effectively in both written and oral forms.

III. Three-Year Cycle for Assessment of Student Learning Outcomes

The faculty agreed that we will have six main outcomes and will assess one or two each year on a three-year cycle, as listed in Table 1 below.

Learning Outcomes	**'07-08**	**'08-09**	**'09-10**	**'10-11**	**'11-12**	**'12-13**
1.Ability to solve engineering problems using advanced mathematical, computational, and analytical methods appropriate to the discipline;	X			X		
2.Ability to improve current manufacturing processes using a variety of techniques including product life cycle management, quality and inventory control and planning techniques.			X			X
3.The ability to use current computer tools for manufacturing problems.		X			X	
4.Ability to plan and conduct professional activities (including manufacturing projects) in one or more areas of specialization in the discipline by using advanced knowledge.			X			X
5.Knowledge related to global awareness.		X			X	
6. Ability to communicate effectively in both written and oral forms.	X			X		

Table 1. Master's Program in Manufacturing Engineering Technology Assessment Cycle.

IV. Summary of 2011-12 Assessment Activities

Manufacturing faculty conducted formal assessment of two student learning outcomes during 2011–2012, as described below. The faculty assessed several graduate courses. Since there are currently only a small group of graduate students in each course, these results should be viewed with that in mind.

Student Learning Outcome #3: The ability to use current computer tools for manufacturing problems.

The Manufacturing faculty conducted an analysis of where this outcome is reflected in the curriculum. The mapping of this outcome to manufacturing courses can be found in Appendix A.

The faculty assessed three graduate courses. Since there are currently only a small group of graduate students, these results should be viewed with that in mind. The exams, final project, and other projects were used for the assessment. A rubric with a four-point proficiency scale (1 for no proficiency, 2 for some proficiency, 3 for proficient and 4 for high proficiency) was used to determine student progress. It is expected that 80% of the students will be at 3 or 4.

For Klamath Falls, the faculty used MFG 597 Plant Design & Materials Handling Systems (with seven students in the class) to assess this outcome. The results are shown in the Table 2 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Independently learn mfg software tool	Programming projects	1 – 4	80% at 3 or 4	Met criteria (86%)
Apply computer tool to an MFG problem	Programming projects	1 – 4	80% at 3 or 4	Met criteria (86%)
Develop application documentation of computer tool	Programming projects	1 – 4	80% at 3 or 4	Met criteria (86%)

Table 2. Assessment Results for SLO #3 in MFG 597 in winter term.

The above table shows that students met the required performance criteria for the learning outcome.

For the Wilsonville campus, the faculty planned to use MFG 535 Product Life Software (with four students in the class) to address the outcome. The assessment was not completed as planned. Program faculty have designed a new plan for assessment at this location and have set up steps to make improvements in the next year's assessment.

For the Seattle campus, the faculty used MFG 597 Optimal Design Computer Project (with eight students in the class) to address the outcome. The results are shown in Table 3 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Independently learn mfg software tool	Student projects	1 – 4	80% at 3 or 4	Met criteria (6/8)
Apply computer tool to an MFG problem	Student projects	1 – 4	80% at 3 or 4	Met criteria (6/8)
Develop application documentation of computer tool	Student projects	1 – 4	80% at 3 or 4	Not Met criteria (4/8)

Table 3. Assessment Results for SLO #3 in winter term.

The above table shows that students met the required performance criteria. (Note: there was a small sample size. It is difficult to draw conclusions for criteria # 3. More observation is needed in the future when this criterion is assessed again.

Summary of assessment for SLO#3:

 # 3 Ability to use current computer tools for manufacturing problems: Klamath Falls and Seattle

performance criteria for assessment	limited or no efficiency (1)	some proficiency (2)	proficiency (3)	high proficiency (4)
Independently learn		3/15	4/15	8/15
Apply computer tool to an MFG problem	1/15	2/15	3/15	9/15
Develop application documentation of computer tool	1/15	4/15	3/15	7/15

Table 4. Summary of assessment for SLO #3

Student Learning Outcome # 5: Knowledge related to global awareness.

The Manufacturing faculty conducted an analysis of where this outcome is reflected in the curriculum. The mapping of this outcome to manufacturing courses can be found in Appendix A.

For Klamath Falls, the faculty used MFG 507 (Graduate Seminar, with six students in the class) to assess this outcome. The results are shown in Table 5 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of global demographic trends.	Project report	1 – 4	80% at 3 – 4	Met criteria (100%)
Demonstrated understanding of the interconnectedness of the global economy.	Project report	1 – 4	80% at 3 – 4	Met criteria (100%)
Demonstrated understanding of the impact of global economy on political decision making	Project report	1 – 4	80% at 3 – 4	Met criteria (100%)
Demonstrated understanding of the impact of ideology, culture on decisions related to technology and access.	Project report	1 – 4	80% at 3 – 4	Met criteria (100%)

Table 5. Assessment Results for SLO #5 in (spring term)

The above table shows that students met the required performance criteria.

For Seattle, the faculty did not assess this SLO.

For Wilsonville, faculty planned to use MFG 507 Graduate Seminar (with seven students in the class) to assess this outcome. The assessment was not completed as planned. Program faculty have designed a new plan for assessment at this location and have set up steps to make improvements in the next year's assessment.

Summary of assessment for SLO#5:

 # 5 Knowledge related to global awareness: Klamath Falls only

performance criteria for assessment	limited or no proficiency (1)	some proficiency (2)	proficiency (3)	high proficiency (4)
Demonstrated knowledge of global demographic trends.			1/13	5/6
Demonstrated understanding of the interconnectedness of the global economy.			1/13	5/6
Demonstrated understanding of the impact of global economy on political decision making			1/13	5/6
Demonstrated understanding of the impact of ideology, culture on decisions related to technology and access.			1/13	5/6

Table 6. Summary of Assessment for SLO #5

V. Summary of Student Learning Outcomes

During the 2011-12 academic year, the faculty of Master Program of Manufacturing Engineering Technology formally assessed the student learning outcomes summarized below.

Student Learning Outcome #3: The ability to use current computer tools for manufacturing problems.

The above result shows that students have met the performance criteria.

Student Learning Outcome #5: Knowledge related to leadership and global awareness.

The above result shows that students have met the performance criteria.

Appendix A

SLO – Curriculum Matrix

Curriculum	SLO # 3 Computer Tools	SLO #5 Global Awareness
MFG 597	**X (Klamath Falls)**	
MFG 597	**X (Seatle)**	
MFG 535	**X (Wilsonville)**	
MFG 507		**X (Klamath Falls)**
n/a		**X (Seattle)**
MFG 507		**X (Wilsonville)**