Detailed Assessment Report  
2013-2014 Mechanical Engineering B.S.M.E.  
As of: 7/16/2014 10:37 AM Central

Mission / Purpose
Our mission, as aligned with the university, college, and department vision, is teaching, research, and service. The Department of Mechanical Engineering will: 1. Provide high-quality undergraduate, graduate, and continuing education in mechanical engineering that will prepare our graduates for professional careers and a lifetime of learning; 2. Conduct high-quality research programs that support the undergraduate and graduate education objectives, assist in economic development of the state and nation, and advance the general state of knowledge; 3. Serve individual practicing engineers, industry, government, educational entities, and technical societies through active involvement with these groups and by providing professional expertise; and 4. Ensure that our students are well educated technically, have some practical training, and have actively participated in professional society activities.

Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Knowledge of Math, Sci, Eng  
(Discipline Knowledge) An ability to apply knowledge of mathematics, science, and engineering

Related Measures
M 1: FE Math, Sci, Eng, morning pass rate  
Achieve a pass rate of greater than 85% of the national average on the morning portion of the Fundamentals of Engineering Exam.
Source of Evidence: Academic direct measure of learning - other  
Target:  
Pass rate > 85% of national average

M 2: Co-op Survey Math, Sci, Eng  
Achieve average scores on questions 14, 15, and 16 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other  
Target:  
Average scores > 1.9/3.0

M 3: ME 489 rubric apply ME knowledge  
Achieve average scores on item “a” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other  
Target:  
score on item a > 7

M 4: ME 490 rubric apply ME knowledge  
Achieve average scores on item “a” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Faculty pre-test / post-test of knowledge mastery  
Target:  
Score in Item a > 3/5

SLO 2: Experimental ability  
(Skills/Abilities) An ability to design and conduct experiments, as well as to analyze and interpret data

Related Measures
M 5: Co-op Survey experiments  
Achieve average scores on questions 20 and 21 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other  
Target:  
Average of questions 20 and 21 > 1.9/3

M 6: Student work in ME 360 and 460  
Achieve average scores greater than 2/3 by department assessment committee of student work in the laboratory courses ME 360 and ME 460
Source of Evidence: Academic direct measure of learning - other  
Target:
assessment committee score of > 2/3

SLO 3: Ability to design a system
An ability to design a system, component, or process to meet desired needs

Connected Documents
- Mechanical engineering bachelor's Curriculum Map I
- Mechanical engineering bachelor's Curriculum Map II

Related Measures

M 7: Co-op survey design
Achieve average scores on question 22 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 1.9/3 on question 22

M 8: ME 489 rubric design
Achieve average scores on item “c” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 7/10

M 9: ME 490 rubric design
Achieve average scores on item “c” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 3/5

SLO 4: Multi-disciplinary teams
An ability to function on multi-disciplinary teams

Connected Documents
- Mechanical engineering bachelor's Curriculum Map I
- Mechanical engineering bachelor's Curriculum Map II

Related Measures

M 10: Co-op survey teams
Achieve average scores on question 10 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 1.9/3

M 11: ME 489 rubric teams
Achieve average scores on item “d” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 7/10

M 12: ME 490 rubric teams
Achieve average scores on item “d” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 3/5

SLO 5: Identify, formulate, and solve engineering problems
An ability to identify, formulate, and solve engineering problems

Connected Documents
- Mechanical engineering bachelor's Curriculum Map I
- Mechanical engineering bachelor's Curriculum Map II

Related Measures

M 13: Co-op Survey engineering problem solving
Achieve average scores on questions 18 and 19 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
- score > 1.9/3

M 14: ME 489 rubric problem solving
Achieve average scores on item “e” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
- >7/10

M 15: ME 490 rubric problem solving
Achieve average scores on item “e” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target: >3/5

**SLO 6: Professional and ethical responsibility**
An understanding of professional and ethical responsibility

**Connected Documents**
- Mechanical engineering bachelors Curriculum Map I
- Mechanical engineering bachelors Curriculum Map II

**Related Measures**

**M 16: Co-op survey ethics**
Achieve average scores on question 11 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target: >1.9/3

**M 17: ME 489 rubric ethics**
Achieve average scores on item "f" of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target: >7/10

**M 18: ME 490 rubric ethics**
Achieve average scores on item "f" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target: > 3/5

**SLO 7: Communicate effectively**
An ability to communicate effectively

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- Mechanical engineering bachelors Curriculum Map II

**Related Measures**

**M 19: Writing score in ME 360 and ME 460**
Average of the writing score by English Department consultant on lab reports for ME 360 and ME 460 greater than 80/100
Source of Evidence: Writing exam to assure certain proficiency level
Target: >80%

**M 20: Co-op Survey Communication**
Achieve average scores on questions 12 and 13 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target: >1.9/3

**M 21: ME 490 rubric communication**
Achieve average scores on item "g" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target: >3/5

**SLO 8: Global and societal context**
The broad education necessary to understand the impact of engineering solutions in a global and societal context

**Connected Documents**
- Mechanical engineering bachelors Curriculum Map I
- Mechanical engineering bachelors Curriculum Map II

