WSU Five-Year Program Review
Self-Study

Cover Page

Department/Program: Engineering Technology/Manufacturing Engineering Technology

Semester Submitted: Fall 2014

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A. Brief Introductory Statement

The Manufacturing Engineering Technology (MFET) program was implemented in the 1962-63 academic year as a direct response to requests from local industries and has been ABET accredited since 1972. An Associate of Applied Science degree was added to the four year degree in 1998.

Since 2010, several significant changes have occurred that enhance our capability to serve students. In 2011, an emphasis in Plastics and Composites was added to the MFET degree and the traditional MFET degree was given the emphasis name of Production Operations & Controls. With the Welding emphasis added in 2004, students now have 3 different options or emphases in their pursuit of a Manufacturing Engineering Technology degree. Shortly after the Electronics Engineering Technology program was moved into the department, the department name was also changed from Manufacturing & Mechanical Engineering Technology to the more appropriate and inclusive name of Engineering Technology.

The MFET program has continued to strengthen the use of the Senior Capstone Project as an assessment tool. During the last academic year, the program was also enhanced with the acquisition of four new CNC Haas Lathes one CNC Haas Mill, a Mach II Flowwater-jet cutter, a Haas GR510 CNC Router for the plastic/composite laboratory, and an upgrade to our Stratasys Dimension 3D printer.

B. Mission Statement

**College of Applied Science and Technology**

The vision of the College of Applied Science and Technology (COAST) is to be Utah's leader in technology and technology-related programs through service to our students and the businesses and industries in our region. Our mission is to serve the citizens of northern Utah and the state of Utah by:

- Preparing students for employment upon graduation and ensuring that they are productive, accountable and responsible individuals able to function effectively in today's workplace.

- Engaging in scholarly activities that expand the technological education our students receive and provide a service to business and industry.
- Utilizing the college's resources and faculty expertise to benefit students, business, industry, education, government and society in general.

**Manufacturing Engineering Technology (MFET) Program Mission Statement**

The MFET Program at Weber State University will be a growing, nationally recognized, ABET accredited program that affords faculty and students the opportunities for intellectual and personal growth, while enabling economic growth in Utah. We will prepare students with a broad technical foundation along with the communication and interpersonal skills which will enable them to demonstrate professional competence within the discipline and serve the needs of industry.

C. Curriculum

Curriculum Map

- **Relationship of Courses in the Curriculum to the Program Outcomes**

Curriculum Map

| **I = Introduced**<br>**R = Reinforced**<br>**E = Emphasized**<br>**A = Assessed**<br><br>Core Courses in the Program | Department/Program Learning Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Learning Outcome 1 | Learning Outcome 2 | Learning Outcome 3 | Learning Outcome 4 | Learning Outcome 5 | Learning Outcome 6 | Learning Outcome 7 | Learning Outcome 8 | Learning Outcome 9 | Learning Outcome 10 | Learning Outcome 11 |
| MFET 1150 Pre-Professional Seminar | I | I | | | | I | I | I | I | I | I |
| MFET 1210 Machining Principles | I | I | | | | | I | | | | |
| DET 1010 Intro to Eng & Technical Des | I | | | | | | | | | | |
| DET 1160 GD&T using 3D CAD | | I | | I | | | | | | | |
| MFET 2150 Metal Form, Cast & Weld/Lab [C] | R | I | | | I | | I | | | | |
| DET 2460 Product Design Fund 3D CAD | R | | | R | | R | | | | | |
| MFET 2300 Statics & Strength of Materials | | R | | | E | | | | | | |
| MFET 2410 Quality Concepts & Stats Apps | R | R | | | | | | | | | |
| MFET 2440/L CNC in Manufacturing/Lab | | R | | R | | R | | | | | |
| EET 1850 Industrial Electronics | R | | | | | | | | | | |
| MFET 3340/L Applied Fluid Power/Lab | | I | | | | | | | | | |

| **I = Introduced**<br>**R = Reinforced**<br>**E = Emphasized**<br>**A = Assessed**<br><br>Core Courses in the Program | Department/Program Learning Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Learning Outcome 1 | Learning Outcome 2 | Learning Outcome 3 | Learning Outcome 4 | Learning Outcome 5 | Learning Outcome 6 | Learning Outcome 7 | Learning Outcome 8 | Learning Outcome 9 | Learning Outcome 10 | Learning Outcome 11 |
| MFET 3350/L Plastics & Composite Mfg/Lab | | R | | | | R | | | | | |
| MFET 3810 Statistical Proc Control & Rel | I | R | | | | | R | | | | |
| DET 3100 Tool Design [C] | | R | | E | | R | | | | | |
| MFET 3400 Machine Design [C] | I | I | R | E | | | | | | | |
| MFET 3550 Manufacturing Supervision | R | | | | | | | | | | |
| MFET 3710/L Comp Aided Mfg & Rapid Proto | E | E | | | | | | | | | |
| MFET 3910 Six Sigma Methods and Tools | E | E,A | E,R | | | R | | | | | |
| MFET 3150 Engineering Tech Materials | I | | | | | | | | | | |
| MFET 4580/L Process Automation/Lab | | | I | R | | E | | | | | |
| MFET 4590 Prod Plan & Control | | R | | E | | E | | | | | |
| MFET 4610 Senior Project Plan & Estimating | I,A | I,A | A | A | E,A | R,A | E,A | A | A | A | A |
| MFET 4610L Senior Project Lab I | | | | | R | E | R | E | R | | E |
| MFET 4620L Senior Project Lab II | | | | | R | E | R | E | R | | E |
| MFET 4995 CMfgT Exam Review | A | A | A | A | A | A | A | A | A | A | A |
| | | | | | | | | | | | |
| Technical Electives | | | | | | | | | R | R | |
| | | | | | | | | | | | |
| MFET 2850 CAD/CAM for Plastic & Comp [P] | R | | | | | | | | | | |
| MFET 2860 Plastic/Comp Matl & Properties [P] | I | | | | | | | | | | |
| MFET 2870 Design of Plastic/Comp Prod [P] | R | | | E | | | | | | | |
| MFET 3870 Mold Design & Proc Strategies [P] | | | | R | | | | | | | |

