ABET TAC CIP Report for the Academic Year 20010– 2011

Mechanical Engineering Technology (MET) Program

I. Introduction

This document reports the findings and proposed changes resulting from analysis of data gathered during the 2010-2011 academic year for the Mechanical Engineering Technology (MET) Program. Section II lists the overall Program Objectives and Outcomes followed by analysis and proposed changes in a course by course format. Section III summarizes the assessment of Life Long Learning. Section IV presents an overall Enrollment Assessment. Section V summarizes the results of the Graduate Exit Surveys. Section VI summarizes the evaluation by the Faculty of the Senior Capstone Student Presentations and their Peer Reviews. Section VII analyzes results from MET students taking the national Fundamental of Engineering (FE/EIT) exam. Section VIII presents a summary of formal surveys submitted from the MET Internship program. Section IX utilizes all the assessment data to analyze the program as a whole, and proposes changes to it. Section X provides an overall summary of the program assessment.

II. MET Program Objectives, Curricula Analysis and Proposed Changes

The MET Program Objectives are repeated below. After each Program Objective the associated Outcomes are listed with their associated mapping to ABET TAC Criterion 3.

Objective 1: To have the students demonstrate their ability to understand the technical content of their field.

Outcome 1.1: To have the students demonstrate their ability to understand technical and industrial terminology and processes. (ABET TAC Criterion 3*a*, *b*, & *f*)
Outcome 1.2: To have the students demonstrate their ability to understand industrial concepts. (ABET TAC Criterion 3*b* & *f*)

Objective 2: To have the students demonstrate their ability to use applied technology.

Outcome 2.1: To have the students apply learned knowledge to practical problems and adapt to emerging applications of mathematics, science, engineering and technology. (ABET TAC Criterion 3*a*, *b*, & *f*)
Outcome 2.2: To have the students use typical tools, hardware, and software in an efficient manner. (ABET TAC Criterion 3*a*, *b*, & *f*)
Outcome 2.3: To have the students conduct, analyze and interpret experiments and apply experimental results to improve processes. (ABET TAC Criterion 3*c*)

Objective 3: To have the students apply and improve their technical thinking.

> **Outcome 3.1**: The students are able to evaluate a problem and bring general design strategies to bear on the problem with a commitment to quality, timeliness, and continuous improvement. (ABET TAC Criterion 3*d*, *f*, & *k*)
> **Outcome 3.2**: The students are able to plan and coordinate a project and manage systems. (ABET TAC Criterion 3*d*, *f*, & *k*)

Objective 4: To have the students demonstrate their professional, societal, individual, and workgroup skills.

> **Outcome 4.1**: To have the students demonstrate their ability to function effectively on teams. (ABET TAC Criterion 3*e*)
> **Outcome 4.2**: To have the students understand professional, ethical and social responsibilities; To have the students demonstrate respect for diversity and a knowledge of contemporary professional, societal and global issues. (ABET TAC Criterion 3*i* & *j*)
> **Outcome 4.3**: To have the students recognize the need for, and demonstrate an ability to engage in lifelong learning. (ABET TAC Criterion 3*h*)

Objective 5: To have the students demonstrate their ability to communicate effectively.

> **Outcome 5.1**: The students are able to write clearly and concisely to a variety of audiences. (ABET TAC Criterion 3*g*)
> **Outcome 5.2**: The students are able to communicate verbally, give presentations, demonstrate skills related to persuasion, listening and the consideration of other points of view, appropriate for industry. (ABET TAC Criterion 3*g*)

Objective 6: To fulfill the need for engineering technology in the Northwest Region.

> **Outcome 6.1**: To have faculty and students involved with Tech Club, regional companies, and professional societies such as ASME, SME, ASHRAE and ASM. (ABET TAC Criterion 3*h*)
> **Outcome 6.2:** To have an Industrial Advisory Board that is actively involved with the program.

ABET TAC Criterion 3 *a* through *k* Outcomes
a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;
b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;
c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;
d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;
e. an ability to function effectively as a member or leader on a technical team;
f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;
g. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;
h. an understanding of the need for and an ability to engage in self-directed continuing professional development;
i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;
j. a knowledge of the impact of engineering technology solutions in a societal and global context; and
k. a commitment to quality, timeliness, and continuous improvement.

