University of New Orleans

Detailed Assessment Report
2013-14 Mechanical Engineering, B.S.
As of: 7/05/2014 06:27 PM CDT
(Includes those Action Plans with Budget Amounts marked One-Time, Recurring, No Request.)

Mission / Purpose
The department has a goal of producing well-educated mechanical engineers, who will be successfully employed at the regional and national levels, or who will continue on with graduate studies. In particular the department's goal is to supply the greater New Orleans area, the state of Louisiana, and the region with competent mechanical engineers, while addressing the special needs of the oil (onshore and offshore), petrochemical/process, aerospace, and manufacturing industries. In support of the urban mission of the University, the undergraduate program has particular emphasis on serving non-traditional as well as traditional students. The department of mechanical engineering will fully employ emerging technologies in the classroom and research settings, will establish bilateral relationships with industry, and will foster personal discovery. The department will continue its commitment to scholarship and research and the development of graduate programs.

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

SLO 1: Knowledge of math, science & engineering
Graduates will demonstrate an ability to apply knowledge of mathematics, science and engineering

Connected Document
CID Outcome 1

Related Measures

M 1: AM section
FE scores in Math/Science/Engineering topics – AM section.
Source of Evidence: Standardized test of subject matter knowledge
Target: 80% will achieve a passing score.

Finding (2013-14) - Target: Not Met
63% pass rate on most 2013 results. National pass rate ~ 80%. We require every student to take exam. Therefore being near the national average is considered positive. 63% vs. 80% is below expectations. More detailed analysis using departmental rubrics attached.

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

Monitor FE results in Mechanics of Materials
An action item from the Spring 2012 assessment cycle was to monitor performance on the FE exam in Mechanics of Materials to determine whether decreased FE scores continue.

Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: Medium

Relationships (Measure | Outcome/Objective):
- Measure: Alumni/Industry surveys
- Outcome/Objective: Knowledge of math, science & engineering

Implementation Description: Topic-specific analysis of FE results is standard part of program assessment process for this outcome
Projected Completion Date: 05/2014
Responsible Person/Group: Outcomes Committee
Additional Resources: -

Review possible course-specific prerequisites
The program had previously implemented a blanket requirement for C or better grades in all Math and Physics courses. This was eliminated after the Spring 2012 review cycle due to logistical problems with implementation. Instead, the possible implementation of course-specific prerequisites (e.g. C or better in Math 2112 for ENME 2750) was put under review.

Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: Medium

Relationships (Measure | Outcome/Objective):
- Measure: Alumni/Industry surveys
- Outcome/Objective: Knowledge of math, science & engineering

Implementation Description: Evaluation of student performance in individual courses will be evaluated in the context of preparation in math and physics. Topic-specific analysis of FE exam results will be used to assess shortcomings.
Projected Completion Date: 12/2014
Responsible Person/Group: Outcomes Committee
Additional Resources: -
M 5: Alumni/Industry surveys
Alumni/Industry surveys are performed biannually and include rating UNO ME graduates' abilities related to each outcome on a scale of 1-5.

Source of Evidence: Alumni survey or tracking of alumni achievements

Target:
80% will score at level of "Criteria Exceeded" (4 of 5) or above.

Finding (2013-14) - Target: Met
92% of alumni rated at 4 or above. 87.5% of industry representatives rated at 4 or above.

Related Action Plans (by Established cycle, then alpha):
Monitor FE results in Mechanics of Materials
An action item from the Spring 2012 assessment cycle was to monitor performance on the FE exam in Mechanics of Materials to determine whether decreased FE scores continue.

Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: Medium

Relationships (Measure | Outcome/Objective):
Measure: Alumni/Industry surveys | Outcome/Objective: Knowledge of math, science & engineering
Measure: AM section | Outcome/Objective: Knowledge of math, science & engineering

Implementation Description: Topic-specific analysis of FE results is standard part of program assessment process for this outcome
Projected Completion Date: 05/2014
Responsible Person/Group: Outcomes Committee
Additional Resources: -

Review possible course-specific prerequisites
The program had previously implemented a blanket requirement for C or better grades in all Math and Physics courses. This was eliminated after the Spring 2012 review cycle due to logistical problems with implementation. Instead, the possible implementation of course-specific prerequisites (e.g. C or better in Math 2112 for ENME 2750) was put under review.

Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: Medium

Relationships (Measure | Outcome/Objective):
Measure: Alumni/Industry surveys | Outcome/Objective: Knowledge of math, science & engineering
Measure: AM section | Outcome/Objective: Knowledge of math, science & engineering

Implementation Description: Evaluation of student performance in individual courses will be evaluated in the context of preparation in math and physics. Topic-specific analysis of FE exam results will be used to assess shortcomings.
Projected Completion Date: 12/2014
Responsible Person/Group: Course coordinator for each required ENME course; final assessment by Outcomes Committee
Additional Resources: -

SLO 2: Experiments & analyze data
Graduates will demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data

Connected Document
CID Outcome 2

Related Measures

M 2: Assessment of ability
Assessment of ability using outcome specific departmental rubrics applied to assignments in ENME 3716 (O.2) and ENME 3780 (O.5).