| **I = Introduced**<br>**R = Reinforced**<br>**E = Emphasized**<br>**A = Assessed**<br><br>Core Courses in the Program | Department/Program Learning Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Learning Outcome 1 | Learning Outcome 2 | Learning Outcome 3 | Learning Outcome 4 | Learning Outcome 5 | Learning Outcome 6 | Learning Outcome 7 | Learning Outcome 8 | Learning Outcome 9 | Learning Outcome 10 | Learning Outcome 11 |
| MFET 3830 Reinforced Plastic/Adv Comp [P] | E | | | | | | E | | | | |
| MET 4650 Thermal Science [P] | E | | | | | | | | | | |
| | | | | | | | | | | | |
| MFET 2670/L GMA, FCA and GTA Weld/Lab [W] | E | | | | | | | | | | |
| MFET 3060 Codes, Weld Inspection & QA [W] | E | | | | | | | | | | |
| MFET 3630/L Welding Metallurgy/Lab II [W] | E | R | | | | | | | | | |
| MFET 3820 Nondestructive Testing [W] | E | | | | | | | | | | |
| MFET 4090 Welding Power Sources [W] | E | R | | | | | | | | | |
| MFET 4310 Corrosion & Corrosion Control [W] | E | | | | | | | | | | |
| | E | | | | | | | | | | |
| **Support Courses:** | | | | | | | | | | | |
| MATH 1080 | | | | | | I | | | | | |
| MATH 1210 | | | | | | R | | | | | |
| ENGL 1010 | | | | | | | I | | | | |
| ENGL 2010 | | | | | | | R | | | | |
| COMM 2110 | | | | | | | R | | | | |
| PHSX 2010 or 2210 | | | | | | E | | | | | |
| CHEM 1110 | | | I | | | | | | | | |
| ECON 1010 | I | | | | | | | | | | |
| Diversity Elective | | | | | | | | | R | R | |
| Humanities Elective | | | | | | | | | R | R | |

| **I = Introduced**<br>**R = Reinforced**<br>**E = Emphasized**<br>**A = Assessed**<br><br>Core Courses in the Program | Department/Program Learning Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Learning Outcome 1 | Learning Outcome 2 | Learning Outcome 3 | Learning Outcome 4 | Learning Outcome 5 | Learning Outcome 6 | Learning Outcome 7 | Learning Outcome 8 | Learning Outcome 9 | Learning Outcome 10 | Learning Outcome 11 |
| Comp. & Info Lit (NTM) | I | | | | | | | | | | |
| | | | | | | | | | | | |

Unique to Emphasis:

[C] Production Operations & Controls Emphasis
[P] Plastics & Composites Emphasis
[W] Welding Emphasis

Summary Information

The Manufacturing Engineering Technology degree with the three emphases places our graduates at a near 100% placement rate in high-paying, rewarding positions in industry throughout the country. Our graduates receive some of the highest paying salaries of any baccalaureate degrees from Weber State University.

D. Student Learning Outcomes and Assessment

Measureable Learning Outcomes

At the end of their study at WSU, students in this program will

1. Demonstrate appropriate mastery of knowledge, skills and modern tools in the discipline, including technologies of materials, manufacturing processes, tooling, automation, production operations, maintenance, quality, industrial organization and management, and statistics.

2. Apply current knowledge of technologies of materials, manufacturing processes, tooling, automation, production operations, maintenance, quality, industrial organization and management, and statistics to manufacturing engineering technology problems.

3. Conduct, analyze and interpret experiments and apply experimental results to improve processes.

4. Apply creativity to design of systems, components and processes.

5. Function effectively on teams.

6. Demonstrate the ability to identify, analyze and solve broadly defined engineering technology problems.

7. Communicate effectively in written, oral, and graphical forms.

8. Recognize the need for and possess the ability to pursue lifelong learning.

9. Understand professional, ethical and social responsibilities.

10. Respect diversity and recognize professional, societal and global issues.

11. Have a commitment to quality, timeliness and continuous improvement.

Summary Information (as needed)