The following course-by-course review presents data derived from in-course surveys. The raw data is tabulated in a standardized spreadsheet in accordance with formulas approved by the Continuous Improvement Plan (CIP). For details, reference the program CIP.

ENGR 110: Engineering Graphics

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.5	3.6	N/A	3.5	N/A	N/A	3.5	N/A	N/A	N/A	3.5

This year's scores for ENGR 110 were almost identical to last year. The course content remained almost identical to last year. The course objectives were simplified and re-mapped to current ABET TAC criteria. Textbook and course content remain essentially unchanged. All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Recommendation: Continue current methods and coverage and monitor for any significant changes.

ENGR 207: Survey of Electricity

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.4	3.4	0.0	3.4	3.4	3.4	3.6	0.0	3.3	3.3	3.4

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. This is the second time that this course was offered. Course lectures, Laboratory Experiments, and Homework Assignments were all revised from last year allowing for an improved approach for presenting the material as well as obtaining feedback from the students. Although the results indicate that a vast majority of the students understand the material while meeting the objectives and outcomes additional work can be done to improve the course. A new study guide for the tests will be utilized in order to improve the lowest evaluation method even though the average test scores were in the mid to upper 70s which is acceptable for most courses.

ENGR 217: 3D Parametric Modeling

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.6	3.6	N/A	3.4	N/A	3.3	N/A	N/A	N/A	N/A	N/A

This course underwent some revision for this year. First of all the course changed its prefix and number. The course was previously called TECH 317: Computer Aided Drafting (SolidWorks). The course has been renumbered as a 200-level course and the name has been changed to emphasize that 3D Parametric Modeling is the topic of the course. Objectives for the course were re-worked consistent with the overall change to the course and how it fits in the program. Changes to the course objectives also aligned them with current ABET TAC criteria. The course still emphasizes the creation of 3D parametric models, creating assemblies, creating dimensioned multiview drawings, and allows students to create a project that can be printed out on the Rapid Prototyper. All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Recommendation: Continue current methods and coverage and monitor for any significant changes.

ENGR 353: Industrial Materials

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.5	3.5	3.4	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. No changes are recommended for this course for the 2011-2012 year.

ENGR 380: Thermodynamics

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
2.6	2.5	2.7	N/A	2.7	N/A	2.8	1.2	1.2	1.2	N/A

The objectives/Program outcomes/ABET criteria related to the technical aspects of thermodynamics have been met with room for improvement, but those associated with how the Engineering Profession is related to thermodynamics were not met.

During his first year of teaching this course, Dr. Weiser emphasized the fundamental/technical aspects of thermodynamics with light coverage of the historical development and professional aspects. For the next year a different text has been selected that includes more coverage of these issues and some of the homework and testing has been based upon the type of questions asked on the Fundamentals of Engineering Exam. This text also includes more calculus than the previous text which better meets the needs of Mechanical Engineering students, but is not at such a high level to cause difficulty for the Mechanical Engineering Technology students.

ENGR 382: Fluid Mechanics

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.8	3.7	3.5	3.5	3.5	3.5	3.5	N/A	N/A	N/A	N/A

This course underwent some revision for this year. First of all the course changed its prefix as part of the changes made with the start of the new Mechanical Engineering program. The course was previously called TECH 382. Objectives for the course were simplified and aligned with current ABET TAC criteria. A wind tunnel laboratory experience was added to the course. It is hoped to expand this lab once parts of the equipment that are malfunctioning can be repaired. Calculus concepts were added to the course this year through instructor notes. All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Recommendation: A new textbook will be selected for next year. The current textbook is not calculus based and coverage of calculus concepts strictly through the addition of instructor notes clearly indicated that this information would be better provided in the course text. With the changes made to this course it should be carefully monitored for any significant changes.

ENGR 384: Industrial Energy Management & Utilizations

ABET TAC Criteria (scale 0-4)

a	b	c	d	e	f	g	h	i	j	k
3.0	3.1	n/a	n/a	n/a	3.0	3.2	3.2	n/a	n/a	3.2

All learning objectives /Programs outcomes/ ABET criteria have been met in a satisfactory way (at least >=3.0)
Evaluation of the course indicate that the students understand the objectives of the course with the majority of the responses in the good to excellent range for both the course as well the laboratory experiments.

