**Mechanical Engineering Technology**
**2012-13 Assessment Report**

## I. Introduction

The Bachelor of Science program in Mechanical Engineering Technology is offered in three locations—Klamath Falls, Portland Metro Center, and at the Seattle campus located at Boeing. In Klamath Falls and Seattle the entire program is offered; the Portland campus offers a degree-completion program (i.e. only Junior and Senior courses are offered, the lower-division courses are expected to be taken at a community college). During the years 2004-2009, overall enrollment ranged from 145 to 120, with a high during 2005 of 147 students. Fall term 2011 enrollment was 101 full and part-time students. During the 2010-11 year, the program graduated a total of 18 students. Of the seven 2011graduates responding, an average salary of $61,900 was reported.

The Mechanical Engineering Technology (MET) Program at Oregon Institute of Technology (OIT) was first accredited by ABET in 1970. There have been no major program changes since the last ABET visit in fall 2008. Based on recommendations from the MMET Industry Advisory Council, curricular changes have been made in the past three years to keep the program current: board drafting has been replaced with CAD and sketching has been included in the orientation class and elective courses have been added to provide exposure to new technologies related to lean manufacturing, composites and alternative forms of energy such as wave energy.

However, the Manufacturing and Mechanical Engineering and Technology (MMET) Department in which the MET Program resides has experienced numerous changes and upgrades over the past six years. The first major change was the merger of the Manufacturing Engineering Technology Department with the Mechanical Engineering Technology Department in 2004. This was done to increase administrative efficiency. The result was a stronger program with more resources available and better faculty collaboration. The second major change was the addition of a Bachelor of Science in Mechanical Engineering Degree Program; with the first students graduating in 2007. The Fall 2010 visit from the ABET review committee for Mechanical Engineering was very positive and moved the program toward full accreditation. The result has been a stronger program with more resources available and better faculty collaboration.

## II. Program Mission, Objectives and Student Learning Outcomes

Following a fall 2008 ABET visit, the faculty revisited the program educational objectives and revised them. These were reviewed and approved by the faculty and the program's industrial advisory council in fall 2009. The new objectives are listed below. The faculty reviewed and reaffirmed the mission, program educational objectives and student learning outcomes in the fall 2011 assessment meeting.

### Mission Statement

The Mechanical Engineering Technology Program at Oregon Institute of Technology is an applied engineering technology program. Its mission is to provide graduates with the skills and knowledge for successful careers in mechanical and manufacturing engineering.

### Program Educational Objectives

Program educational objectives (PEO's) are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. The Program Educational Objectives of OIT's mechanical engineering technology program are established to produce graduates who:

- are able to analyze and design practical mechanical systems.
- communicate effectively and work well on team-based engineering projects.
- succeed in mechanical and manufacturing engineering positions.
- pursue continued professional development.

The faculty planned an assessment cycle for the program's educational objectives as shown in Table 1 below.

| Program Objective Assessment Cycle | 2010-11 | 2011-12 | 2012-13 |
|---|---|---|---|
| Review Program Mission and Educational Objectives by the industrial advisory committee | | x | |
| Assess Program Educational Objectives | | | x |

Table 1. Program Education Objectives Assessment Cycle

The MMET Faculty reviewed the program mission and educational objectives during convocation on September 18, 2012. The Faculty of MMET, with representatives from the 3 campuses determined that the current Mission and Educational Objectives accurately represent the department's views about our MET program.

The MMET Industrial Advisory Committee met April 19, 2013. An issue that was discussed in the meeting was a need to increase student understanding of the importance of proper part dimensioning and 2D communication. The faculty agree that this improvement needs to be implemented in all MMET programs throughout the curriculum. Action plans for this item are currently being discussed, a timeline for implementation will be determined at the 2013 fall convocation.

In addition, a follow up survey was distributed to all IAC members soliciting feedback on the programs in general and the specific program educational objectives. Fourteen members of the IAC responded providing comments about the current program and recommendations for potential improvements. In general comments focused on the strength of the hands on nature of the MMET programs and recommendations for additional emphasis on team based projects and communication skills especially oral communication skills. The following table summarizes the feedback on the effectiveness of the program educational objectives.

**Student Learning Outcomes**

The Mechanical Engineering Technology Program outcomes have been mapped to the ABET a-k outcomes, located in Appendix A. Within this report outcomes will be referenced by the ABET a-k nomenclature. These are listed below for reference. An engineering technology program must demonstrate that graduates have:

a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines
b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology
c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes
d. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives
e. An ability to function effectively on teams
f. An ability to identify, analyze and solve technical problems
g. An ability to communicate effectively

h. A recognition of the need for, and an ability to engage in lifelong learning
i. An ability to understand professional, ethical and social responsibilities
j. A respect for diversity and a knowledge of contemporary professional, societal and global issues
k. A commitment to quality, timeliness, and continuous improvement.

In addition to the eleven a-k outcomes, there is an additional outcome identified through the ABET Mechanical Engineering specific criteria. This outcome is shown below.

MET a: Baccalaureate degree programs must demonstrate that graduates can apply specific program principles to the analysis, design, development, implementation, or oversight of more advanced mechanical systems or processes depending on program orientation and the needs of their constituents.

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

The faculty planned a three-year assessment cycle for the program's student learning outcomes as shown in Table 2 below.

| Student Learning Outcome | 2012-13 | 2013-14 | 2014-15 |
|---|---|---|---|
| a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines | | x | |
| b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology | | | x |
| c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes | | x | |
| d. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives | | | x |
| e. An ability to function effectively on teams | x | | |
| f. An ability to identify, analyze and solve technical problems | | | x |
| g. An ability to communicate effectively | | x | |
| h. A recognition of the need for, and an ability to engage in lifelong learning | | x | |
| i. An ability to understand professional, ethical and social responsibilities | x | | |
| j. A respect for diversity and a knowledge of contemporary professional, societal and global issues | x | | |
| k. A commitment to quality, timeliness, and continuous improvement | x | | |
| Met a. Baccalaureate degree programs must demonstrate that graduates can apply specific program principles to the analysis, design, development, implementation, or oversight of more advanced mechanical systems or processes depending on program orientation and the needs of their constituents. | | | x |

Table 2. Assessment Cycle

## IV. Summary of 2012-13 Assessment Activities

The Mechanical Engineering Technology faculty conducted formal assessment of four student learning outcomes during 2012-13. These four outcomes have been mapped to the curriculum as shown in Appendix A. The four outcomes are Outcome e **"**An ability to function effectively on teams"; Outcome i "An ability to understand professional, ethical and social responsibilities"; Outcome j "A respect for diversity and a knowledge of contemporary professional, societal and global issues"; and Outcome k "A commitment to quality, timeliness, and continuous improvement".