Evidence of Learning: General Education Courses

Evidence of Learning: Courses within the Major

| Evidence of Learning: Courses within the Major | | | | | |
|---|---|---|---|---|---|
| Measureable Learning Outcome | Method of Measurement | Threshold for Evidence of Learning | Findings Linked to Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| 1. Demonstrate appropriate mastery of knowledge, skills and modern tools in the discipline, | 1. Course Exams | | | | |
| | 2. Surveys (Exit Interview w/student) | No survey question responses below 3 on a 1-5 scale | Survey is administered in MFET 4610 senior Project; Last semester assessment 4.0/5 | Students feel they are adequately prepared | Continue surveys |
| | 3. Senior Project Evaluations | No evaluations below 3 on a scale of 1-5 | Senior Project evaluations for last semester showed an average score of over 4. All were above 3. | | |
| | 4. Select student work | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 2. Apply current knowledge of technologies to Manufacturing engineering technology problems | 1. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 4.3/5 | Students feel they are adequately prepared | Continue surveys |

| Evidence of Learning: Courses within the Major | | | | | |
|---|---|---|---|---|---|
| Measureable Learning Outcome | Method of Measurement | Threshold for Evidence of Learning | Findings Linked to Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| 2. continued | 2. Course Exams | | | | |
| | 3. Senior Project Evaluations | | | | |
| | 4. Select student work | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 3. Conduct, analyze and interpret experiments and apply experimental results to improve processes. | 1. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 4.0/5 | Students feel they are adequately prepared | Continue surveys |
| | 2. Senior Project Evaluations | | | | |

| Evidence of Learning: Courses within the Major | | | | | |
|---|---|---|---|---|---|
| Measureable Learning Outcome | Method of Measurement | Threshold for Evidence of Learning | Findings Linked to Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| 3. continued | 3. Select student work | | | | |
| 4. Apply creativity to design of systems, components and processes. | 1. Senior Project Evaluations | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 3.9/5 | Students feel they are adequately prepared | Continue surveys |
| | 3. Select student work | | | | |
| 5. Function effectively on teams. | 1. Senior Project Evaluations | | | | |

| Evidence of Learning: Courses within the Major | | | | | |
|---|---|---|---|---|---|
| Measureable Learning Outcome | Method of Measurement | Threshold for Evidence of Learning | Findings Linked to Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| 5. continued | 2. Surveys (student) | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 3. Select student work | | | | |
| 6. Demonstrate the ability to identify, analyze and solve broadly defined engineering technology problems | 1. Senior Project Evaluations | | | | |
| | 2. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 3.9/5 | Students feel they are adequately prepared | Continue surveys |
| | 3. Select student work | | | | |
| 7. Communicate effectively in written, oral, and graphical forms. | 1. Senior Project Evaluations | | | | |

| Evidence of Learning: Courses within the Major | | | | | |
|---|---|---|---|---|---|
| Measureable Learning Outcome | Method of Measurement | Threshold for Evidence of Learning | Findings Linked to Outcomes | Interpretation of Findings | Action Plan/Use of Results |

| | | | | | |
|---|---|---|---|---|---|
| 7. continued | 2. Select student work | | | | |
| | 3. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 4.9/5 | Students feel they are adequately prepared | Continue surveys |
| 8. Recognize the need for and possess the ability to pursue lifelong learning. | 1. Senior Project Evaluations | | | | |
| | 2. Surveys (student) | | | | |
| 9. Understand professional, ethical and social responsibilities. | 1. Senior Project Evaluations | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 3.9/5 | Students feel they are adequately prepared | Continue surveys |
| Evidence of Learning: Courses within the Major | | | | | |
| Measureable Learning Outcome | Method of Measurement | Threshold for Evidence of Learning | Findings Linked to Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| 10. Respect diversity and recognize professional, societal and global issues. | 1. Senior Project Evaluations | | | | |
| | 2. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 4.9/5 | Students feel they are adequately prepared | Continue surveys |
| | 3. Select student work | | | | |
| 11. Have a commitment to quality, timeliness and continuous improvement. | 1. Senior Project Evaluations | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 2. Surveys (student) | | Survey is administered in MFET 4610 senior Project; Last semester assessment 4.8/5 | Students feel they are adequately prepared | Continue surveys |

| Evidence of Learning: General Education Courses | | | | | |
|---|---|---|---|---|---|
| Measurable Learning Outcome<br><br>Students will… | Method of Measurement<br><br>Direct and Indirect Measures* | Threshold for Evidence of Student Learning | Findings Linked to Learning Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| Learning Outcome 1.A: | Measure 1: (Ex. A set of 10 multiple choice questions from Exam 1) | Measure 1: (Ex. 85% of students will score 80% or better on 10 questions) | Measure 1: (Ex. 93% of students scored 80% or better on 10 questions) | Measure 1: (Ex. Students successfully demonstrated interpretation skills) | Measure 1: (Ex. No curricular or pedagogical changes needed at this time) |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: |
| Learning Outcome 2.A: | Measure 1: (Ex. Results of standardized test) | Measure 1: (Ex. 85% of students will score at or above the national average) | Measure 1: (Ex. 90% of students scored above national average) | Measure 1: (Ex. Students successfully demonstrated competence; lowest average score was in transfer of knowledge, where only 69% of questions were answered correctly | Measure 1: (Ex. Faculty agree to include review of transfer in all related courses; this outcome will be reassessed during next review |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: |

*Note*: Include General Education Courses table only if applicable. If no general education courses exist for program, remove table.