**Related Measures**

**M 22: Senior Exit global and societal**
Average scores of 3.5/5 on question 15 of the department Senior Exit Survey
Source of Evidence: Academic direct measure of learning - other
Target: >3.5/5

**M 23: ME 490 global and societal**
Achieve average scores on item "h" of the ME 490 assessment rubric greater than 3/5
Source of Evidence: Academic direct measure of learning - other
Target: >3/5

**SLO 9: Engage in life-long learning**
A recognition of the need for and an ability to engage in life-long learning
Connected Documents
Mechanical engineering bachelor's Curriculum Map I
Mechanical engineering bachelor's Curriculum Map II

Related Measures

**M 24: ME 489 lifelong learning**
Achieve average scores on item "I" of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 7/10

**M 25: ME 490 lifelong learning**
Achieve average scores on item "I" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 3/5

**SLO 10: Contemporary issues**
A knowledge of contemporary issues

Connected Documents
Mechanical engineering bachelor's Curriculum Map I
Mechanical engineering bachelor's Curriculum Map II

Related Measures

**M 26: Co-op Survey contemporary issues**
Achieve average scores on question 17 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 1.9/3

**M 27: ME 490 contemporay issues**
Achieve average scores on item "J" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 3/5

**SLO 11: Techniques, skills, and modern eng. tools**
An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Connected Documents
Mechanical engineering bachelor's Curriculum Map I
Mechanical engineering bachelor's Curriculum Map II

Related Measures

**M 28: Co-op Survey modern skills and tools**
Achieve average scores on question 23 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 1.9/3

**M 29: ME 489 modern skills and tools**
Achieve average scores on item "K" of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 7/10

**M 30: ME 490 modern skills and tools**
Achieve average scores on item "K" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 3/5

**SLO 12: Thermal and mechanical systems**
The ability to work professionally in both thermal systems and mechanical systems

Connected Documents
Mechanical engineering bachelor's Curriculum Map I
Mechanical engineering bachelor's Curriculum Map II

Related Measures

**M 31: Student work 407 and 415**
Score greater than 2/3 on department Assessment Committee review of Student Work in ME 407 and ME 415
Source of Evidence: Academic direct measure of learning - other
**Target:**
> 2/3
M 32: Student work in ME 450
Score greater than 2/3 on department Assessment Committee review of Student Work in ME 450
Source of Evidence: Academic direct measure of learning - other
Target:
>2/3

Other Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

OthOtcm 13: Knowledge of Manufacturing Processes
Graduates will demonstrate knowledge of conventional and modern manufacturing methods and materials.

Related Measures

M 40: Student work in ME 383
Assessment Committee review of student work portfolio from ME 383 will score greater that 3/5 with 3 being satisfactory and 5 being excellent.
Source of Evidence: Academic direct measure of learning - other
Target:
Score of 3/5 or better on committee assessment of work portfolio.
Finding (2013-2014) - Target: Not Reported This Cycle
Not reported this cycle

M 41: ME 490 Assessment Rubric
Students will score greater than 3/5 on ME 490 Assessment rubric.
Source of Evidence: Capstone course assignments measuring mastery
Target:
Score > 3/5 on ME 490 assessment rubric
Finding (2013-2014) - Target: Met
Score of 4.1/5

M 42: Graduate Exit Interviews
Students will express satisfaction with their knowledge of manufacturing in the exit interviews.
Source of Evidence: Student satisfaction survey at end of the program
Target:
Students will express satisfaction with their manufacturing knowledge.
Finding (2013-2014) - Target: Not Reported This Cycle
Not reported this cycle
Related Action Plans (by Established cycle, then alpha):
Ad Hoc Committee to review the manufacturing content of the ME Curriculum
Established in Cycle: 2011-2012
Some weakness in outcome 13, knowledge of manufacturing practices, was identified in the exit interviews with graduates. This...
For full information, see the Details of Action Plans section of this report.

OthOtcm 14: Recognized quality
The program will improve and sustain a high level of recognized quality.

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 33: Maintain ABET assessment and accreditation
Conduct a detailed ABET assessment and maintain engineering accreditation
Source of Evidence: Academic indirect indicator of learning - other
Target:
remain accredited by ABET
Finding (2013-2014) - Target: Met
Program maintains accreditation. Program review scheduled for Fall term of 2013

M 34: Passing rate on FE. GT. national average
Maintain a pass rate on the Fundamentals of Engineering Exam that is equal to or greater than the national average
Source of Evidence: Academic indirect indicator of learning - other
Target:
Greater than the national average
Finding (2013-2014) - Target: Met
40 of 42 mechanical engineering students passed the National Fundamentals of Engineering Exam for Spring 2013 (95% pass rate) compared national pass rates of approximately 80 to 85% during the past few years.

OthOtcm 15: Optimal level
The program will build and sustain an optimal level of annual program enrollments and degree completions.

Connected Documents
**Related Measures**

**M 35: University statistics on graduation rate**
University statistics on graduation rate; maintain approximately 5 B.S. graduates per year per faculty member
Source of Evidence: Academic indirect indicator of learning - other

**Target:**
5 graduates per faculty member per year

**Finding (2013-2014) - Target: Met**
During the 2012 degree year there were 92 BSME graduates. Currently there are 18 faculty members not including the department head, yielding a graduate rate of 4.96.