### Outcome e: An ability to function effectively on teams.

The faculty assessed this outcome using the following performance criteria:

Student will be able to:

1. Identify and achieve goal/purpose.
2. Assume roles and responsibilities as appropriate.
3. Interact appropriately with team/group members.
4. Recognize and help reconcile differences among team/group members.
5. Share appropriately in work of team/group.
6. Develop strategies for effective action.

Direct Assessment #1 Klamath Campus
The faculty assessed this outcome in senior project, using a team project, scoring each group with a rubric. These teams were comprised of students from all majors in the MMET Department. There were 4 mechanical engineering technology (MET), 6 manufacturing and 27 mechanical engineering students involved in the assessment. The results are shown in Table 2 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MMET Results | MET Results |
|---|---|---|---|---|---|
| Identify/achieve goal/purpose | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% | 100% |
| Assume roles/responsibilities | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 60% | 75% |
| Interacts appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 60% | 50% |
| Reconciles differences | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% | 50% |
| Shares appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 40% | 75% |
| Develops strategies | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 60% | 50% |
| Cultural Adaptation | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% | 75% |

Table 2. Assessment Results for SLO e, Klamath Campus

Strengths: Teams learned to pull together and achieve their goals; learning was part of the process.

Weaknesses: Students need additional knowledge and skills associated with project management prior to senior year. Students lack cultural awareness and communication training (gender communication) to be effective in diverse teams.

Indirect Assessment #1 Klamath Campus
The faculty asked same group of students to rate their group's performance using the same criteria as the faculty in Table 2 above. The results for all 37 students are shown in Table 3 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MMET Results |
|---|---|---|---|---|
| Identify/achieve goal/purpose | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 94.6% |
| Assume roles/responsibilities | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 81.1% |
| Interacts appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 83.8% |
| Reconciles differences | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 78.4% |
| Shares appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 73.0% |
| Develops strategies | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 81.1% |
| Cultural Adaptation | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 91.9% |

Table 3. Assessment Results for SLO e, Klamath Campus

Strengths: Students seem to agree with faculty that in spite of difficulty in some areas, ultimately they were able to achieve their goals as a group.

Weaknesses: Both students and faculty identify sharing work load appropriately as the greatest weakness.

Actions: Coach teams at the beginning of senior projects providing strategies to identify work assignments as part of the project planning stage as well as strategies for sharing information.

Direct Assessment #2 Wilsonville Campus
The faculty assessed this outcome in MET 437 Heat Transfer winter term 2013, using a team project, scoring each group with a rubric. There were two teams comprised of students from both Mechanical Engineering Technology and Manufacturing Engineering Technology. The results are shown in Table 4 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Identify/achieve goal/purpose | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 50% |
| Assume roles/responsibilities | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 50% |
| Interacts appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 50% |
| Reconciles differences | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Shares appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Develops strategies | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 50% |
| Cultural Adaptation | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |

Table 4. Assessment Results for SLO e, winter 2010, Portland Campus, faculty ratings

Strengths: Student divided work up and assign responsibilities without problems.

Weaknesses: Projects/expectations set too high, as time went on both motivation and performance decreased. *Make sure teams are large enough to absorb small disturbances, increase attendance at meetings/work assn.

Indirect Assessment #2 Wilsonville Campus
The faculty asked same group of students to rate their group's performance using the same criteria as the faculty in Table 4 above. The results are summarized in Table 5 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Identify/achieve goal/purpose | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Assume roles/responsibilities | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Interacts appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Reconciles differences | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Shares appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Develops strategies | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Cultural Adaptation | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |

Table 5. Assessment Results for SLO e, winter 2010, Portland Campus, student ratings

Strengths: Students appear confident in the ability to work in teams.

Weaknesses: None

Direct Assessment #3 Seattle Campus
The faculty assessed this outcome in MECH/MET 316 Machine Design II winter term 2013, using a team project, scoring each group with a rubric. There were five teams comprised of students from Mechanical Engineering, Mechanical Engineering Technology and Manufacturing Engineering Technology. The results are shown in Table 4 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Identify/achieve goal/purpose | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Assume roles/responsibilities | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Communicates effectively | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Reconciles disagreements | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Shares appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Develops strategies | Rubric, team | 1-4 proficiency | 80% score 3 or | 100% |

| | | | | |
|---|---|---|---|---|
| | project | scale | 4 | |
| Cultural adaptation | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |

Table 4. Assessment Results for SLO e, winter 2013, Seattle Campus, faculty ratings

Strengths: Two of the groups were very meticulous in addressing the various parts of the design project and sought some assistance along the way. They went beyond the project basic requirements.

Weaknesses: It was apparent that two of the groups waited until the last minute to complete the project and were not detailed in parts.

Indirect Assessment #3 Seattle Campus
The faculty asked the same group of ten students to rate their group's performance using the same criteria as the faculty in Table 4 above. The results are summarized in Table 5 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Identify/achieve goal/purpose | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Assume roles/responsibilities | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 89% |
| Communicates effectively | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 100% |
| Reconciles disagreements | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 89% |
| Shares appropriately | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 89% |
| Develops strategies | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 89% |
| Cultural adaptation | Rubric, team project | 1-4 proficiency scale | 80% score 3 or 4 | 56% |

Table 5. Assessment Results for SLO e, winter 2013, Seattle Campus, student ratings

Indirect Assessment #3 MMET Undergraduate Exit Survey
During the spring term, each graduating senior completes an exit survey. The survey includes questions on how well the program prepared the student on each SLO. This survey data is reviewed by faculty to determine any strengths or weaknesses as perceived by students on this SLO. A total of 19 seniors in mechanical engineering technology responded to the survey, representing all sites. For SLO e, 52.63% indicated that they were highly prepared and 47.37% indicated that they were prepared on this learning outcome.

## Outcome i: An ability to understand professional, ethical and social responsibilities.

The program faculty has agreed to use the following performance criteria for this learning outcome:

Performance criteria:
1. Evaluate the ethical issues related to a problem in the discipline.
2. Demonstrate knowledge of the professional code of ethics in their discipline.
3. Demonstrate professional behavior in the academic environment.

The evaluation of this outcome was broken up into two areas: ethics and professionalism.

*Ethics*

Direct Assessment #1 Klamath Campus
The faculty assessed this outcome in senior project, using a rubric-graded ethics homework assignment. There were 4 mechanical engineering technology (MET) students involved in the assessment. The results are shown in Table 6 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MET Results |
|---|---|---|---|---|
| Knowledge of professional code of ethics | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Describes ethics issue | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Describes parties involved and points of view | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Analyzes possible alternative approaches | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Supports approach & explains benefits/risks | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |

Table 6. Assessment Results for SLO i, fall 2009, Klamath Campus

Comments/Strengths/Weaknesses: Students did not demonstrate any difficulties with assignment or concepts

Direct Assessment #2 Wilsonville Campus
The faculty assessed this outcome in senior project, using a rubric-graded ethics homework assignment that was the same one used at the Klamath Campus. There were 8 MET students involved in the assessment. The results are shown in Table 7 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Knowledge of professional code of ethics | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 88% |
| Describes ethics issue | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Describes parties involved and points of view | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 88% |
| Analyzes possible alternative approaches | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 88% |
| Supports approach & explains benefits/risks | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 88% |

Table 7. Assessment Results for SLO i, Wilsonville Campus

Strengths: Except for 1 student, all students did well and demonstrated a good understanding of ethical issues, as well as how to resolve issues by analyzing alternatives and benefits/risks.