ENGR 385 : Robotics and Automated Systems

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
2.7	2.7	n/a	3.1	3.6	2.8	3.1	n/a	n/a	n/a	3.6

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 2.0)

Evaluations of the course indicate that the students understand the objectives of the course with the average of 3.07 in the good range. Responses to the laboratory experiments were excellent indicating a firm grasp of the technological issues. The instructor will put more emphasis on the calculations used in the theory portion of the class.

ENGR 405: Machine Design

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.7	3.7	N/A	3.7	3.7	3.7	3.7	N/A	N/A	N/A	3.7

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. No changes are recommended for this course

for the 2011-2012 year. However, MET students will take TECH 415 instead of ENGR 405 effective from 2013-14 academic year.

ENGR 407: HVAC

ABET TAC Criteria 3

a	b	c	d	e	f	g	h	i	j	k
3.0	3.1	N/A	3.0	N/A	N/A	3.0	N/A	N/A	N/A	0.0

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)
Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range.

ENGR 412: Fundamentals of Engineering

This class underwent revision this year as part of changes made for the creation of the new Mechanical Engineering program. The course prefix changed from TECH to ENGR. Also the course title changed from Engineering Principles to Fundamentals of Engineering to better reflect the purpose of the course to introduce students to the engineering licensing process and prepare them to take the Fundamentals of Engineering examination in the Spring. The online sample FE exam introduced into the course last year was utilized again this year. It is difficult to draw too many significant conclusions from just two years of data. Results were consistent with those from last year in that most students scored below 50% in most areas. It appears that this is a motivating factor in showing students where they are weak as our FE Exam pass rates remain consistent with the national average. Industrial support for the FE Exam scholarship program that began last year continued this year. 11 students that took the FE exam had the cost of the exam reimbursed by donations from local industrial partners. Students are currently not required to register for the FE Exam in order to pass this class or to complete their graduation requirements for the degree. Consideration will continue to be given as to whether application for the FE Exam should be made a mandatory requirement for the program.

Recommendation: It is obvious that students need more practice to prepare them for the FE exam. It is recommended to add homework problems to the course to require them to review the lecture topic prior to class. This course was assessed this year utilizing the results from the course practice exam. Next year the course will also include a student assessment of the course objectives.

ENGR 452: Engineering Economics

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.7	3.7	N/A	3.7	3.7	3.7	3.7	N/A	3.7	3.7	3.7

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)
Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. No changes are recommended for this course for the 2011-2012 year.

ENGR 492: Finite Element Analysis

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.5	3.5	N/A	3.6	3.6	3.5	3.5	N/A	N/A	N/A	3.5

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)
Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. No changes are recommended for this course for the 2011-2012 year.

ENGR 493: Senior Seminar

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.9	3.6	3.6	N/A

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)
Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. No changes are recommended for this course for the 2011-2012 year.

TECH 340: Statics

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.6	3.6	N/A	3.6	3.6	3.6	3.6	N/A	N/A	N/A	3.6

All learning objectives/Program outcomes/ABET criteria met in an excellent manner.

Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. It seems that students with Construction Management and Design options need more time and help in Statics. Therefore, the total credit-hours of TECH 340 class has been changed from 4 credits to 5 credits effective from 2012-13 academic year.

TECH 341: Strength of Materials

ABET TAC Criteria(scale 0-4):

a	b	c	d	e	f	g	h	I	j	k
3.0	3.0	N/A	N/A	N/A	3.0	N/A	N/A	N/A	N/A	3.0

All learning objectives /Programs outcomes/ ABET criteria have been met in a satisfactory way (at least >=2.5)

Evaluation of the course indicate that the students understand the objectives of the course with the majority of the responses in the good to excellent range for the course.

TECH 342: Dynamics

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.6	3.6	N/A	3.6	3.5	3.5	3.6	N/A	N/A	N/A	3.6

All learning objectives/Program outcomes/ABET criteria met in an excellent manner.

Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. No changes are recommended for this course for the 2011-2012 year.