**M 36: University statistics on annual enrollments**
University statistics on annual enrollments; achieve an undergraduate major enrollment of 600 to 650 students.
Source of Evidence: Academic indirect indicator of learning - other

**Target:**
650 students including freshmen

**Finding (2013-2014) - Target: Met**
The current enrollment of undergraduate students in mechanical engineering is 1090. This greatly exceeds the target.

**OthOtcn 16: Program value**
The program will be highly valued by its program graduates and other key constituencies it serves.

**Connected Documents**
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**Related Measures**

**M 37: University Graduating Senior Survey**
Data from the University Graduating Senior Survey on overall quality of the program; preparation for employment; and graduate school
Source of Evidence: Academic indirect indicator of learning - other

**Target:**
85% will find the program quality to be excellent or good
85% will find preparation for employment to be excellent or good
70% will find preparation for graduate school excellent to good

**M 38: Mechanical Engineering Senior Survey**
Data from the Mechanical Engineering Senior Survey on the quality of the curriculum
Source of Evidence: Academic indirect indicator of learning - other

**Target:**
85% will find curriculum excellent to good

**M 39: Cooperative Education Employer Survey**
Data from Cooperative Education Employer Survey on the preparation of our students
Source of Evidence: Academic indirect indicator of learning - other

**Target:**
85% employers will find graduate competence very strong or strong

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**Details of Action Plans for This Cycle (by Established cycle, then alpha)**

**Ad Hoc Committee to review the manufacturing content of the ME Curriculum**
Some weakness in outcome 13, knowledge of manufacturing practices, was identified in the exit interviews with graduates. This has been a continuing theme over the last few years. The source of the weakness appears to come from a perceived lack of practical aspects of manufacturing in the course ME 383 and a perceived excess of repetition of material from the prerequisite course MTE 271, Engineering Materials. An ad hoc committee of ME faculty with a majority of members who are familiar with manufacturing processes will be formed to work with the instructor of record of ME 383 and the mechanical systems faculty to review the manufacturing processes content of the curriculum and to recommend to the faculty any corrective actions needed.

**Established in Cycle:** 2011-2012
**Implementation Status:** Planned
**Priority:** High

**Relationships (Measure | Outcome/Objective):**
- **Measure:** Graduate Exit Interviews | **Outcome/Objective:** Knowledge of Manufacturing Processes

**Implementation Description:** A committee has been formed to review this item.
**Projected Completion Date:** 10/2012
**Responsible Person/Group:** The committee consist of Dr. Steve Shepard (Chair), Dr. Dan Fonseca, and Dr. Yuebin Guo.
Mission / Purpose

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Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Knowledge of Math, Sci, Eng
(Discipline Knowledge) An ability to apply knowledge of mathematics, science, and engineering

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<td>Target:</td>
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<tr>
<td>Pass rate &gt; 85% of national average</td>
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<tr>
<td>Finding (2012-2013) - Target: Met</td>
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<tr>
<td>Pass rate was 110% of national average</td>
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| M 2: Co-op Survey Math, Sci, Eng |
| Achieve average scores on questions 14, 15, and 16 of the Co-op Employer Survey of greater than 1.9/3.0. |
| Source of Evidence: Academic direct measure of learning - other |
| Target: |
| Average scores > 1.9/3.0 |
| Finding (2012-2013) - Target: Met |
| Score was 2.11/3.00 |

| M 3: ME 489 rubric apply ME knowledge |
| Achieve average scores on item “a” of the ME 489 assessment rubric greater than 7/10. |
| Source of Evidence: Academic direct measure of learning - other |
| Target: |
| score on item a > 7 |
| Finding (2012-2013) - Target: Met |
| Score was 8.70 |

| M 4: ME 490 rubric apply ME knowledge |
| Achieve average scores on item “a” of the ME 490 assessment rubric greater than 3/5. |
| Source of Evidence: Faculty pre-test / post-test of knowledge mastery |
| Target: |
| Score in Item a > 3/5 |
| Finding (2012-2013) - Target: Met |
| Score was 4.32 |

SLO 2: Experimental ability
(Skills/Abilities) An ability to design and conduct experiments, as well as to analyze and interpret data

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Target:
Average of questions 20 and 21 > 1.9/3

Finding (2012-2013) - Target: Met
Score was 2.13/3.0

M 6: Student work in ME 360 and 460
Achieve average scores greater than 2/3 by department assessment committee of student work in the laboratory courses ME 360 and ME 460
Source of Evidence: Academic direct measure of learning - other
Target:
assessment committee score of > 2/3
Finding (2012-2013) - Target: Met
Score for ME 360 was 2.7/3 and for ME 460 was 2.7/3

SLO 3: Ability to design a system
An ability to design a system, component, or process to meet desired needs

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 7: Co-op survey design
Achieve average scores on question 22 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
score > 1.9/3 on question 22
Finding (2012-2013) - Target: Met
Score was 2.2/3

M 8: ME 489 rubric design
Achieve average scores on item “c” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
score > 7/10
Finding (2012-2013) - Target: Met
Score was 8.75/10