Weaknesses: None were identified

Direct Assessment #3 Seattle Campus
The faculty assessed this outcome in MET 491, senior project, using a rubric-graded ethics homework assignment that was the same one used at the Klamath Campus. There only one student involved in the assessment and they met the rating of 3 or 4 in all performance criteria.

*Professionalism*

Direct Assessment #1: All locations
The faculty rated the professionalism of graduating seniors using 12 performance criteria that were developed and agreed upon within the institution for the assessment of the ethics and professionalism institutional student learning outcome. There were 9 Klamath seniors, 1 Wilsonville senior, and 3 Seattle seniors included in the assessment. The results are shown in Table 9 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MET Results |
|---|---|---|---|---|
| Timeliness of work | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Quality of work (course expectations) | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Quality of work (work product) | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Attitude toward feedback | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Attitude toward assigned tasks | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Punctuality | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Attendance | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Academic Integrity | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Interpersonal skills | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 92.3% |
| Knowledge of classroom policies and procedures | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 83.3% |
| Work ethic | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |
| Appearance | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 84.6% |

Table 9: Assessment results for SLO i, all campuses

A reasonable sample of seniors was assessed in all locations. Faculty ratings indicate that students meet expectations in all areas of professionalism.

Indirect Assessment #1 MMET Undergraduate Exit Survey
During the spring term, each graduating senior completes an exit survey. The survey includes questions on how well the program prepared the student on each SLO. This survey data is reviewed by faculty to determine any strengths or weaknesses as perceived by students on this SLO. A total of 19 seniors in mechanical engineering technology responded to the survey, representing all sites. For SLO i, 57.89% indicated that they were highly

prepared and 42.11% indicated that they were prepared on this learning outcome. In addition students were asked to rate themselves on their ability to perform at a professional level for each of 12 criteria (timeliness, quality, attitude, punctuality, attendance, integrity, interpersonal skills, following policies and procedures, work ethic and personal appearance). All 19 students rated themselves as meeting or exceeding expectation in all areas of professionalism.

**Outcome j: A respect for diversity and a knowledge of contemporary professional, societal and global issues.** The faculty assessed this outcome using the following performance criteria:

The student will be able to:

Performance criteria for diversity:

1. Demonstrate knowledge of the importance of communicating, interacting, and working positively with individuals from other cultural groups.
    a. Demonstrates understanding of social customs of a foreign country.
    b. Demonstrates understanding of business etiquette of a foreign country.
    c. Demonstrates understanding of engineering production issues of a foreign country.

Performance criteria for professional, societal and global issues:

2. Demonstrate knowledge of global, societal or professional issues, including impact of engineering solutions, such as economic globalization, sustainability, energy issues, etc.
    a. Defines and explains the issue
    b. Identifies key elements of the issue
    c. Demonstrates understanding of impact of engineering solution(s)

*Diversity*

Direct Assessment #1 Klamath Campus
The faculty assessed this outcome in senior project, using a rubric-graded diversity homework assignment. There were 4 mechanical engineering technology students involved in the assessment. The results are shown in Table 10 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Knowledge of social customs | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Knowledge of business etiquette | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Knowledge of engineering production issues | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |

Table 10. Assessment Results for SLO j on diversity, fall 2012, Klamath Campus

Students were able to address the scenario presented related to issues of diversity. ANTH 452 Globalization was a required course for this cohort and seems to be effective in helping students understand issues associated with diversity and deal effectively with diverse cultures and situations.

Direct Assessment #2 Wilsonville Campus
The faculty assessed this outcome in senior project, using a rubric-graded diversity homework assignment that was the same one used at the Klamath Campus. There were 8 students involved in the assessment. The results are shown in Table 11 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Results |
|---|---|---|---|---|
| Knowledge of social customs | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Knowledge of business etiquette | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Knowledge of engineering production issues | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 88% |

Table 11. Assessment Results for SLO j on diversity, Portland Campus

All students performed well on this assessment, there were no weaknesses apparent.

Direct Assessment #3 Seattle Campus
The faculty assessed this outcome in MET 491, senior project, using a rubric-graded diversity homework assignment that was the same one used at the Klamath Campus. There were only two MET students involved in the assessment. Both students met expectations in knowledge of business etiquette, but showed weaknesses in knowledge of social customs and engineering production issues. With the limited results it is difficult to draw conclusions or make changes.

*Professional, Societal and Global Issues*

Direct Assessment #1 Klamath Falls Campus
The faculty assessed this outcome in senior project, using a rubric-graded engineering impacts homework assignment. There were 4 students involved in the assessment. The results are shown in Table 12 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MET Results |
|---|---|---|---|---|
| Global impact of engineering decisions | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Macro-economic impact of engineering solutions | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Environmental and social impact of engineering solutions | Rubric-graded assignment | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |

Table 12. Assessment Results for SLO j on engineering impacts, Klamath Falls Campus

Students were engaged with this assignment which was modified from the last time this assessment administered. The topic of portable energy is of interest to students and very relevant to daily life. Faculty recognize that this topic is something that students wanted to contribute to and talk about. In addition, students were provided with clear expectations in regards to performance criteria. It is recognized that for both these reasons, student performance exceeded expectations.

Direct Assessment #2 Wilsonville Campus
The professional, societal and global assignment was not administered to Wilsonville students.

Direct Assessment #3 Seattle Campus
The professional, societal and global assignment was not administered to Seattle students.

Indirect Assessment #1 MMET Undergraduate Exit Survey
During the spring term, each graduating senior completes an exit survey. The survey includes questions on how well the program prepared the student on each SLO. This survey data is reviewed by faculty to determine any strengths or weaknesses as perceived by students on this SLO. A total of 19 seniors in mechanical engineering

technology responded to the survey, representing all sites. For SLO j, 36.84%% indicated that they were highly prepared and 57.89%% indicated that they were prepared on this learning outcome.