TECH 393: Technology in World Civilization

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
N/A	N/A	N/A	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

All learning objectives/Program outcomes/ABET criteria have been met in a satisfactory way (at least medium level >= 3.0)

Evaluations of the course indicate that the students understand the objectives of the course with the vast majority in the good and excellent range. Course lectures, essay topics, and discussion materials are updated for each quarter's course allowing for an improved approach for presenting the material as well as obtaining feedback from the students. Although the results indicate that a vast majority of the students understand the material while meeting the objectives and outcomes additional work can be done to improve the course. A new study guide for the tests will be utilized in order to improve the lowest evaluation method even though the average test scores were in the mid-80s which is highly acceptable for most courses. Students need additional engineering ethics training in order to do better on the Ethics Exam. However, their grades on the Ethics Essay averaged in the 90s%, which is acceptable.

TECH 403: Computer Aided Design & Project Management

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k	
2.5	2.7	N/A	2.7	N/A	2.7	2.4	N/A	N/A	N/A	2.7	Fall 2010
3.1	3.1	N/A	3.1	N/A	3.1	3.3	N/A	N/A	N/A	3.1	Spring 2011

All learning objectives/Program outcomes/ABET criteria were met during the Fall term and improved upon during the Spring term.

There was relatively good agreement between the student and instructor evaluation of how well the learning objectives were met during both terms. This was the first year that Dr. Weiser taught the course and the feedback from the Fall evaluations was used to improve the course during the Spring term. This course is taught to students with a wide range of backgrounds so work is ongoing to develop teaching materials and assignments that are relevant to them since this course material is best when learned in context.

TECH 462: Industrial Safety Engineering

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.0	N/A	N/A	N/A	N/A	N/A	2.8	2.5	2.8	3.0	2.5

All learning objectives/Program outcomes/ABET criteria met with room for improvement.

There was relatively good agreement between the student and instructor evaluation of how well the learning objectives were met. This was the first year that Dr. Weiser taught the course and based upon the written feedback there is need to better define the projects and test questions . Otherwise, no changes are planned.

TECH 490: Senior Capstone Design

ABET TAC Criteria (scale 0-4):

a	b	c	d	e	f	g	h	i	j	k
3.0	2.8	2.8	2.9	3.1	2.8	3.1	N/A	N/A	3.3	3.3

All learning objectives/Program outcomes/ABET criteria have been adequately met.

This course is in transition from a Production Laboratory that met the needs of Applied Tech – Manufacturing and MET students to a more Research, Development, Prototype, and Test focus better suited to the ME/MET students. During the Spring term the students were given wide latitude in their projects which some embraced, but others found to be outside their comfort zone based upon the previous classroom experience. The suggested changes going forward are to

develop methods of fostering teamwork and to revise the evaluation form to better address the new format of the course by removing some of the questions regarding company formation

III. Summary of Life Long Learning

The lifelong learning assignments and learning module was included in the Senior Capstone Course (ENGR 490). Exit surveys from the students indicate that they are aware of the importance of lifelong learning. Further indications of a shift in the student's appreciation of lifelong learning is evident in the students' participation in the university wide Undergraduate Research Symposium. The Department has also established, with the help of the local Society of Manufacturing Engineers, a paper contest with one of the other local engineering universities. The Department is always trying to increase its peer review paper publications by faculty showing by example that lifelong learning is an integral part of a professional career. A Total of six peer reviewed papers were published and presented by faculty members this year at the following; Annual Convention of the American Society of Engineering Education (ASEE), Portland International Center for Management of Engineering and Technology (PICMET), and American Society of Mechanical Engineering International Mechanical Engineering Congress and Exposition (ASME IMECE). This year we will bring in industrial partners to talk to the students about how important lifelong learning is to have a successful career. The faculty will again this year actively foster student participation in the Undergraduate Research Symposium. The faculty strongly believes we need to improve the enrollment of students in technical organizations such as the Institute of Electronic and Electrical Engineers (IEEE), Society of Manufacturing Engineering (SME), and the American Society of Mechanical Engineers (ASME). A baseline will be set using the 2008-9 year and we will look to improve active membership by 20%. The faculty is now actively involved in the local ASME chapter where three faculty members are assigned the vice chair, secretary and student liaisons positions. The student chapter of SME was reformed during the 2010-11 academic year and a faculty member became chair of the senior chapter for 2011.