*At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary Information (as needed)

Evidence of Learning: Courses within the Major

| Evidence of Learning: Courses within the Major | | | | | |
|---|---|---|---|---|---|
| Measurable Learning Outcome<br><br>Students will… | Method of Measurement<br><br>Direct and Indirect Measures* | Threshold for Evidence of Student Learning | Findings Linked to Learning Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| Learning Outcome 1.A: | Measure 1: (Ex. A set of 10 multiple choice questions from Exam 1) | Measure 1: (Ex. 85% of students will score 80% or better on 10 questions) | Measure 1: (Ex. 93% of students scored 80% or better on 10 questions) | Measure 1: (Ex. Students successfully demonstrated interpretation skills) | Measure 1: (Ex. No curricular or pedagogical changes needed at this time) |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: |
| Learning Outcome 2.A: | Measure 1: (Ex. Results of standardized test) | Measure 1: (Ex. 85% of students will score at or above the national average) | Measure 1: (Ex. 90% of students scored above national average) | Measure 1: (Ex. Students successfully demonstrated competence; lowest average score was in transfer of knowledge, where only 69% of questions were answered correctly | Measure 1: (Ex. Faculty agree to include review of transfer in all related courses; this outcome will be reassessed during next review |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: |

*At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary Information (as needed)

Evidence of Learning: High Impact or Service Learning

| Evidence of Learning: High Impact Service Learning | | | | | |
|---|---|---|---|---|---|
| Measurable Learning Outcome<br><br>Students will… | Method of Measurement<br><br>Direct and Indirect Measures* | Threshold for Evidence of Student Learning | Findings Linked to Learning Outcomes | Interpretation of Findings | Action Plan/Use of Results |
| Learning Outcome 1.A: | Measure 1: (Ex. A set of 10 multiple choice questions from Exam 1) | Measure 1: (Ex. 85% of students will score 80% or better on 10 questions) | Measure 1: (Ex. 93% of students scored 80% or better on 10 questions) | Measure 1: (Ex. Students successfully demonstrated interpretation skills) | Measure 1: (Ex. No curricular or pedagogical changes needed at this time) |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: |
| Learning Outcome 2.A: | Measure 1: (Ex. Results of standardized test) | Measure 1: (Ex. 85% of students will score at or above the national average) | Measure 1: (Ex. 90% of students scored above national average) | Measure 1: (Ex. Students successfully demonstrated competence; lowest average score was in transfer of knowledge, where only 69% of questions were answered correctly | Measure 1: (Ex. Faculty agree to include review of transfer in all related courses; this outcome will be reassessed during next review |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: |

*At least one measure per objective must be a direct measure. Indirect measures may be used to supplement evidence provided via the direct measures.

Summary Information (as needed)

E. Academic Advising

Advising Strategy and Process

All Manufacturing Engineering Technology students are required to meet with a faculty advisor at least annually for course and program advisement. Students may call 801-626-6305 for more information or to schedule an appointment. Advisement may also be obtained in Engineering Technology, room 214 and 218D.

Effectiveness of Advising

The current advisement process appears to be effective as there are very few issues concerning wrong advising. Advising as done in the program covers both career guidance and what courses students need to be taking.

Past Changes and Future Recommendations

There currently are no plans to change the current advising process.

F. Faculty

Faculty Demographic Information

The Manufacturing Engineering Technology program currently has six full-time faculty members and approximately 2 adjunct faculty who teach part-time. The number of adjuncts varies by semester and is included in the subcategory on adjuncts.

| Main Categories | | |
|---|---|---|
| | Subcategories | Number |
| Gender | Male | 6 |
| | Female | 0 |
| Ethnicity | Euro-American | 6 |
| | other | 0 |
| Degree | Bachelors | 0 |
| | Masters | 5 |
| | PhD | 1 |
| Rank/Tenure | Tenured | 3 |
| | Tenure Track | 3 |
| | Instructor | 0 |
| | Adjunct | 2 |
| Year Teaching | <5 | 1 |
| | 5-20 | 2 |
| | >20 | 3 |

Programmatic/Departmental Teaching Standards

All faculty in the College are expected to be good teachers. Where there is a perceived weakness in a faculty member's teaching, they are counseled by a mentor, encouraged to attend the on-campus presentations on teaching, and in some cases have been sent to national conferences specific to teaching.

Faculty Qualifications

To be tenured or be hired on tenure track, faculty must meet one of the two following requirements:

1. Attainment of the earned doctorate in a field applicable to Manufacturing Engineering Technology and three years of full-time industrial experience.
2. Attainment of a master's degree in a field applicable to Manufacturing Engineering Technology and five years of full-time industrial experience.

Adjunct faculty must have a degree in Manufacturing Engineering Technology or its equivalent or in a related field and be currently active in the content area in which they are teaching.

Evidence of Effective Instruction

i. Regular Faculty
   Tenure track faculty are evaluated each semester for every class they teach. Tenured faculty are evaluated in at least one class each semester they teach. Any concerns are discussed with the department chair.

ii. Adjunct Faculty
   Adjunct faculty are evaluated each semester for every class they teach. Any concerns are discussed with the department chair.

Mentoring Activities

Faculty are mentored by the program coordinator and by the program chair. Faculty mentors also work with adjunct faculty to improve teaching and to assist with classroom issues such as testing, syllabi, online, cheating, and classroom discipline.