M 9: ME 490 rubric design
Achieve average scores on item “c” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
score > 3/5
Finding (2012-2013) - Target: Met
Score was 4.75/5

SLO 4: Multi-disciplinary teams
An ability to function on multi-disciplinary teams

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 10: Co-op survey teams
Achieve average scores on question 10 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
score >1.9/3
Finding (2012-2013) - Target: Met
Score was 2.35/3

M 11: ME 489 rubric teams
Achieve average scores on item “d” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
score > 7/10
Finding (2012-2013) - Target: Met
Score was 10/10

M 12: ME 490 rubric teams
Achieve average scores on item “d” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:  
score > 3/5

Finding (2012-2013) - Target: Met  
Score was 4.45/5

SLO 5: Identify, formulate, and solve engineering problems  
An ability to identify, formulate, and solve engineering problems

Connected Documents  
Mechanical engineering bachelors Curriculum Map I  
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Related Measures

M 13: Co-op Survey engineering problem solving  
Achieve average scores on questions 18 and 19 of the Co-op Employer Survey of greater than 1.9/3.0.  
Source of Evidence: Academic direct measure of learning - other

Target:  
>1.9/3

Finding (2012-2013) - Target: Met  
Score was 2.13/3

M 14: ME 489 rubric problem solving  
Achieve average scores on item "e" of the ME 489 assessment rubric greater than 7/10.  
Source of Evidence: Academic direct measure of learning - other

Target:  
>7/10

Finding (2012-2013) - Target: Met  
Score was 9/10

M 15: ME 490 rubric problem solving  
Achieve average scores on item "e" of the ME 490 assessment rubric greater than 3/5.  
Source of Evidence: Academic direct measure of learning - other

Target:  
>3/5

Finding (2012-2013) - Target: Met  
Score was 4.32/5

SLO 6: Professional and ethical responsibility  
An understanding of professional and ethical responsibility

Connected Documents  
Mechanical engineering bachelors Curriculum Map I  
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 16: Co-op survey ethics  
Achieve average scores on question 11 of the Co-op Employer Survey of greater than 1.9/3.0.  
Source of Evidence: Academic direct measure of learning - other

Target:  
>1.9/3

Finding (2012-2013) - Target: Met  
Score was 2.25/3

M 17: ME 489 rubric ethics  
Achieve average scores on item "f" of the ME 489 assessment rubric greater than 7/10.  
Source of Evidence: Academic direct measure of learning - other

Target:  
>7/10

Finding (2012-2013) - Target: Met  
Score was 10/10

M 18: ME 490 rubric ethics  
Achieve average scores on item "f" of the ME 490 assessment rubric greater than 3/5.  
Source of Evidence: Academic direct measure of learning - other

Target:  
> 3/5

Finding (2012-2013) - Target: Met  
Score was 4.25/5

SLO 7: Communicate effectively  
An ability to communicate effectively

Connected Documents  
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Mechanical engineering bachelors Curriculum Map II

Related Measures
M 19: Writing score in ME 360 and ME 460
Average of the writing score by English Department consultant on lab reports for ME 360 and ME 460 greater than 80/100
Source of Evidence: Writing exam to assure certain proficiency level
    Target: >80%

M 20: Co-op Survey Communication
Achieve average scores on questions 12 and 13 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
    Target: >1.9/3
    Finding (2012-2013) - Target: Met
    Score was 2.05/3

M 21: ME 490 rubric communication
Achieve average scores on item “g” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
    Target: >3/5
    Finding (2012-2013) - Target: Met
    Score of 4.4/5

SLO 8: Global and societal context
The broad education necessary to understand the impact of engineering solutions in a global and societal context
    Connected Documents
    Mechanical engineering bachelors Curriculum Map I
    Mechanical engineering bachelors Curriculum Map II
    Related Measures

M 22: Senior Exit global and societal
Average scores of 3.5/5 on question 15 of the department Senior Exit Survey
Source of Evidence: Academic direct measure of learning - other
    Target: >3.5/5
    Finding (2012-2013) - Target: Met
    Score of 4/5

M 23: ME 490 global and societal
Achieve average scores on item “h” of the ME 490 assessment rubric greater than 3/5
Source of Evidence: Academic direct measure of learning - other
    Target: >3/5
    Finding (2012-2013) - Target: Met
    Score of 4.2/5

SLO 9: Engage in life-long learning
A recognition of the need for and an ability to engage in life-long learning
    Connected Documents
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    Mechanical engineering bachelors Curriculum Map II
    Related Measures

M 24: ME 489 lifelong learning
Achieve average scores on item “i” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
    Target: > 7/10
    Finding (2012-2013) - Target: Met
    Score of 9.18/10

M 25: ME 490 lifelong learning
Achieve average scores on item “i” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
    Target: > 3/5
    Finding (2012-2013) - Target: Met
    Score of 4.05/5

SLO 10: Contemporary issues
A knowledge of contemporary issues
    Connected Documents
    Mechanical engineering bachelors Curriculum Map I
Related Measures

M 26: Co-op Survey contemporary issues
Achieve average scores on question 17 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
>1.9/3
Finding (2012-2013) - Target: Met
Score of 2.07/3

