Master's Degree Program in Manufacturing Engineering Technology
Annual Assessment Report for 2010-11

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, Portland 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 2010-11 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 2010-11 Assessment Activities

Manufacturing faculty conducted formal assessment of two student learning outcomes during 2010–2011, 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.

SLO #1. Ability to solve engineering problems using advanced mathematical, computational, and analytical methods appropriate to the discipline.

The faculty assessed this outcome using the following performance criteria:

1) Computation accuracy in mid-term exam
2) Ability to use theoretical principles
3) Ability to apply mathematical techniques
4) Ability to relate theoretical concepts requiring mathematical analysis to practical problems

For Klamath Falls, the faculty used MFG 598 Automated Tool Path Development, Fall Term 2010, taught by Professor David Culler, to assess this outcome. There were 6 students involved in this assessment. The results are shown in Table 2.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Computation accuracy in mid-term exam	midterm exam; applied problems that require application of calculations and manufacturing theory	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)
Ability to use theoretical principles	midterm exam; applied problems that require application of calculations and manufacturing theory	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)
Ability to apply mathematical techniques	midterm exam; applied problems that require application of calculations and manufacturing theory	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)
Ability to relate theoretical concepts requiring mathematical analysis to practical problems	midterm exam; applied problems that require application of calculations and manufacturing theory	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)

Table 2. Assessment Results for SLO #1 in MFG 598, fall 2010, Klamath Campus

Discussion of the assessment result: all students received a three or higher on each performance criteria; the criteria were met at Klamath Falls campus.

For the Seattle campus, the faculty used MFG 597, Applied Finite Element Analysis for the fall term to address the outcome. But due to unforeseen changes in leadership at the Seattle campus assessment data was incomplete and therefore the results were unusable for sound assessment although this data is available. There is a current search in progress to rebuild the structure of the program at the Seattle location. Assessment plans are in place for assessment activities to resume in the 2011-12 academic year.

For the Portland Campus, the faculty used MFG596 Advanced Design of Pressure Vessels to assess this outcome in fall 2010. There were 3 students involved in the assessment. The results are shown in Table 3.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Computation accuracy in mid-term exam	Mid-term exam	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)
Ability to use theoretical principles	Mid-term exam	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)
Ability to apply mathematical techniques	Mid-term exam	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)
Ability to relate theoretical concepts requiring mathematical analysis to practical problems	Mid-term exam	1 – 4 proficiency scale	80% at 3 or 4	Met criteria (every student got 3 or more on the score)

Table 3. Assessment Results for SLO #1 in MFG596 Advanced Design of Pressure Vessels fall 2010, Portland Campus

Discussion of the assessment result: all students received a three or higher on each performance criteria; the criteria were met at Portland campus.

SLO #6. Ability to communicate effectively in both written and oral forms.

The faculty assessed this outcome using the following performance criteria:

1) Clearness and conciseness of summary of understanding of the projects
2) Knowledge of the subject
3) Presentation organization
4) Quality in delivery and discussion

For Klamath Falls, the faculty used MFG 598 Automated Tool Path Develop, Fall Term 2010, taught by Professor David Culler, to assess this outcome. There were 8 students involved in this assessment. The results are shown in Table 4.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Clearness and conciseness of summary of understanding of the projects	presentation and accompanying report	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)
Knowledge of the subject	presentation and accompanying report	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)
Presentation organization	presentation and accompanying report	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)
Quality in delivery and discussion	presentation and accompanying report	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)

Table 4. Assessment Results for SLO #6 in MFG 598, fall 2010

Discussion of the assessment result: all students received a three or higher on each performance criteria; the criteria were met at Klamath Falls campus.

For Seattle campus, the faculty used MFG 597, Applied Finite Element Analysis for the fall term to address the outcome. But due to unforeseen changes in leadership at the Seattle campus assessment data was incomplete and therefore the results were unusable for sound assessment although this data is available. There is a current search in progress to rebuild the structure of the program at the Seattle location. Assessment plans are in place for assessment activities to resume in the 2011-12 academic year.

For Portland, faculty used MFG 596 Adv Design of Mfg Pressure Vessels to assess this outcome. There were 3 students involved in the assessment. The results are shown in Table 5.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Clearness and conciseness of summary of understanding of the projects	The multivolume ASME PV Code was the basis of class discussion and written homework and mid-term exam	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)
Knowledge of the subject	The multivolume ASME PV Code was the basis of class discussion and written homework and mid-term exam	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)
Presentation organization	The multivolume ASME PV Code was the basis of class discussion and written homework and mid-term exam	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)
Quality in delivery and discussion	The multivolume ASME PV Code was the basis of class discussion and written homework and mid-term exam	1 – 4 proficiency scale	80% at 3 – 4	Met criteria (every student got 3 or more on the score)

Table 5. Assessment Results for SLO #6 in MFG 596 Adv Design of Pressure Vessels, fall 2010, Portland Campus.

Discussion of the assessment result: all students received a three or higher on each performance criteria; the criteria were met at Portland campus.

V. Summary of Student Learning Outcomes

During the 2010-11 academic year, the faculty in the Master’s Degree Program in Manufacturing Engineering Technology formally assessed the student learning outcomes summarized below.

SLO #1. Ability to solve engineering problems using advanced mathematical, computational, and analytical methods appropriate to the discipline.

Students met all performance criteria for this learning outcome. No further action is required at this time.

SLO #6. Ability to communicate effectively in both written and oral forms.

Students met all performance criteria for this learning outcome. No further action is required at this time.