Diversity of Faculty

Ongoing Review and Professional Development

Tenure track faculty are reviewed informally once a year by the department chair and formally during their third and sixth years. Tenured faculty are reviewed every three years by the department chair.

Faculty members are provided opportunities for professional development in areas of instruction, scholarship, and service. This includes taking professional courses, attending and/or presenting at professional conferences, and participating in research and scholarly discussion groups on campus. In addition, all faculty are encouraged to submit proposals to the Research Scholarship and Professional Growth Committee and the Academic Resources and Computing Committee.

G. Support Staff, Administration, Facilities, Equipment, and Library

Adequacy of Staff

The department has one and a half technicians, one secretary, and several student aides that are shared among all of the programs. This number of staff is adequate to meet the needs of the program.

i. Ongoing Staff Development

Staff are encouraged to seek professional development where appropriate and have attended conferences off-campus and out-of-state paid for by the College.

Adequacy of Administrative Support

While the operating budgets are adequate to support the program, there is no capital equipment budget in the College. Therefore acquisition of new equipment is dependent upon other sources of funding which can be problematic. However, there is a definite lack of support for hiring new faculty which causes the faculty in the program to teach overloads thus reducing their time to participate in scholarly activities or service.

Adequacy of Facilities and Equipment

The primary tool used by the program is the personal computer. Currently the College is able to replace its computers every three years which is sufficient to keep them current with the available software. Some of the equipment used in the support courses is getting old and in need of replacement. Because of the budget situation discussed in

the previous paragraph, the issue of when this equipment will be replaced is somewhat up in the air.

Adequacy of Library Resources

The library resources are adequate to support the program.

H. Relationships with External Communities

The faculty have a close working relationship with many of the employers and manufacturing companies in the area and around the country. Many of these companies have hired our students in the past and continue to recruit our graduates. Some of the personnel in management positions from these companies are graduates from the MfET program at Weber State.

Some of our faculty continue to consult and work for these companies on a contract basis. Our faculty are also involved in the Society of Manufacturing Engineers both in our student chapter and in the local professional chapter where relationships between WSU and the external community are constantly being developed.

Description of Role in External Communities

The MFET program supports the manufacturing industry in Utah where there are over 1150 manufacturing firms with more than 10 employees. Most of our graduates are employed in northern Utah, which includes primarily Weber County, Salt Lake County and Davis County. Together these three counties comprise about 90% of the manufacturing in Utah. Important local manufacturing firms include the following:

Advanced Drainage Sys.
Associated Food Stores
ATK*
Autoliv*
Barnes Aerospace Ogden Division*
Cerrowire
Chromalox
Clover Club Foods
CT Film
ELKAY West (Dayton-Ogden Corp)*
DFG
England/Corsair
Fieldcrest Cabinets
Fresenius
Futura
Great Salt Lake Mineral
GSC Casting*
Honeywell*
Hurco Industries
Intouch Machining
Iomega
Jetway Systems/FMC
Kimberly-Clark
Layton City
Lifetime Products*
Naptech
National Standard

Northrop Grumman*
Orbit
Parker Hannifin*
Petersen, Inc.
Precision Plating
Promold*
Richards Sheetmetal
Skydandee Mfg.
Smith's Frozen Dairy Plant
Syro
Tech Steel
W.R. White Company
Wavel Huber Wood Prod.
Wells Cargo
Western Coating
Western Zirconium
Williams International
Zero Enclosures

* Current members of Industrial Advisory Committee

Summary of External Advisory Committee Minutes

MANUFACTURING ENGINEERING TECHNOLOGY
ADVISORY COMMITTEE
September 13, 2013
Meeting Minutes

Industry Members (bold=in attendance)

**Cameron Swaner (GE)**
**Dave Ferrell (Promold)**
**Joel Clarkson (SLCC)**
**Keith Fisher (Parker-Hannifin)**
**Ken Mortensen (Envirotech Molded)**
**Mark Ripke (Boeing)**
**Mitch Johnson (Lifetime)**
**Rex Hardman (Miller Electric)**
**Ned Blackett (Leanwerks)**
**William Fitzgerald (GSC)**
Brian DeRoche (JBT)
Dan Berry (Barnes Aerospace)
Denver Merrill (Harristone)
John Hicken (Companion Systems)
Mark Coy (Setpoint)
Mark Jones (Clean Machine)

MFET Department

**Mark Baugh – MFET Welding Emphasis**
**George Comber – MFET Plastics Emphasis**
**Andrew Deceuster – MFET/MET**
**Pat DeJong – Dept. Administration**
**Kelly Harward - MFET**
**Julie McCulley – EET/MFET**
**Rick Orr – Dept. Chairman**
**Kerry Tobin – MFET**
**COAST**
**Karen Doutre –Career Services**
**Dave Ferro – Dean**
Kelly Stackaruk – Development Director

1. Lunch / Introductions / New faculty member Andrew Deceuster

2. Status of 3 emphases in MFET
- 163 total majors
- 73 Welding
- 56 Production Operations and Controls
- 23 Plastics & Composites
- 11 No emphasis declared

3. Review Mission Statement, Educational Objects

Action Item: Add mission statement to website (Pat DeJong)

4. Student Assessment

SME certification exam given to students their last semester.