M 27: ME 490 contemporary issues
Achieve average scores on item "j" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
>3/5
Finding (2012-2013) - Target: Met
Score of 4.05/5

SLO 11: Techniques, skills, and modern eng. tools
An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

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Mechanical engineering bachelors Curriculum Map II

Related Measures

M 28: Co-op Survey modern skills and tools
Achieve average scores on question 23 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
>1.9/3
Finding (2012-2013) - Target: Met
Score of 2.14/3

M 29: ME 489 modern skills and tools
Achieve average scores on item "k" of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
>7/10
Finding (2012-2013) - Target: Met
Score of 9.84/10

M 30: ME 490 modern skills and tools
Achieve average scores on item "k" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
>3/5
Finding (2012-2013) - Target: Met
Score of 4.2/5

SLO 12: Thermal and mechanical systems
The ability to work professionally in both thermal systems and mechanical systems

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 31: Student work 407 and 415
Score greater than 2/3 on department Assessment Committee review of Student Work in ME 407 and ME 415
Source of Evidence: Academic direct measure of learning - other
Target:
> 2/3
Finding (2012-2013) - Target: Met
Score of 2.5/3

M 32: Student work in ME 450
Score greater than 2/3 on department Assessment Committee review of Student Work in ME 450
Source of Evidence: Academic direct measure of learning - other
Target:
> 2/3
Finding (2012-2013) - Target: Met
Other Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

OthOtcm 13: Knowledge of Manufacturing Processes
Graduates will demonstrate knowledge of conventional and modern manufacturing methods and materials.

Related Measures

M 40: Student work in ME 383
Assessment Committee review of student work portfolio from ME 383 will score greater that 3/5 with 3 being satisfactory and 5 being excellent.
Source of Evidence: Academic direct measure of learning - other
Target:
Score of 3/5 or better on committee assessment of work portfolio.

M 41: ME 490 Assessment Rubric
Students will score greater than 3/5 on ME 490 Assessment rubric.
Source of Evidence: Capstone course assignments measuring mastery
Target:
Score > 3/5 on ME 490 assessment rubric

M 42: Graduate Exit Interviews
Students will express satisfaction with their knowledge of manufacturing in the exit interviews.
Source of Evidence: Student satisfaction survey at end of the program
Target:
Students will express satisfaction with their manufacturing knowledge.

Related Action Plans (by Established cycle, then alpha):
Ad Hoc Committee to review the manufacturing content of the ME Curriculum
Established in Cycle: 2011-2012
Some weakness in outcome 13, knowledge of manufacturing practices, was identified in the exit interviews with graduates. This...
For full information, see the Details of Action Plans section of this report.

OthOtcm 14: Recognized quality
The program will improve and sustain a high level of recognized quality.

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 33: Maintain ABET assessment and accreditation
Conduct a detailed ABET assessment and maintain engineering accreditation
Source of Evidence: Academic indirect indicator of learning - other
Target:
remain accredited by ABET

M 34: Passing rate on FE, GT. national average
Maintain a pass rate on the Fundamentals of Engineering Exam that is equal to are greater than the national average
Source of Evidence: Academic indirect indicator of learning - other
Target:
Greater than the national average

OthOtcm 15: Optimal level
The program will build and sustain an optimal level of annual program enrollments and degree completions.

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 35: University statistics on graduation rate
University statistics on graduation rate; maintain approximately 5 B.S. graduates per year per faculty member
Source of Evidence: Academic indirect indicator of learning - other
Target:
5 graduates per faculty member per year

M 36: University statistics on annual enrollments
University statistics on annual enrollments; achieve an undergraduate major enrollment of 600 to 850 students.
Source of Evidence: Academic indirect indicator of learning - other
Target:
650 students including freshmen
OthOtcn 16: Program value
The program will be highly valued by its program graduates and other key constituencies it serves.

Connected Documents
- Mechanical engineering bachelors Curriculum Map I
- Mechanical engineering bachelors Curriculum Map II

Related Measures

M 37: University Graduating Senior Survey
Data from the University Graduating Senior Survey on overall quality of the program; preparation for employment; and graduate school
Source of Evidence: Academic indirect indicator of learning - other
Target:
85% will find the program quality to be excellent or good
85% will find preparation for employment to be excellent or good
70% will find preparation for graduate school excellent to good

M 38: Mechanical Engineering Senior Survey
Data from the Mechanical Engineering Senior Survey on the quality of the curriculum
Source of Evidence: Academic indirect indicator of learning - other
Target:
85% will find curriculum excellent to good

M 39: Cooperative Education Employer Survey
Data from Cooperative Education Employer Survey on the preparation of our students
Source of Evidence: Academic indirect indicator of learning - other
Target:
85% employers will find graduate competence very strong or strong

Details of Action Plans for This Cycle (by Established cycle, then alpha)

Ad Hoc Committee to review the manufacturing content of the ME Curriculum

Some weakness in outcome 13, knowledge of manufacturing practices, was identified in the exit interviews with graduates. This has been a continuing theme over the last few years. The source of the weakness appears to come from a perceived lack of practical aspects of manufacturing in the course ME 383 and a perceived excess of repetition of material from the prerequisite course MTE 271, Engineering Materials. An ad hoc committee of ME faculty with a majority of members who are familiar with manufacturing processes will be formed to work with the instructor of record of ME 383 and the mechanical systems faculty to review the manufacturing processes content of the curriculum and to recommend to the faculty any corrective actions needed.