**Outcome k: A commitment to quality, timeliness, and continuous improvement.** The faculty assessed this outcome using the following performance criteria:

1. Demonstrates responsibility for quality in personal work.
2. Meets deadlines and follows personal schedules.
3. Reevaluates work/designs with the aim to improve

Direct Assessment #1: Klamath Falls

The faculty rated the performance of graduating seniors using the three performance criteria above in conjunction with the institution's assessment of professionalism as described in SLO i. There were 5 MET Klamath seniors included in the assessment. The results are shown in Table 14 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MET Results |
|---|---|---|---|---|
| Timeliness of work | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Quality of work (course expectations) | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Quality of work (work product) | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Reevaluates work/designs with the aim to improve | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |

Table 14: Assessment results for SLO k, all campuses

Strengths: Faculty impression of students' professionalism seemed to improve from lower division courses to senior project. To emphasize the importance of a commitment to timeliness, quality and continuous improvement it is recommended that a panel of MECOP students lead a discussion in freshmen orientation and senior project courses.

Weaknesses: Timeliness, attendance and punctuality seemed to be areas of weakness for MMET students. These areas of professionalism have not been addressed at the program level, just the course level. A discussion among faculty about these concerns should take place at convocation or the annual assessment review meeting.

Direct Assessment #2: Wilsonville
The faculty rated the performance of graduating seniors using the three performance criteria above in conjunction with the institution's assessment of professionalism as described in SLO i. There were 11 MET Klamath seniors included in the assessment. The results are shown in Table 14 below.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | MET Results |
|---|---|---|---|---|
| Timeliness of work | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Quality of work (course expectations) | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Quality of work (work product) | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |
| Reevaluates work/designs with the aim to improve | Faculty Rating | 0-2 scale | 80% at 1 or 2 | 100% |

Strengths: Although all students did not perform up to 1 or 2, MET students all did well

Weaknesses: None noted

Indirect Assessment #1 MMET Undergraduate Exit Survey
During the spring term, each graduating senior completes an exit survey. The survey includes questions on how well the program prepared the student on each SLO. This survey data is reviewed by faculty to determine any strengths or weaknesses as perceived by students on this SLO. A total of 19 seniors in mechanical engineering technology responded to the survey, representing all sites. For SLO k, 52.63% indicated that they were highly prepared and 47.37% indicated that they were prepared on this learning outcome.

## Assessment of Program Educational Objectives:

The MMET Department sent out a survey to alumni and employers regarding the program educational objectives for all programs in the department in spring 2013.

Table 16 summarizes the ratings of employers of MMET graduates as well as their perceived level of importance for each objective. There were 17 employers who responded to the survey.

| Program Educational Objective | Graduates Exceed Expectations | Graduates Meets Expectations | Extremely Important | Very Important |
|---|---|---|---|---|
| Success in entry-level positions | 50.0% | 41.67% | 33.33% | 44.44% |
| Ability to analyze practical mechanical systems | 27.27% | 63.64% | 25% | 75% |
| Ability to design practical mechanical systems | 27.27% | 63.64% | 12.5% | 87.5% |
| Ability to improve practical mechanical systems | 36.36% | 54.55% | 25% | 62.5% |
| Ability to communicate effectively in writing | 41.67% | 58.33% | 33.33% | 66.67% |
| Ability to communicate effectively orally | 41.67% | 58.33% | 22.22% | 77.78% |
| Ability to communicate effectively using visuals, such as drawings or sketches | 50.0% | 50.0% | 37.5% | 62.5% |
| Ability to work on team-based engineering projects | 50.0% | 50.0% | 44.44% | 55.56% |

Table 16. Employer ratings of program education objectives, spring 2013

It should be noted that the 17 employers who responded were answering questions about MMET graduates in general. Employers report that teamwork, visual and written communication are the most important skills for graduate success. Employers also report that Oregon Tech students perform well in each of these areas.

Alumni were asked to evaluate the program education objectives by indicating that level of emphasis that should be placed on each. Table 17 summarizes the ratings of the 46 Manufacturing Engineering Technology alumni who responded to the survey.

| Program Educational Objective | More Emphasis | Adequate Emphasis | Less Emphasis |
|---|---|---|---|
| Ability to analyze practical mechanical systems | 40% | 60% | 0% |
| Ability to design practical mechanical systems | 39.02% | 58.54% | 2.44% |

| | | | |
|---|---|---|---|
| Ability to improve practical mechanical systems | 43.59% | 56.41% | 0% |
| Ability to communicate effectively in writing | 34.15% | 65.85% | 0% |
| Ability to communicate effectively orally | 41.46% | 58.54% | 0% |
| Ability to communicate effectively using visuals, such as drawings or sketches | 32.50% | 62.50% | 5% |
| Ability to work on team-based engineering projects | 41.46% | 56.10% | 2.44% |

Table 17. Alumni ratings of program education objectives, spring 2013

At this point, the educational objectives have been reviewed by the faculty, the Industrial Advisory Committee and now by the alumni. After reviewing the educational objectives with these three groups over the last few years, the manufacturing faculty feels that the results for the program's educational objectives are reasonable and appropriate. They will be periodically reviewed to see if there are any updates needed during the next assessment cycle. From the results of our assessment activities, the faculty also feels that the program is currently meeting those objectives with a reasonable confidence.

To explore graduate experiences with pursuing continued professional development, the program faculty also surveyed the alumni as to post-graduation experiences, as shown in Table 18 below.

| Program Educational Objective | Yes | No | Not Yet |
|---|---|---|---|
| Achieved professional registration | 16.67% | 63.33% | 20% |
| Pursued professional development opportunities | 76.92% | 20.51% | 2.56% |
| Pursued graduate studies | 39.47% | 44.74% | 15.79% |
| Successfully participated in research | 50.0% | 38.24% | 11.76% |

Table 18. Alumni feedback on professional development activities, spring 2013

The faculty is pleased with the results for alumni who have pursued professional development after graduation. They are also satisfied with the number of students who have pursued graduate studies and participated in research. One of consensus conclusions among faculty is that there is an existing culture and mentality among technology students that they want to immediately pursue their job/career interests and consider the possibility of future education and professional certification at a later time. We are trying to make a conscious effort to encourage them to pursue these objectives as soon as possible.

To explore employer perspectives on the continuing professional development of our graduates, the faculty also asked employers the questions shown in Table 19 below. As noted above, 17 employers responded to the survey.

| Question | Strongly Agree | Agree | Disagree | Strongly Disagree |
|---|---|---|---|---|
| MMET graduates are capable of pursuing professional registration. | 23.08% | 76.92% | 0% | 0% |
| MMET graduates usually achieve professional registration | 12.5% | 62.5% | 25% | 0% |
| MMET graduates pursue professional development opportunities. | 41.67% | 58.33% | 0% | 0% |
| MMET graduates are capable of pursuing graduate studies. | 30.77% | 69.23% | 0% | 0% |
| MMET graduates are capable of participating in research. | 30.77% | 69.33% | 20% | 0% |
| MMET graduates are successful participants in research. | 44.44% | 55.56% | 20% | 0% |

Table 19. Employer feedback on MMET graduate professional development, spring 2013

The faculty felt that the data is representative of the type of student enrolled in our engineering and technology programs. While some of them may pursue graduate studies, many are more drawn to working in a hands-on environment, and may be less inclined to work towards higher degrees and research. Many of them are excelling and satisfied with the path that their careers are currently taking.