See attached group summary provided by SME.

5. Graduate Improvements

- Electronics/Automation

Discussion held automation needs in industry.
-integrate servos, steppers, pneumatics, hydraulics, end of arm tooling
-teach pendants easy to use, it's the theory and integration students need to learn.
-Students need to know how to tie process control into automation

- Adv Machining Controls
- Programming - Discussed if need for a programming course. Discussed TK solver v. MatLab. SLCC and USU use MatLab.
- Design Controls- need for students effectively manage change – PDM, PLM

6. Proposed program changes

- Welding corrosion no longer stand alone course, include as a module in other courses
- Add a welding robotics course
- Discussed starting MATH requirements at MATH 1210 (Calculus), instead of MATH 1080 (Pre-Calc), this would free up hours for technology courses. SLCC is moving in that direction as well.
- Add a 2-3 credit hour Intro to MFET
- Discussed changing MFET 2150 to a MIG course, rather than stick.
- Discussed need for manual v. CNC machining course.

7. New equipment

- Water jet cutter
- Welding robot

8. Employment outlook

- Most advisory board members predicted growth, or maintaining, current positions in the next year.
- Karen Doutre, Career Services, spoke about the upcoming Tech Career Fair. See attached letter from the dean, Dave Ferro.

9. MFET Advisory Board Survey

Copy attached if you did not get a chance to fill out. Email back to Kelly Harward (kharward@weber.edu)

I. Results of Previous Program Reviews (Since there was no available data from a Regents Review, the following is the results of a previous ABET Program Review).

For this program, the assessment and evaluation processes do not appear to be *distinguishing between program educational objectives and program outcomes. For instance, the Student Satisfaction Survey is administered to graduates two to three years after graduation, the time period within which program educational objectives would normally be assessed; however, this survey focuses on program outcomes that are normally measured prior to graduation. In addition, questions on the Employer Survey are not clearly related to program educational objectives, and there are no defined benchmarks to evaluate program educational objectives. These issues can lead to confusion or errors in the assessment and evaluation process which, in turn, may result inactions that are not productive in improving the program. Without clearly specified metrics, it is not possible to reliably measure the degree in which corrective actions have improved the program. Therefore, this finding remains a Concern until the program demonstrates (1) that it is using a documented process incorporating relevant data to regularly assess its program educational objectives and program outcome and to evaluate the extent to which they are being met, and (2) that it is using results of these evaluations of program educational objectives and program outcomes to effect continuous improvement of the program through a documented plan.

Due Process Response: The program-responded that changes have been made to the assessment process to simplify the format and clarify the differences while maintaining the relationship between objectives outcomes. An alumni survey will be sent out each summer to graduates, and employer surveys will be sent out in the summer to employers of graduates. The surveys will focus on program educational objectives and will have benchmarks to define satisfactory performance. Both will be reviewed by the

department as well as the Advisory Committee. The assessment of program outcomes assessment will be conducted through the SME certification examination, a student exit survey, and selected student work that includes the senior project. Benchmarks have been established and the responsible parties have been identified. Documentation of the changes was included in the due process response.

Status after Due Process: This finding remains a Concern until the program demonstrates that it is using results of the evaluations of program educational objectives and program outcomes to effect continuous improvement of the program through a documented plan.

| Problem Identified | Action Taken | Progress |
|---|---|---|
| Issue 1 | Previous 5 Year Program Review: | |
| | Year 1 Action Taken: | Define metrics |
| | Year 2 Action Taken: | Document Process /relevant data |
| | Year 3 Action Taken: | Assess courses in cycle, collect data |
| | Year 4 Action taken: | Continue to assess courses |
| Issue 2 | Previous 5 Year Program Review: | |
| | Year 1 Action Taken: | Implement improved Survey Questions |
| | Year 2 Action Taken: | Survey sent out to graduates, reviewed |
| | Year 3 Action Taken: | Survey sent out to graduates, reviewed |
| | Year 4 Action taken: | Survey sent out to graduates, reviewed |

Summary Information (as needed)

J. Action Plan for Ongoing Assessment Based on Current Self Study Findings

Action Plan for Evidence of Learning Related Findings

| Problem Identified | Action to Be Taken |
|---|---|
| Issue 1 | Current 5 Year Program Review: |
| | Year 1 Action to Be Taken: |
| | Year 2 Action to Be Taken: |
| | Year 3 Action to Be Taken: |
| | Year 4 Action to Be Taken: |
| Issue 2 | Current 5 Year Program Review: |
| | Year 1 Action to Be Taken: |
| | Year 2 Action to Be Taken: |
| | Year 3 Action to Be Taken: |
| | Year 4 Action to Be Taken: |

Summary Information (as needed)

Action Plan for Staff, Administration, or Budgetary Findings

| Problem Identified | Action to Be Taken |
|---|---|
| Issue 1 | Current 5 Year Program Review: |
| | Year 1 Action to Be Taken: |
| | Year 2 Action to Be Taken: |
| | Year 3 Action to Be Taken: |
| | Year 4 Action to Be Taken: |
| Issue 2 | Current 5 Year Program Review: |
| | Year 1 Action to Be Taken: |
| | Year 2 Action to Be Taken: |
| | Year 3 Action to Be Taken: |
| | Year 4 Action to Be Taken: |