IV. Enrollment Assessment

Looking at the program enrollments, the program lost some enrollment from the past years with the shift of students enrolling in the new BSME program. Enrollment in spring quarter 2011 was 110 declared students. We predict that over the next year enrollment may still drop as more incoming students try to enter the BSME program. It is anticipated that we will see the enrollments level off and then rise some as students switch major form the BSME to BSMET as they hit the higher level calculus courses. Total enrollment between the two degree programs is expected to continue to rise.

V. Summary of Graduate Exit Surveys

A survey containing twelve questions was given to the students enrolled in the Senior Capstone Course (TECH 490). The questions asked students to rate their educational experience at Eastern

Washington University and the Mechanical Engineering Technology Degree Program. The overall results were good. The average was 3.21 on a scale of 0 to 4 (with Very Dissatisfied = 0 to Very Satisfied = 4) which is a slight improvement compared to last year. There were no outlying points that indicated a serious problem in the satisfaction with the program in general. The survey also contains a series of open ended questions to obtain further data on the program. From these comments the Department has been able to determine the following. The students liked the hands on approach of the course work with laboratory experiences to reinforce the theory. The Department will continue to utilize extensive lab experience based on this and the embedded course assessments.

VI. Summary of Capstone Faculty Evaluation of Student Presentations & Peer Reviews

The faculty of the E&D Department wants to improve the oral presentation aspect of the projects and to this end the department will video tape the presentations. These video tapes will be shown to the students enrolled in the Senior Capstone Course (TECH 490) next year. It is hoped this new method will improve the presentation skills of the students. The Department's faculty has also reviewed the senior capstone peer reviews and is satisfied with the evaluations as a whole. There is still room for improvement in helping students motivate other members of the team. The Department will try to develop methods to help in this area. This may include direct talks with students that the student teams do not feel are doing their share of the work and advising them that the grade they receive for the course will suffer if their performance does not improve. During the spring session we instituted a semiformal design reviews where the students had to present their current design to the class for feedback.

VII. Assessment of FE Exams

The results of the students who took the Fundamentals of Engineering (FE) exam cannot be adequately assessed as the number taking the exam was low this year. Eight students took the exam in April and 5 received a passing score for a pass rate of 63%. This rate is slightly above the national average but, as mentioned previously, the sample size is small so it is difficult to draw too many accurate conclusions. Anecdotally, this is consistent with results from last year that were approximately equal to the national average for students passing the exam. Currently, taking the exam is not a requirement to complete the degree program but all students are encouraged to do so and each student must take a required course that reviews the engineering licensing process and helps prepare them for the exam. Discussion is periodically held as to whether this should be changed and applying for the exam should be mandatory. Results for this past year were consistent with previous years in that slightly less than half of the eligible students actually applied and took the exam before graduation. To help motivate students to take the exam we were able to continue the FE Exam scholarship program that was instituted last year. Donations from members of our Industrial Advisory Committee are awarded to the top students to reimburse them for the cost of the exam. Awards are given only to students who actually take the exam and the awards are given based on the scores students receive on the FE Practice Exam administered as part of the ENGR 412 class. This year we were able to award 11 of these

scholarships to our students. We anticipate that we will continue the online practice exam and the scholarship program for next year.

VIII. Summary of Internship Assessments

The Employer evaluations of the interns both mid-term and final were reviewed by the faculty. The employers stated that the interns are indeed able to perform the tasks and projects assigned to them as expected. Miscellaneous content areas were discussed but no deficiencies were noted in student preparation and knowledge.

The review of the student intern reports on how they felt they met the learning objectives of their internship indicated an overwhelming positive experience. The reading of student daily journals agrees with this assessment.

There are no actions indicated from this assessment source at this time. The department will continue to monitor the success of the interns during the next school year.

IX. Program Analysis and Proposed Changes

The ABET TAC a-k Criterion are listed in the table presented below followed by an overall summary of how these criterion were met in the Mechanical Engineering Technology (MET) Program.