## V. Summary of Student Learning

May 29, 2013 the program faculty met to discuss the assessment results on the student learning outcomes, summarized below:

### SLO e. An ability to function effectively on teams

Strengths: Teams learned to pull together and achieve their goals; learning was part of the process.

Weaknesses: Students need additional knowledge and skills associated with project management prior to senior year. Students lack cultural awareness and communication training (gender communication) to be effective in diverse teams. Both students and faculty identify sharing work load appropriately as the greatest weakness. Time management seems to be an issue that leads to team dysfunction.

Actions: 1) Create a set of guidelines for coaching based on the team work rubric. Review at convocation with program faculty and implement in senior project fall term. 2) Ask the IAC for input on team coaching ideas. 3) Have graduate students speak to senior project teams about their experience with teamwork in senior projects.

### SLO i. An ability to understand professional, ethical and social responsibilities.

Strengths: Students performed at a high level on this assignment. They understood the ethical implications and social responsibilities associated with the scenario provided. Students seemed to have a clear understanding of the engineering code of ethics.

Weaknesses: None apparent.

Actions: None needed at this time.

### SLO j. A respect for diversity and a knowledge of contemporary professional, societal and global issues

Strengths: Students were able to address the scenario presented related to issues of diversity. ANTH 452 Globalization was a required course for this cohort and seems to be effective in helping students understand issues associated with diversity and deal effectively with diverse cultures and situations.

Weaknesses: None apparent.

Actions: None needed at this time.

### SLO k. A commitment to quality, timeliness, and continuous improvement

Strengths: Faculty impression of students' professionalism seemed to improve from lower division courses to senior project indicating that students are developing these skills as they progress through the program.

Weaknesses: None apparent.

Actions: None needed at this time.

**Assessment of Program Educational Objectives:**
Comments: The faculty commented on the results from this assessment activity related to program educational objectives that included current students, alumni and industry representatives that are currently employing our graduates. Please refer to those comments in the previous section to review our findings. For now, the objectives seem to be well aligned with not only our own interpretation of the objectives but also with the needs expressed by industry in general. We do not want to make any changes unless there is clear evidence that the majority of people involved in the programs see it as necessary. This is an area that we continually want to monitor to stay aware of any changes or suggestions made by these 3 groups.

## VI. Changes Resulting from Assessment

**Multiple Outcomes: Project Management**
Following the review of 2011-12 assessment results for outcomes d, f and M1 and IAC recommendations, MGT 445 Project Management was added as a required course spring of junior year. The new requirement will be in the 2013-14 catalogue for new freshmen, in addition current students are being advised to select MGT 445 as the business/management restricted elective in the junior year. It is expected that improvement from this change will be apparent when these outcomes are assessed in 2014-15.

**Outcome g: Oral Communication**
Senior project faculty provided students with the Oregon Tech public speaking rubric prior to their final senior project presentations based on the recommendation from the assessment of outcome g (communication) in 2010-11. The intent of this action was to help students focus on their presentation skills that have been taught in prior courses. Faculty rated each senior project team's presentation using the same rubric. The results of the initial assessment in 2010-11 and spring 2013 are shown in Tables 20 and 21 respectively.

| Performance Criteria | Assessment Method | Measurement Scale | Minimum Acceptable Performance | Klamath Results | Portland Results |
|---|---|---|---|---|---|
| Content | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 90% | 36.4% |
| Organization | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 90% | 45.5% |
| Style | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 80% | 54.5% |
| Delivery | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 90% | 36.3% |
| Visuals | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 90% | 45.5% |

Table 20. Assessment Results for SLO g, fall 2010

| Performance Criteria | Assessment | Measurement | Minimum Acceptable | Klamath |
|---|---|---|---|---|

| | Method | Scale | Performance | Results |
|---|---|---|---|---|
| Content | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Organization | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Style | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Delivery | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |
| Visuals | Rubric-graded presentation | 1 to 4 proficiency scale | 80% score 3 or 4 | 100% |

Table 21. Assessment Results for SLO g, spring 2013

Based on the overall results and observations made related to oral communication and delivery effectiveness during student presentations of senior projects, all of our students met or exceeded expectations in all the criteria used for this SLO.

**MET Overall Assessment Program**

| | |
|---|---|
| slo d, f, M1 | submit CPC paper work for ENGR 445 |

Appendix A1
SLO-Curriculum Map

**Outcome e: An ability to function effectively on teams.**

I = Introduced R = Reinforced E = Emphasized

| | Freshman | | | Sophomore | | | Junior | | | Senior | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fall** | Math 111 | Coll Algebra | | MATH 252 | Integral Calc | | ENGR 236 | Elect Circuits | | MET 323 | Heat Transfer | |
| | MET 111 | Orient I | I | MET 160 | Materials I | | ENGR 266 | Comp Program | | MET 326 | EPS | |
| | WRI 121 | Eng Comp | | PHY 201/221 | Physics | | MET 315 | Machine Design I | | IMGT 345 | Engineer Economy | |
| | CHE 101 | Chem | | WRI 227 | Tech Report | | MET 360 | Materials II | | MET 490 | Senior Proj I | E |
| | CHE 104 | Chem Lab | | MET 241 | CAD I | | MET 363 | Instrum | R | WRI 321 | Adv Tech Wr | |
| | | Psy Elective | | | | | | | | | MET Elective | |
| **Win** | Math 112 | Trig | | ENGR 211 | Statics | | ENGR 212 | Dynamics | | MET 426 | FPS | |
| | MET 112 | Orient II | I | Math 254N | Vector Calc I | | ENGR 355 | Thermo | I | MET 437 | Heat Tran Lab | R |
| | MFG 103 | Welding | | MET 242 | CAD II | | MET 316 | Machine Design II | R | MET 491 | Senior Proj II | E |
| | WRI 122 | Eng Comp | | MFG 112 | Intro Mfg Proc | | MET 375 | Solid Modeling | | SPE 321 | Small Group | |
| | | Soc Sci Elective | | PHY 202/222 | Physics | | | Soc Sci Elective | | WRI 322 | Adv Tech Wr | |
| | | | | | | | | | | | MET Elective | |
| **Spr** | Math 251 | Diff Calc | | ENGR 213 | Strengths | | MET 313 | Applied Thermo | E | MET 492 | Senior Proj III | E |
| | MFG 120 | Mfg Proc I | | Math 361 | Stats I | | MET 415 | Design Project | | MFG 331 | Indust Controls | |
| | SPE 111 | Speech | | MET 218 | Fluids | E | MET 351 | FEA | | WRI 323 | Adv Tech Wr | |
| | | Econ Elective | | PHY 203/223 | Physics | | MFG 314 | GDT | | | Engineer Exam | |
| | | Hum Elective | | | | | | Hum Elective | | | Hum Elective | |
| | | | | | | | | | | | MET Elective | |
| | | | | | | | | | | | MET Elective | |