Summary Information (as needed)

K. Summary of Artifact Collection Procedure

| Artifact | Learning Outcome Measured | When/How Collected? | Where Stored? |
|---|---|---|---|
| (i.e. Final Project Rubric) | | (i.e. end of semester) | (i.e. electronic copies) |
| (i.e. Chi Tester Outcome Report) | | (i.e. 2-3 times per semester) | (i.e. electronic format, chi tester warehouse) |
| | | | |
| | | | |

Summary Information

Student artifacts are collected by the instructor for courses he/she wishes to use for measuring outcomes. These artifacts are stored by the respective instructor for the course evaluation(s), the instructor evaluation for tenure and post tenure review, and for program assessment. A sampling for these artifacts are collected by the program coordinator and placed in our shared network drive for the Mfet program at: O:\Accreditation and Assessment\ Regents\MfET\ StudentExamples_Assessment 2014-15

# APPENDICES

## Appendix A: Student and Faculty Statistical Summary

| Engineering Technology | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---|---|---|---|---|---|
| **Student Credit Hours Total [1]** | **11,230** | **10,970** | **12,102** | **11,403** | 13247 |
| **Design Engineering Tech** | **4,009** | **3,822** | **4,366** | **4,758** | **5,394** |
| **Electronic Engineering Tech*** | **2,891** | **2,524** | **2,899** | **1,778** | **1,862** |
| **Mechanical Engineering Tech** | **1,585** | **1,869** | **2,015** | **1,992** | **2,535** |
| **Manufacturing Engineering Tech** | **2,745** | **2,755** | **2,822** | **2,875** | **3,456** |
| **Student FTE Total [2]** | **374.33** | **365.67** | **403.40** | **380.10** | **441.57** |
| **Student Majors [3]** | 659 | 649 | 696 | 716 | 703 |
| **Design Engineering Tech** | 121 | 146 | 143 | 127 | 120 |
| **Electronic Engineering Tech** | 233 | 177 | 173 | 116 | 106 |
| **Mechanical Engineering Tech** | 178 | 192 | 238 | 273 | 245 |
| **Manufacturing Engineering** | 127 | 134 | 142 | 152 | 163 |
| **General Technology** | 0 | 0 | 0 | 48 | 69 |
| **Program Graduates [4]** | | | | | |
| Associate Degree | 30 | 32 | 33 | 17 | 23 |
| Bachelor Degree | 69 | 60 | 83 | 65 | 68 |
| **Student Demographic Profile [5]** | | | | | |
| Female | 61 | 63 | 63 | 85 | 88 |
| Male | 598 | 586 | 633 | 631 | 615 |
| **Faculty FTE Total [6]** | **24.04** | **23.61** | **21.84** | **21.26** | |
| Adjunct FTE | 3.69 | 5.71 | 5.05 | **5.46** | |
| Contract FTE | 20.35 | 17.9 | 16.79 | 15.8 | |
| **Student/Faculty Ratio [7]** | **18.39** | **20.43** | **24.03** | **24.06** | |

*Note*: Data provided by Institutional Research

Student Credit Hours Total represents the total department-related credit hours for all students per academic year. Includes only students reported in Banner system as registered for credit at the time of data downloads.

Student FTE Total is the Student Credit Hours Total divided by 30.
Student Majors is a snapshot taken from self-report data by students in their Banner profile as of the third week of the Fall term for the academic year.

Program Graduates includes only those students who completed all graduation requirements by end of Spring semester for the academic year of interest. Students who do not meet this requirement are included in the academic year in which all requirements are met. Summer is the first term in each academic year.

Student Demographic Profile is data retrieved from the Banner system.

Faculty FTE is the aggregate of contract and adjunct instructors during the fiscal year. Contract FTE includes instructional-related services done by "salaried" employees as part of their contractual commitments. Adjunct FTE includes instructional-related wages that are considered temporary or part-time basis. Adjunct wages include services provided at the Davis campus, along with on-line and Continuing Education courses.

Student/Faculty Ratio is the Student FTE Total divided by the Faculty FTE Total.

Appendix B: Contract/Adjunct Faculty Profile

| Name | Gender | Ethnicity | Rank | Tenure Status | Highest Degree | Years of Teaching | Areas of Expertise |
|---|---|---|---|---|---|---|---|
| DET | | | | | | | |
| John Julander | M | W | Adjunct | No | BS | 5 | Comp. Graphics |
| Marni Tobin | F | W | Adjunct | No | BS | 4 | CAD |
| Jennifer Lanzetti | F | W | Adjunct | No | BS | 1 | Comp. Graphics |
| | | | | | | | |
| MET | | | | | | | |
| Doug Hogge | M | W | Adjunct | No | MS | 1 | FEA, Design |
| Adam Hazard | M | W | Adjunct | No | MBA | 3 | Mech. Design |
| MFET | | | | | | | |
| Mary Foss | F | W | Adjunct | No | MS | 5 | Math, Stats |
| Thomas Russel | M | W | Adjunct | No | BS | 5 | Machining |
| Kerry Gibson | M | W | Adjunct | No | BS | 1 | Stats, Quality |
| | | | | | | | |
| EET | | | | | | | |
| Kevin Andreasen | M | W | Adjunct | No | BS | 1 | Electronics |
| Cory Tonks | M | W | Adjunct | No | MS | 1 | Electronics |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Summary Information (as needed)