Established in Cycle: 2011-2012
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
- Measure: Graduate Exit Interviews | Outcome/Objective: Knowledge of Manufacturing Processes

Implementation Description: A committee has been formed to review this item.
Projected Completion Date: 10/2012
Responsible Person/Group: The committee consist of Dr. Steve Shepard (Chair), Dr. Dan Fonseca, and Dr. Yuebin Guo.
Detailed Assessment Report
2011-2012 Mechanical Engineering B.S.M.E.
As of: 7/16/2014 10:38 AM CENTRAL

Mission / Purpose

Our mission, as aligned with the university, college, and department vision, is teaching, research, and service. The Department of Mechanical Engineering will: 1. Provide high-quality undergraduate, graduate, and continuing education in mechanical engineering that will prepare our graduates for professional careers and a lifetime of learning; 2. Conduct high-quality research programs that support the undergraduate and graduate education objectives, assist in economic development of the state and nation, and advance the general state of knowledge; 3. Serve individual practicing engineers, industry, government, educational entities, and technical societies through active involvement with these groups and by providing professional expertise; and 4. Ensure that our students are well educated technically, have some practical training, and have actively participated in professional society activities.

Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Knowledge of Math, Sci, Eng
(Discipline Knowledge) An ability to apply knowledge of mathematics, science, and engineering

Connected Documents
- Mechanical engineering bachelors Curriculum Map I
- Mechanical engineering bachelors Curriculum Map II

Related Measures

M 1: FE Math, Sci, Eng, morning pass rate
Achieve a pass rate of greater than 85% of the national average on the morning portion of the Fundamentals of Engineering Exam.

Source of Evidence: Academic direct measure of learning - other

Target:
Pass rate > 85% of national average

Finding (2011-2012) - Target: Met
Pass rate was 99.7% of the national average. Target was met.

M 2: Co-op Survey Math, Sci, Eng
Achieve average scores on questions 14, 15, and 16 of the Co-op Employer Survey of greater than 1.9/3.0.

Source of Evidence: Academic direct measure of learning - other

Target:
Average scores > 1.9/3.0

Finding (2011-2012) - Target: Met
Score was 2.24/3.0. Target was met.

M 3: ME 489 rubric apply ME knowledge
Achieve average scores on item “a” of the ME 489 assessment rubric greater than 7/10.

Source of Evidence: Academic direct measure of learning - other

Target:
score on item a > 7

Finding (2011-2012) - Target: Met
Score was 8.6/9.0. Target was met.

M 4: ME 490 rubric apply ME knowledge
Achieve average scores on item “a” of the ME 490 assessment rubric greater than 3/5.

Source of Evidence: Faculty pre-test / post-test of knowledge mastery

Target:
Score in Item a > 3/5

Finding (2011-2012) - Target: Met
Score was 4.1/5. Target was met.

SLO 2: Experimental ability
(Skills/Abilities) An ability to design and conduct experiments, as well as to analyze and interpret data

Connected Documents
- Mechanical engineering bachelors Curriculum Map I
- Mechanical engineering bachelors Curriculum Map II

Related Measures

M 5: Co-op Survey experiments
Achieve average scores on questions 20 and 21 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other

Target:
Average of questions 20 and 21 > 1.9/3

Finding (2011-2012) - Target: Met
Score 2.24/3. Target was met.

M 6: Student work in ME 360 and 460
Achieve average scores greater than 2/3 by department assessment committee of student work in the laboratory courses ME 360 and ME 460

Source of Evidence: Academic direct measure of learning - other

Target:
assessment committee score of > 2/3

Finding (2011-2012) - Target: Met
Score for ME 360 was 2.7/3.0; score for ME 460 was 2.7/3.0. Target was fully met.

SLO 3: Ability to design a system
An ability to design a system, component, or process to meet desired needs

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 7: Co-op survey design
Achieve average scores on question 22 of the Co-op Employer Survey of greater than 1.9/3.0.

Source of Evidence: Academic direct measure of learning - other

Target:
score > 1.9/3 on question 22

Finding (2011-2012) - Target: Met
Score was 2.45/3.0. Target was met.

M 8: ME 489 rubric design
Achieve average scores on item "c" of the ME 489 assessment rubric greater than 7/10.

Source of Evidence: Academic direct measure of learning - other

Target:
score > 7/10

Finding (2011-2012) - Target: Met
Score was 7.2/10. Target was met.

M 9: ME 490 rubric design
Achieve average scores on item "c" of the ME 490 assessment rubric greater than 3/5.

Source of Evidence: Academic direct measure of learning - other

Target:
score > 3/5

Finding (2011-2012) - Target: Met
Score was 4.1/5.0. Target was met.

SLO 4: Multi-disciplinary teams
An ability to function on multi-disciplinary teams

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 10: Co-op survey teams
Achieve average scores on question 10 of the Co-op Employer Survey of greater than 1.9/3.0.