Appendix A2
SLO-Curriculum Map

**Outcome i: An ability to understand professional, ethical and social responsibilities.**

I = Introduced R = Reinforced E = Emphasized

| | Freshman | | | Sophomore | | | Junior | | | Senior | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fall** | Math 111 | Coll Algebra | | MATH 252 | Integral Calc | | ENGR 236 | Elect Circuits | | MET 323 | Heat Transfer | |
| | MET 111 | Orient I | I | MET 160 | Materials I | | ENGR 266 | Comp Program | | MET 326 | EPS | |
| | WRI 121 | Eng Comp | | PHY 201/221 | Physics | | MET 315 | Machine Design I | | IMGT 345 | Engineer Economy | |
| | CHE 101 | Chem | | WRI 227 | Tech Report | | MET 360 | Materials II | | MET 490 | Senior Proj I | E |
| | CHE 104 | Chem Lab | | MET 241 | CAD I | | MET 363 | Instrum | | WRI 321 | Adv Tech Wr | |
| | | Psy Elective | | | | | | | | | MET Elective | |
| **Win** | Math 112 | Trig | | ENGR 211 | Statics | | ENGR 212 | Dynamics | | MET 426 | FPS | |
| | MET 112 | Orient II | I | Math 254N | Vector Calc I | | ENGR 355 | Thermo | | MET 437 | Heat Tran Lab | |
| | MFG 103 | Welding | | MET 242 | CAD II | | MET 316 | Machine Design II | | MET 491 | Senior Proj II | E |
| | WRI 122 | Eng Comp | | MFG 112 | Intro Mfg Proc | | MET 375 | Solid Modeling | | SPE 321 | Small Group | |
| | | Soc Sci Elective | | PHY 202/222 | Physics | | | Soc Sci Elective | | WRI 322 | Adv Tech Wr | |
| | | | | | | | | | | | MET Elective | |
| **Spr** | Math 251 | Diff Calc | | ENGR 213 | Strengths | | MET 313 | Applied Thermo | | MET 492 | Senior Proj III | E |
| | MFG 120 | Mfg Proc I | | Math 361 | Stats I | | MET 415 | Design Project | R | MFG 331 | Indust Controls | |
| | SPE 111 | Speech | | MET 218 | Fluids | | MET 351 | FEA | | WRI 323 | Adv Tech Wr | |
| | | Econ Elective | | PHY 203/223 | Physics | | MFG 314 | GDT | | | Engineer Exam | |
| | | Hum Elective | | | | | | Hum Elective | | | Hum Elective | |
| | | | | | | | | | | | MET Elective | |
| | | | | | | | | | | | MET Elective | |

Appendix A3
SLO-Curriculum Map

**Outcome j: A respect for diversity and a knowledge of contemporary professional, societal and global issues.**

I = Introduced R = Reinforced E = Emphasized

| | Freshman | | | Sophomore | | | Junior | | | Senior | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fall** | Math 111 | Coll Algebra | | MATH 252 | Integral Calc | | ENGR 236 | Elect Circuits | | MET 323 | Heat Transfer | |
| | MET 111 | Orient I | I | MET 160 | Materials I | | ENGR 266 | Comp Program | | MET 326 | EPS | |
| | WRI 121 | Eng Comp | | PHY 201/221 | Physics | | MET 315 | Machine Design I | | IMGT 345 | Engineer Economy | |
| | CHE 101 | Chem | | WRI 227 | Tech Report | | MET 360 | Materials II | | MET 490 | Senior Proj I | E |
| | CHE 104 | Chem Lab | | MET 241 | CAD I | | MET 363 | Instrum | | WRI 321 | Adv Tech Wr | |
| | | Psy Elective | | | | | | | | | MET Elective | |
| **Win** | Math 112 | Trig | | ENGR 211 | Statics | | ENGR 212 | Dynamics | | MET 426 | FPS | |
| | MET 112 | Orient II | I | Math 254N | Vector Calc I | | ENGR 355 | Thermo | | MET 437 | Heat Tran Lab | |
| | MFG 103 | Welding | | MET 242 | CAD II | | MET 316 | Machine Design II | | MET 491 | Senior Proj II | E |
| | WRI 122 | Eng Comp | | MFG 112 | Intro Mfg Proc | | MET 375 | Solid Modeling | | SPE 321 | Small Group | |
| | | Soc Sci Elective | | PHY 202/222 | Physics | | | Soc Sci Elective | | WRI 322 | Adv Tech Wr | |
| | | | | | | | | | | | MET Elective | |
| **Spr** | Math 251 | Diff Calc | | ENGR 213 | Strengths | | MET 313 | Applied Thermo | | MET 492 | Senior Proj III | E |
| | MFG 120 | Mfg Proc I | | Math 361 | Stats I | | MET 415 | Design Project | R | MFG 331 | Indust Controls | |
| | SPE 111 | Speech | | MET 218 | Fluids | | MET 351 | FEA | | WRI 323 | Adv Tech Wr | |
| | | Econ Elective | | PHY 203/223 | Physics | | MFG 314 | GDT | | | Engineer Exam | |
| | | Hum Elective | | | | | | Hum Elective | | | Hum Elective | |
| | | | | | | | | | | | MET Elective | |
| | | | | | | | | | | | MET Elective | |