Appendix C: Staff Profile

| Name | Gender | Ethnicity | Job Title | Years of Employment | Areas of Expertise |
|---|---|---|---|---|---|
| Roger Anderson | M | W | Technician | 24 | Equipment, automation, computer networks |
| Cordell Gold | M | W | Technician | 1 | Maintenance |
| Pat DeJong | F | W | Admin. Spec. | 9 | Administration |

Summary Information (as needed)

Appendix D: Financial Analysis Summary

| Department – ET (includes EET, DET, MET, MFET | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 |
|---|---|---|---|---|---|
| Undergraduate | | | | | |
| Instructional Costs (faculty salaries & ben.) | | | | | |
| DET | 413,451 | 314,664 | 323,562 | 313,820 | 315,445 |
| MET | | | | | |
| MFET | | | | | |
| EET | | | | | |
| Staff salaries | | | | | |
| Support Costs (current expense – MET, MFET, DET | $52,000 | $52,000 | $52,000 | $52,000 | $52,000 |
| Support Costs (current expense – EET) | n/a | n/a | $15,000 | $5,000 | $8,000 |
| | | | | | |
| Total Expense | | | | | |

*Note*: Data from Financial Summary by Org report. Note; EET used to be a separate entity and was added to ET in 2010. The original budget as a separate department was $25,000. Upon relocation to ET the EET current expense budget was reduced to $15,000 in 2011-12 (fewer faculty), 5000 in 2012-13, and $1000 in 2013-14. Through negotiations the budget was restored to $8000 in 2013-14 and $10,000 in 2014-15.

Appendix E: External Community Involvement Names and Organizations

| MET - Dustin Birch, MFET - Kelly Harward | | |
|---|---|---|
| MET/MFET | Dan Berry | Barnes Aerospace |
| MET/MFET | Mark Coy | Setpoint Systems |
| MET/MFET | Brian DeRoche | JBT Corporation |
| MET/MFET | Dave Farrell | ProMold, Inc |
| MFET | William Fitzgerald | GSC Foundaries |
| MET | Mark Jones | Clean Machine |
| MET/MFET | Reid Leland | LeanWerks |
| MET/MFET | Mark Ripke | Boeing |
| MET/MFET | Jared Bringhurst or MET | Futura - manufacturing manager - he has MET students working for him that he likes |
| MET/MFET | Dave Winter | Lifetime |
| MET | Craig Johnson | Chromalox |
| MET | Cody Hathaway | Lifetime Products |
| DET | Name | Company |
| GLEN WEST - PROGRAM COORDINATOR | | |
| arch | David Bailey | Destination Homes |
| mech | Jason Barker | Barnes |
| mech | Gordon Cumming | L-3 Communications |
| mech | Tom DeJong | WesTech Engineering |
| arch | Roger Jackson | FFKR Architects |
| mech | David Johnston | Daimler Trucks North America |
| arch | Jennifer Lanzetti | Jacobsen Construction |
| both | Mike Lyman | Paradigm Solutions Group |
| arch | Kirt Merril | Nilson Homes |
| arch | Mike Plaudis | Big D |
| arch | Bill Salerno | Salerno Architects |

| | | |
|---|---|---|
| arch | Dan Schmeling | ARETE.DBL |
| arch | Melissa Thiessens | GSBS Architects |
| mech | Alan Wadge | ATK |
| arch | Kelby York | York Engineer |
| EET | Name | Company |
| JULIE MCCULLEY - PROGRAM COORDINATOR | | |
| EET | Carl Belnap | Design Criteria, Inc |
| EET | Doug Carlisle | Varian |
| EET | Jason Corob | L-3 Communications |
| EET | Michael Clark | FAA |
| EET | Larry Riggs | Autoliv |
| EET | Scott Snarr | L-3 Communications  Tech Recruiter |
| EET | Joe VanDenBerghe | Setpoint Systems |
| EET | Clayton Wahlquist | L-3 Communications |
| MFET | Name | Company |
| KELLY HARWARD - PROGRAM COORDINATOR | | |
| MFET | Jared Bringhurst | Futura |
| MFET | Keith Fisher | Parker-Hannifin Control Systems |
| MFET | Mitch Johnson | Lifetime Products |
| MFET | Rex Hardman | Miller Electric |
| MFET | John Hicken | Companion Systems |
| MFET | Denver Merrill | Harristone |
| MFET | Mark Miller | Elkay |
| MFET | Steve Moore | Barnes Aerospace |
| MFET | Roger Shuman | Wells Cargo |

## Appendix F: External Community Involvement Financial Contributions

| Organization | Amount | Type |
|---|---|---|
| Perkins – US Dept. of Education | | |
| (varies - ranges from $45,000 to $16, 900 | $16,900 | Grant |
| UCAP Grant 2014 | $150,000 | Grant |
| Mark Graves | $40,000* | Donation |
| J D Machine | $50,000* | " |
| David Roubinet | $2,800/yr* | " |
| Autoliv | $5,000/yr* | " |
| Parker Aerospace | $5,000/yr* | " |
| Barnes Aerospace | $2,500/yr* | " |

*For the Engineering Technology Department and shared among the four programs in the department.