Source of Evidence: Academic direct measure of learning - other

Target:
score > 1.9/3

Finding (2011-2012) - Target: Met
Score was 2.36/3.0. Target was met.

M 11: ME 489 rubric teams
Achieve average scores on item "d" of the ME 489 assessment rubric greater than 7/10.

Source of Evidence: Academic direct measure of learning - other

Target:
score > 7/10

Finding (2011-2012) - Target: Met
Score was 10/10. Target was met.

M 12: ME 490 rubric teams
Achieve average scores on item "d" of the ME 490 assessment rubric greater than 3/5.

Source of Evidence: Academic direct measure of learning - other
Target:
score > 3/5

Finding (2011-2012) - Target: Met
Score was 4.5/5.0. Target was met.

SLO 5: Identify, formulate, and solve engineering problems
An ability to identify, formulate, and solve engineering problems

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 13: Co-op Survey engineering problem solving
Achieve average scores on questions 18 and 19 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
score > 1.9/3

Finding (2011-2012) - Target: Met
Score was 2.3/3. Target was met.

M 14: ME 489 rubric problem solving
Achieve average scores on item “e” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
>7/10

Finding (2011-2012) - Target: Met
Score was 8.8/10. Target was met.

M 15: ME 490 rubric problem solving
Achieve average scores on item “e” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
>3/5

Finding (2011-2012) - Target: Met
Score was 4.1/5. Target was met.

SLO 6: Professional and ethical responsibility
An understanding of professional and ethical responsibility

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 16: Co-op survey ethics
Achieve average scores on question 11 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
>1.9/3

Finding (2011-2012) - Target: Met
Score was 2.3/3. Target was met.

M 17: ME 489 rubric ethics
Achieve average scores on item “f” of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other

Target:
>7/10

Finding (2011-2012) - Target: Met
Score was 9.15/10. Target was met.

M 18: ME 490 rubric ethics
Achieve average scores on item “f” of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other

Target:
>3/5

Finding (2011-2012) - Target: Met
Score was 4.29/5. Target was met.

SLO 7: Communicate effectively
An ability to communicate effectively

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures
M 19: Writing score in ME 360 and ME 460
Average of the writing score by English Department consultant on lab reports for ME 360 and ME 460 greater than 80/100
Source of Evidence: Writing exam to assure certain proficiency level
Target:
>80%
Finding (2011-2012) - Target: Met
Score was 85%. Target was met.

M 20: Co-op Survey Communication
Achieve average scores on questions 12 and 13 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other
Target:
>1.9/3
Finding (2011-2012) - Target: Met
Score was 2.3/3. Target was met.

M 21: ME 490 rubric communication
Achieve average scores on item "g" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
>3/5
Finding (2011-2012) - Target: Met
Score was 4.29/5. Target was met.

SLO 8: Global and societal context
The broad education necessary to understand the impact of engineering solutions in a global and societal context
Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 22: Senior Exit global and societal
Average scores of 3.5/5 on question 15 of the department Senior Exit Survey
Source of Evidence: Academic direct measure of learning - other
Target:
>3.5/5
Finding (2011-2012) - Target: Met
Score was 4.15/5. Target was met.

M 23: ME 490 global and societal
Achieve average scores on item "h" of the ME 490 assessment rubric greater than 3/5
Source of Evidence: Academic direct measure of learning - other
Target:
>3/5
Finding (2011-2012) - Target: Met
Score was 4.13/5. Target was met.

SLO 9: Engage in life-long learning
A recognition of the need for and an ability to engage in life-long learning
Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 24: ME 489 lifelong learning
Achieve average scores on item "i" of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other
Target:
> 7/10
Finding (2011-2012) - Target: Met
Score was 9.5/10. Target was met.

M 25: ME 490 lifelong learning
Achieve average scores on item "i" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other
Target:
> 3/5
Finding (2011-2012) - Target: Met
Score was 4.13/5. Target was met.

SLO 10: Contemporary issues
A knowledge of contemporary issues
Connected Documents
Related Measures

**M 26: Co-op Survey contemporary issues**
Achieve average scores on question 17 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other

Target:
>1.9/3

Finding (2011-2012) - Target: Met
Score 2.25/3. Target met.

**M 27: ME 490 contemporary issues**
Achieve average scores on item "j" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other

Target:
> 3/5

Finding (2011-2012) - Target: Met
Score was 4.135/5. Target was met.

**SLO 11: Techniques, skills, and modern eng. tools**
An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

**M 28: Co-op Survey modern skills and tools**
Achieve average scores on question 23 of the Co-op Employer Survey of greater than 1.9/3.0.
Source of Evidence: Academic direct measure of learning - other

Target:
>1.9/3

Finding (2011-2012) - Target: Met
Score was 2.43/3. Target was met.

**M 29: ME 489 modern skills and tools**
Achieve average scores on item "k" of the ME 489 assessment rubric greater than 7/10.
Source of Evidence: Academic direct measure of learning - other

Target:
>7/10

Finding (2011-2012) - Target: Met
Score was 8.8/10. Target was met.