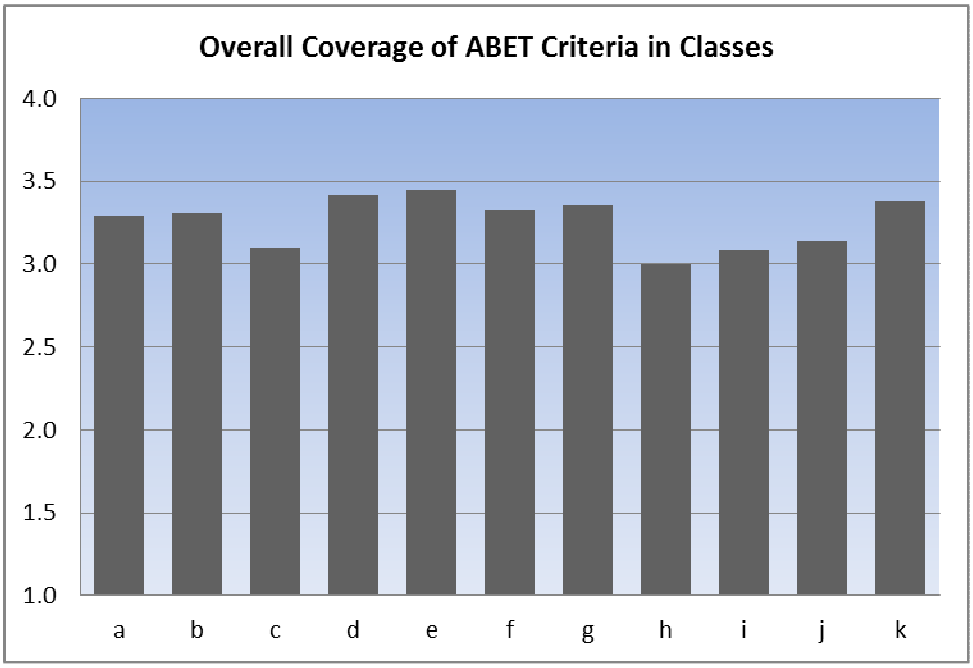
ABET TAC a-k Criterion
a. an appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines,
b. an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology,
c. an ability to conduct, analyze, and interpret experiments and apply 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. respect for diversity and a knowledge of contemporary professional, societal, and global issues,
k. a commitment to quality, timeliness and continuous improvement.

The overall averages of performance versus ABET TAC Criteria a-k for the Mechanical Engineering Technology (MET) Program for the academic year 2010 – 2011 are presented below.

ABET TAC Criteria Averages (scale 0-4) for the Academic year 20010 - 2011:

a	b	c	d	e	f	g	h	i	j	k
3.3	3.3	3.1	3.4	3.5	3.3	3.4	3.0	3.1	3.1	3.4

All learning objectives/Program outcomes/ABET criteria on average for the academic year 20010-2011 have been met in a satisfactory way (at least medium level >= 3.0)
This data is also presented in a graphical as follows.



Through the analysis of all data available (exit surveys, course assessment, teaching peer reviews, student feedback through advising, and faculty review), the following areas were identified as requiring improvement:

1. The credit hours have been increased for TECH 340 from 4 to 5 hrs.
2. Use a calculus based text in Thermodynamics (ENGR 380) and incorporate some questions based upon the FE Exam into the class.
3. Encourage more students to take the FE exam

Based on these findings, the following overall program changes are proposed:

1. Continue to try to start a tutoring program with upper classman students on a fee basis.
2. Use a calculus based text in Thermodynamics (ENGR 380) and in corporate some questions based upon the FE Exam into the class.

3. Encourage student participation in the EWU Undergraduate Research Symposium.
4. Promote student participation in professional societies and student clubs.
5. Continue to encourage students to take the FE exam.
6. Continue to develop the R&D focus of Senior Capstone (TECH 490) and pull in projects from local companies and organizations.
7. Encourage students to take Laboratory Analysis & Reports (ENGR 381) rather than Introduction to Technical Communication (ENGL 205) to help improve their laboratory analysis and writing skills.

X. Summary

This report summarizes the findings from the Continuous Improvement Program instituted and annually performed for the Mechanical Engineering Technology (MET) Program. As indicated in each of the preceding sections many good things are currently being done.