Appendix A4
SLO-Curriculum Map

**Outcome k: A commitment to quality, timeliness, and continuous improvement.**

I = Introduced R = Reinforced E = Emphasized

| | Freshman | | | Sophomore | | | Junior | | | Senior | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fall** | Math 111 | Coll Algebra | | MATH 252 | Integral Calc | | ENGR 236 | Elect Circuits | | MET 323 | Heat Transfer | |
| | MET 111 | Orient I | I | MET 160 | Materials I | | ENGR 266 | Comp Program | | MET 326 | EPS | |
| | WRI 121 | Eng Comp | | PHY 201/221 | Physics | | MET 315 | Machine Design I | | IMGT 345 | Engineer Economy | |
| | CHE 101 | Chem | | WRI 227 | Tech Report | | MET 360 | Materials II | | MET 490 | Senior Proj I | E |
| | CHE 104 | Chem Lab | | MET 241 | CAD I | | MET 363 | Instrum | | WRI 321 | Adv Tech Wr | |
| | | Psy Elective | | | | | | | | | MET Elective | |
| **Win** | Math 112 | Trig | | ENGR 211 | Statics | R | ENGR 212 | Dynamics | | MET 426 | FPS | |
| | MET 112 | Orient II | I | Math 254N | Vector Calc I | | ENGR 355 | Thermo | | MET 437 | Heat Tran Lab | |
| | MFG 103 | Welding | | MET 242 | CAD II | | MET 316 | Machine Design II | R | MET 491 | Senior Proj II | E |
| | WRI 122 | Eng Comp | | MFG 112 | Intro Mfg Proc | | MET 375 | Solid Modeling | | SPE 321 | Small Group | |
| | | Soc Sci Elective | | PHY 202/222 | Physics | | | Soc Sci Elective | | WRI 322 | Adv Tech Wr | |
| | | | | | | | | | | | MET Elective | |
| **Spr** | Math 251 | Diff Calc | | ENGR 213 | Strengths | R | MET 313 | Applied Thermo | | MET 492 | Senior Proj III | E |
| | MFG 120 | Mfg Proc I | | Math 361 | Stats I | | MET 415 | Design Project | E | MFG 331 | Indust Controls | |
| | SPE 111 | Speech | | MET 218 | Fluids | R | MET 351 | FEA | | WRI 323 | Adv Tech Wr | |
| | | Econ Elective | | PHY 203/223 | Physics | | MFG 314 | GDT | | | Engineer Exam | |
| | | Hum Elective | | | | | | Hum Elective | | | Hum Elective | |
| | | | | | | | | | | | MET Elective | |
| | | | | | | | | | | | MET Elective | |

## 2012-13 MMET Assessment Plan: Updated 09-28-12

| Klamath Falls | | | | | | Wilsonville | | | | | | Seattle | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SLO/Course | Term | Student Work | Who | T:drive | Report | SLO/Course | Term | Student Work | Who | T:drive | Report | SLO/Course | Term | Student Work | Who | T:drive | Report |
| **Teams (ETAC e, EAC d)** | | | | | | | | | | | | | | | | | |
| **ME** | | | | | | | | | | | | | | | | | |
| Sr Project | S12 | Grp fac eval | All | x | | | | | | | | | | | | | |
| Sr Survey | S13 | Online survey | Sloan | | | | | | | | | | | | | | |
| **MET** | | | | | | | | | | | | | | | | | |
| Sr Proj | S12 | Grp fac eval | All | x | | Sr Proj | S12 | Grp fac eval | Peters | | | Sr Proj | S12 | Grp fac eval | Bridge | | |
| Sr Survey | S13 | Online survey | Culler | | | Sr Survey | S13 | Online survey | Peters | | | Sr survey | S13 | Online survey | Bridge | | |
| **MFG** | | | | | | | | | | | | | | | | | |
| Sr Proj | S12 | Grp fac eval | All | | | Sr Proj | S12 | Grp fac eval | Peters | | | Sr Proj | S12 | Grp fac eval | Bridge | | |
| Sr Survey | S13 | Online survey | Stuart | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| **Ethics and Professionalism (ETAC i, EAC f)** | | | | | | | | | | | | | | | | | |
| **ME** | | | | | | | | | | | | | | | | | |
| Sr Proj | F12 | Assignment | All | | | | | | | | | | | | | | |
| Prof Rating | S12 | Program fac | Sloan | | | | | | | | | | | | | | |
| Sr Survey | S13 | Online survey | Sloan | | | | | | | | | | | | | | |
| **MET** | | | | | | | | | | | | | | | | | |
| Sr Proj | F12 | Assignment | All | | | Sr Proj | F12 | Assignment | Peters | | | Sr Proj | F12 | Assignment | Bridge | | |
| Prof Rating | S12 | Program fac | Culler | | | Prof Rating | S12 | Program fac | Peters | | | Prof Rating | S12 | Program fac | Bridge | | |
| Sr Survey | S13 | Online survey | Culler | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| **MFG** | | | | | | | | | | | | | | | | | |
| Sr Proj | F12 | Assignment | All | | | Sr Proj | F12 | Assignment | Peters | | | Sr Proj | F12 | Assignment | Bridge | | |
| Prof Rating | S12 | Program fac | Stuart | | | Prof Rating | S12 | Program fac | Peters | | | Prof Rating | S12 | Program fac | Bridge | | |
| Sr Survey | S13 | Online survey | Stuart | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| **Diversity and global issues (ETAC j); Impact of engineering solutions on global/economic/environmental/social (EAC h)** | | | | | | | | | | | | | | | | | |
| **ME** | | | | | | | | | | | | | | | | | |
| Sr Proj | W13 | Peak Oil Ppr | All | | | | | | | | | | | | | | |
| Sr Survey | S13 | Online survey | Sloan | | | | | | | | | | | | | | |
| **MET** | | | | | | | | | | | | | | | | | |
| Sr Proj | F12 | Diversity Ppr | All | | | Sr Proj | F12 | Diversity Ppr | Peters | | | Sr Proj | F12 | Diversity Ppr | Bridge | | |
| Sr Proj | W13 | Peak Oil Ppr | All | | | Sr Proj | W13 | Peak Oil Ppr | Peters | | | Sr Proj | W13 | Peak Oil Ppr | Bridge | | |
| Sr Survey | S13 | Online survey | Culler | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| **MFG** | | | | | | | | | | | | | | | | | |
| Sr Proj | F12 | Diversity Ppr | All | | | Sr Proj | F12 | Diversity Ppr | Peters | | | Sr Proj | F12 | Diversity Ppr | Bridge | | |
| Sr Proj | W13 | Peak Oil Ppr | All | | | Sr Proj | W13 | Peak Oil Ppr | Peters | | | Sr Proj | W13 | Peak Oil Ppr | Bridge | | |
| Sr Survey | S13 | Online survey | Stuart | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| ANTH 452 | W13 | paper | Stuart? | | | | | | | | | | | | | | |
| **Commitment to quality, timeliness, and continuous improvement (ETAC k)** | | | | | | | | | | | | | | | | | |
| **MET** | | | | | | | | | | | | | | | | | |
| Sr Survey | S13 | Online survey | Culler | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| Prof rating | S13 | Faculty rating | Culler | | | Prof rating | S13 | Faculty rating | Peters | | | Prof rating | S13 | Faculty rating | Bridge | | |
| **MFG** | | | | | | | | | | | | | | | | | |
| Sr Survey | S13 | Online survey | Stuart | | | Sr Survey | S13 | Online survey | Peters | | | Sr Survey | S13 | Online survey | Bridge | | |
| Prof rating | S13 | Faculty rating | Stuart | | | Prof rating | S13 | Faculty rating | Peters | | | Prof rating | S13 | Faculty rating | Bridge | | |
| **Program Specific Outcomes** | | | | | | | | | | | | | | | | | |
| None | | | | | | | | | | | | | | | | | |
| **PEO Surveys** | | | | | | | | | | | | | | | | | |
| All | F12 | | | | | | | | | | | | | | | | |
| **2011-12 Closing the Loop** | | | | | | | | | | | | | | | | | |

## Rubrics for SLO's used in this year's assessment

### SLO e. An ability to function effectively on teams

The performance criteria for this learning outcome are:

1. Identify and achieve goal/purpose.
2. Assume roles and responsibilities as appropriate.
3. Interact appropriately with team/group members.
4. Recognize and help reconcile differences among team/group members.
5. Share appropriately in work of team/group.
6. Develop strategies for effective action.

