Master's Program of Manufacturing Engineering Technology
Annual Assessment Report for 2008-09

I. Introduction

The master's 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 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 program of Manufacturing Engineering Technology communicated via emails during fall 2007 to review the current program. After some discussions, we agreed upon the final version as 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 2008-09 Assessment Activities

Manufacturing faculty conducted formal assessment of two student learning outcomes during 2008 – 2009, as described below:

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 598 CNC Programming 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	Lab report	1 – 4	80% at 3 or 4	100%
Apply computer tool to an MFG problem	Project report	1 – 4	80% at 3 or 4	100%
Develop application documentation of computer tool	Project report	1 – 4	80% at 3 or 4	100%

Table 2. Assessment Results for SLO #3 in MFG 598 in 08 fall term

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

For the Portland campus, the faculty used MFG 536 Auto Tech for Tool Path Generation 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	Lab programming projects	1 – 4	80% at 3 or 4	100%
Apply computer tool to an MFG problem	Ditto	1 – 4	80% at 3 or 4	100%
Develop application documentation of computer tool	Ditto	1 – 4	80% at 3 or 4	67%

Table 3. Assessment Results for SLO #3 in MFG 536 in 08 fall term

The above table shows that all three students met the first two required performance criteria, but one student did not meet the third performance criteria. Because there was a small sample size, it is difficult to draw conclusions.

Summary of assessment for SLO#3:

 # 3 Ability to use current computer tools for manufacturing problems: all locations

performance criteria for assessment	limited or no efficiency (1)	some proficiency (2)	proficiency (3)	high proficiency (4)	% at 3 or 4
Independently learn	0	0	2/8	6/8	100%
Apply computer tool to an MFG problem	0	0	3/8	5/8	100%
Develop application documentation of computer tool	0	1/8	3/8	4/8	88%

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 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.	Term report	1 – 4	80% at 3 – 4	100%
Demonstrated understanding of the interconnectedness of the global economy.	Term report	1 – 4	80% at 3 – 4	100%
Demonstrated understanding of the impact of global economy on political decision making	Term report	1 – 4	80% at 3 – 4	100%
Demonstrated understanding of the impact of ideology, culture on decisions related to technology and access.	Term report	1 – 4	80% at 3 – 4	100%

Table 5. Assessment Results for SLO #5 in (09 winter term)

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

For Boeing, the faculty used MFG 596 Sustainable Manufacturing to assess this outcome. The results are shown in the table below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of global demographic trends.	Term report	1 – 4	80% at 3 – 4	50%
Demonstrated understanding of the interconnectedness of the global economy.	Term report	1 – 4	80% at 3 – 4	50%
Demonstrated understanding of the impact of global economy on political decision making	Term report	1 – 4	80% at 3 – 4	50%
Demonstrated understanding of the impact of ideology, culture on decisions related to technology and access.	Term report	1 – 4	80% at 3 – 4	50%

Table 6. Assessment Results for SLO #5 in (09 winter term)

Note: there was a small sample size (2 students). It is difficult to draw conclusions.

For Portland, faculty used MFG 521 Management Team in Global Enterprise to assess this outcome. The results are shown in table 6 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of global demographic trends.	Term report	1 – 4	80% at 3 – 4	0%
Demonstrated understanding of the interconnectedness of the global economy.	Term report	1 – 4	80% at 3 – 4	0%
Demonstrated understanding of the impact of global economy on political decision making	Term report	1 – 4	80% at 3 – 4	100%
Demonstrated understanding of the impact of ideology, culture on decisions related to technology and access.	Term report	1 – 4	80% at 3 – 4	100%

Table 7. Assessment Results for SLO #5 in (09 winter term)

Note: there was a small sample size (3 students). It is difficult to draw conclusions.

 # 5 Knowledge related to global awareness: all locations

performance criteria for assessment	limited or no efficiency (1)	some proficiency (2)	proficiency (3)	high proficiency (4)	% at 3 or 4
Demonstrated knowledge of global demographic trends.	0	3	5	3	73%
Demonstrated understanding of the interconnectedness of the global economy.	0	4	2	5	64%
Demonstrated understanding of the impact of global economy on political decision making	1	0	9	1	91%
Demonstrated understanding of the impact of ideology, culture on decisions related to technology and access.	1	0	5	5	91%

Table 8. Summary of Assessment for SLO #5

V. Summary of Student Learning Outcomes

During the 2008-09 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 met the required performance criteria for the learning outcome.

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

Strengths: The above result shows that students met the required performance criteria for demonstrating understanding of the impact of global economy on political decision making, and for demonstrating understanding of the impact of ideology and culture on decisions related to technology and access.

Weaknesses: Students did not meet the 80% target on the performance criteria for demonstrating knowledge of global demographic trends, and for demonstrating understanding of the interconnectedness of the global economy.

Plans for improvement: Due to small numbers in the graduate program, the graduate seminar topic of global awareness will not be taught every year. However, this learning outcome will be assessed every three years. The two performance criteria that were not met will receive extra instruction and emphasis in future course offerings.

Appendix A

SLO – Curriculum Matrix

Curriculum	SLO # 3 Computer Tools	SLO #5 Global Awareness
Manufacturing Software & Computer Integration		
MFG 598	**X (Klamath Falls)**	
MFG 597	**X (Boeing)**	
MFG 536	**X (Metro)**	
MFG 507		**X (Klamath Falls)**
MFG 596		**X (Boeing)**
MFG 507		**X (Metro)**