**M 30: ME 490 modern skills and tools**
Achieve average scores on item "k" of the ME 490 assessment rubric greater than 3/5.
Source of Evidence: Academic direct measure of learning - other

Target:
>3/5

Finding (2011-2012) - Target: Met
Score was 4.23/5. Target was met.

**SLO 12: Thermal and mechanical systems**
The ability to work professionally in both thermal systems and mechanical systems

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

**M 31: Student work 407 and 415**
Score greater than 2/3 on department Assessment Committee review of Student Work in ME 407 and ME 415
Source of Evidence: Academic direct measure of learning - other

Target:
> 2/3

Finding (2011-2012) - Target: Met
Score of 2.5/3. Target was met.

**M 32: Student work in ME 450**
Score greater than 2/3 on department Assessment Committee review of Student Work in ME 450
Source of Evidence: Academic direct measure of learning - other

Target:
>2/3

Finding (2011-2012) - Target: Met
Score of 2.5/3. Target was met.

Other Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

OthOtcm 13: Knowledge of Manufacturing Processes
Graduates will demonstrate knowledge of conventional and modern manufacturing methods and materials.

Related Measures

M 40: Student work in ME 383
Assessment Committee review of student work portfolio from ME 383 will score greater that 3/5 with 3 being satisfactory and 5 being excellent.
Source of Evidence: Academic direct measure of learning - other

Target:
Score of 3/5 or better on committee assessment of work portfolio.

Finding (2011-2012) - Target: Met
Score of 4.5/5. Target met.

M 41: ME 490 Assessment Rubric
Students will score greater than 3/5 on ME 490 Assessment rubric.
Source of Evidence: Capstone course assignments measuring mastery

Target:
Score > 3/5 on ME 490 assessment rubric

Finding (2011-2012) - Target: Met
Score of 4.37/5.

M 42: Graduate Exit Interviews
Students will express satisfaction with their knowledge of manufacturing in the exit interviews.
Source of Evidence: Student satisfaction survey at end of the program

Target:
Students will express satisfaction with their manufacturing knowledge.

Finding (2011-2012) - Target: Partially Met
Students expressed several concerns with this course in the exit interviews. One concern was that their knowledge was all theoretical and not practical enough. Second was that there was too much repetition between the materials course MTE 271 and the manufacturing course ME 383.

Related Action Plans (by Established cycle, then alpha):

Ad Hoc Committee to review the manufacturing content of the ME Curriculum
Established in Cycle: 2011-2012
Some weakness in outcome 13, knowledge of manufacturing practices, was identified in the exit interviews with graduates. This...

For full information, see the Details of Action Plans section of this report.

OthOtcm 14: Recognized quality
The program will improve and sustain a high level of recognized quality.

Connected Documents
Mechanical engineering bachelors Curriculum Map I
Mechanical engineering bachelors Curriculum Map II

Related Measures

M 33: Maintain ABET assessment and accreditation
Conduct a detailed ABET assessment and maintain engineering accreditation
Source of Evidence: Academic indirect indicator of learning - other

Target:
remain accredited by ABET

Finding (2011-2012) - Target: Met
Program remains accredited by ABET. Next regular review cycle is 2013.

M 34: Passing rate on FE, GT, national average
Maintain a pass rate on the Fundamentals of Engineering Exam that is equal to are greater than the national average
Source of Evidence: Academic indirect indicator of learning - other

Target:
Greater than the national average

OthOtcm 15: Optimal level
The program will build and sustain an optimal level of annual program enrollments and degree completions.

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Target:
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M 36: University statistics on annual enrollments
University statistics on annual enrollments; achieve an undergraduate major enrollment of 600 to 650 students.
Source of Evidence: Academic indirect indicator of learning - other
Target:
650 students including freshmen

OthOtcn 16: Program value
The program will be highly valued by its program graduates and other key constituencies it serves.

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Mechanical engineering bachelors Curriculum Map II

Related Measures
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Data from Cooperative Education Employer Survey on the preparation of our students
Source of Evidence: Academic indirect indicator of learning - other
Target:
85% employers will find graduate competence very strong or strong

Details of Action Plans for This Cycle (by Established cycle, then alpha)

Ad Hoc Committee to review the manufacturing content of the ME Curriculum
Some weakness in outcome 13, knowledge of manufacturing practices, was identified in the exit interviews with graduates. This has been a continuing theme over the last few years. The source of the weakness appears to come from a perceived lack of practical aspects of manufacturing in the course ME 383 and a perceived excess of repetition of material from the prerequisite course MTE 271, Engineering Materials. An ad hoc committee of ME faculty with a majority of members who are familiar with manufacturing processes will be formed to work with the instructor of record of ME 383 and the mechanical systems faculty to review the manufacturing processes content of the curriculum and to recommend to the faculty any corrective actions needed.

Established in Cycle: 2011-2012
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: Graduate Exit Interviews | Outcome/Objective: Knowledge of Manufacturing Processes
Implementation Description: A committee has been formed to review this item.
Projected Completion Date: 10/2012
Responsible Person/Group: The committee consist of Dr. Steve Shepard (Chair), Dr. Dan Fonseca, and Dr. Yuebin Guo.
## Curriculum Map I (Student Learning Outcomes)

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*o*—student learning outcome is impacted by this course  
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