### SLO i: An ability to understand professional, ethical and social responsibilities.

**OIT Ethics Rubric**

| Performance Criteria | Limited or No Proficiency (1) | Some Proficiency (2) | Proficiency (3) | High Proficiency (4) | Score |
|---|---|---|---|---|---|
| **Demonstrates knowledge of the professional code of ethics** | Identifies provisions in the professional code of ethics, but is unable to demonstrate importance or relevance to the profession. | Describes the importance of provisions, but some examples do not apply or fail to illustrate importance of the specified provision. | Describes the importance of provisions in the professional code of ethics. Examples are applicable to the specified provisions and illustrate importance. | Describes in detail the importance of provisions in the professional code of ethics and relevance to the profession. Examples are applicable to the specified provisions and illustrate importance. | |
| **Using code of ethics, describes ethical issue(s)** | Has a vague idea of what the issue is and is uncertain how the code of ethics applies. | Describes the issue(s) using concepts from code of ethics, but important elements may be missing or misunderstood. | Describes the issue(s) using basic concepts from code of ethics. | Describes the issue(s) in detail, demonstrating full understanding of relevant code of ethics provisions and how they relate to the issue(s). | |
| **Describes parties involved and discusses their points of view** | Is unsure who should be involved in the issue and/or does not reflect on their viewpoints. | Describes some of the parties and their viewpoints, but important elements are missing or misunderstood. | Describes who should be involved in the issue(s) and discusses the viewpoints of the parties at a basic level. | Describes who should be involved in the issue(s) and thoroughly discusses their viewpoints. | |
| **Describes and analyzes possible/ alternative approaches** | Is unable to describe or analyze alternatives or consider the effect on parties involved. | Describes and analyzes only one alternative and its effect on parties involved, but important elements are missing or misunderstood. | Describes and analyzes at least two alternatives and their effects on parties involved. | Describes and analyzes a number of alternative approaches and thoroughly considers the interests and concerns of all parties involved. | |
| **Chooses an approach and explains the benefits and risks** | Has difficulty choosing an approach or stating benefits and risks. | Chooses an approach and explains benefits and risks, but important elements are missing or misunderstood. | Chooses an approach and explains basic benefits and risks. | Chooses an approach and thoughtfully and thoroughly explains benefits and risks. | |

OIT Assessment Commission, 4/09/12

**SLO j: A respect for diversity and a knowledge of contemporary professional, societal and global issues.**

| Performance Criteria | (1) Limited or No Proficiency | (2) Some Proficiency | (3) Proficiency | (4) High Proficiency | Score |
|---|---|---|---|---|---|
| 1. Social customs of a foreign country | Demonstrates minimal to no understanding of cultural rules important to another culture (e.g., verbal/non-verbal, physical, history, values, politics, economy, communication, beliefs, practices). Does not recognize own cultural rules and biases. | Demonstrates partial understanding of cultural rules important to another culture (e.g., verbal/non-verbal, physical, history, values, politics, economy, communication, beliefs, practices). Demonstrates partial insight into own cultural rules and biases. | Demonstrates adequate understanding of cultural rules important to another culture (e.g., verbal/non-verbal, physical, history, values, politics, economy, communication, beliefs, practices). Demonstrates adequate insight into own cultural rules and biases. | Demonstrates sophisticated understanding of cultural rules important to another culture (e.g., verbal/non-verbal, physical, history, values, politics, economy, communication, beliefs, practices). Demonstrates nuanced insight into own cultural rules and biases. | |
| 2. Business etiquette of a foreign country. | Demonstrates minimal to no understanding of key differences in conducting business in a foreign country (greetings, appointments, relationships, attire, communication, time factors, resolving problems, meetings, formal/informal behavior, common errors). | Demonstrates partial understanding of key differences in conducting business in a foreign country (greetings, appointments, relationships, attire, communication, time factors, resolving problems, meetings, formal/informal behavior, common errors). | Demonstrates adequate understanding of key differences in conducting business in a foreign country (greetings, appointments, relationships, attire, communication, time factors, resolving problems, meetings, formal/informal behavior, common errors). | Demonstrates sophisticated understanding of key differences in conducting business in a foreign country (greetings, appointments, relationships, attire, communication, time factors, resolving problems, meetings, formal/informal behavior, common errors). | |
| 3. Engineering production issues of a foreign country. | Demonstrates minimal to no knowledge of production issues in a foreign country (e.g. quality control, technical language, product specifications, communication with vendors, contracts, labor pool, training, materials). | Demonstrates partial knowledge of production issues in a foreign country (e.g. quality control, technical language, product specifications, communication with vendors, contracts, labor pool, training, materials). | Demonstrates adequate knowledge of production issues in a foreign country (e.g. quality control, technical language, product specifications, communication with vendors, contracts, labor pool, training, materials). | Demonstrates advanced knowledge of production issues in a foreign country (e.g. quality control, technical language, product specifications, communication with vendors, contracts, labor pool, training, materials). | |

**SLO j: A respect for diversity and a knowledge of contemporary professional, societal and global issues.**

| Performance Criteria | Limited or No Proficiency (1) | Some Proficiency (2) | Proficiency (3) | High Proficiency (4) | Score |
|---|---|---|---|---|---|
| **Understand global impact of engineering decisions** | Does not understand that engineering solutions have a global impact. | Realizes that engineering solutions have a global impact but has difficulty giving examples. | Understands engineering decisions have a global impact and can explain several examples. | Understands engineering decisions have a global impact, can analyze examples, and can reflect on impact of proposed engineering solutions. | |
| **Understand macro-economic impact of engineering solutions** | Has little or no understanding of macro-economics. | Has little understanding of macro-economics and the effects of engineering solutions. Can not give examples of such impacts. | Has some understanding of macro-economics and the impacts on it from engineering solutions. Can give examples. | Has an understanding of macro-economics and the impact of engineering solution on it. Can explain examples and reflect on the impact new solutions may have. | |
| **Understand environmental and social impact of engineering decisions** | Does not believe that engineering decisions have a social or environmental impact. | Believes engineering solutions have a social and/or environmental impact but can't relate this to a particular situation. | Understands engineering decisions have social and/or environmental impacts. Can describe examples. | Understands engineering decisions have social and/or environmental impacts. Can relate this knowledge to a current situation. | |

**Outcome k: A commitment to quality, timeliness, and continuous improvement.** The faculty assessed this outcome using the following performance criteria:

1. Demonstrates responsibility for quality in personal work.
2. Meets deadlines and follows personal schedules.
3. Reevaluates work/designs with the aim to improve