Source of Evidence: Academic direct measure of learning - other

Target:
80% will score at “Criteria Met” or above on the rubric.

Finding (2013-14) - Target: Met
96% scored at "acceptable" or above. The ability is assessed by rating laboratory reports in ENME 3716 Fluid Mechanics Laboratory. The most recent results (Spring 2012) are attached.

Connected Document
Rubric Outcome 2

Related Action Plans (by Established cycle, then alpha):
Improve ENME 2711
The summative assessment indicates the students are demonstrating abilities at a level warranting a rating of 4 – criteria exceeded. However, the formative assessment, including review of content in all lab courses, indicates that the course content and student requirements ENME 2711 require improvement. Based on action items in the 2012 assessment cycle, a review of ENME 2711 was be performed. Potential improvements including new equipment, new lab manuals, etc. were recommended. The laboratory has been changed to also support ENME 2785 Manufacturing (Catalog description and pre-requisites changed, effective Fall 2012). Lab manuals have been rewritten, but changes are still in progress.

Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: High
M 5: Alumni/Industry surveys
Alumni/Industry surveys are performed biannually and include rating UNO ME graduates’ abilities related to each outcome on a scale of 1-5.
Source of Evidence: Alumni survey or tracking of alumni achievements
Target: 80% will score at level of “Criteria Exceeded” (4 of 5) or above.
Finding (2013-14) - Target: Partially Met
84% of alumni rated at 4 or above. 75% of industry representatives rated at 4 or above.
Related Action Plans (by Established cycle, then alpha):
 Improve ENME 2711
The summative assessment indicates the students are demonstrating abilities at a level warranting a rating of 4 – criteria exceeded. However, the formative assessment, including review of content in all lab courses, indicates that the course content and student requirements ENME 2711 require improvement. Based on evidence from the 2012 assessment cycle, a review of ENME 2711 was be performed. Potential improvements including new equipment, new lab manuals, etc. were recommended. The laboratory has been changed to also support ENME 2785 Manufacturing (Catalog description and pre-requisites changed, effective Fall 2012). Lab manuals have been rewritten, but changes are still in progress.
Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: High

SLO 3: Design a system or process
Graduates will demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
Connected Document CID Outcome 3

Related Measures
M 3: Design jury assessment
Capstone project design jury assessment using a departmental rubric.
Source of Evidence: Capstone course assignments measuring mastery
Target: 80% will achieve a score of “Criteria Met” or above.
Finding (2013-14) - Target: Met
80% scored at "Criteria Met" or above. The ability is assessed by having an external design jury rate capstone design projects in ENME 3733 Machine Design. The most recent results are attached.
Connected Document Rubric Outcome 3

Related Action Plans (by Established cycle, then alpha):
Review design sequence
The design sequence, which includes capstone design courses and 'secondary' design courses is continuously reviewed. A specific action item from the 2012 assessment cycle was to consider additional design project(s) for ENME 1781, the introductory design course.
Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: Medium

Relationships (Measure | Outcome/Objective):
Measure: Alumni/Industry surveys | Outcome/Objective: Design a system or process
Measure: Design jury assessment | Outcome/Objective: Design a system or process
Implementation Description: Course content in ENME 1781 is being reviewed by the Outcomes committee. Data in the ABET course binders (which include examples of all student work) are being used for the assessment.

Projected Completion Date: 05/2014

Responsible Person/Group: Outcomes Committee

Additional Resources:

M 5: Alumni/Industry surveys
Alumni/Industry surveys are performed biannually and include rating UNO ME graduates’ abilities related to each outcome on a scale of 1-5.

Source of Evidence: Alumni survey or tracking of alumni achievements

Target:
80% will score at level of “Criteria Exceeded” (4 of 5) or above.

Finding (2013-14) - Target: Not Met
76% of alumni rated at 4 or above. 38% of industry representatives rated at 4 or above.

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

Review design sequence
The design sequence, which includes capstone design courses and ‘secondary’ design courses is continuously reviewed. A specific action item from the 2012 assessment cycle was to consider additional design project(s) for ENME 1781, the introductory design course.

Established in Cycle: 2013-14

Implementation Status: In-Progress

Priority: Medium

Relationships (Measure | Outcome/Objective):

Measure: Alumni/Industry surveys | Outcome/Objective: Design a system or process

M 4: PM section
FE scores in Engineering topics – PM section.

Source of Evidence: Standardized test of subject matter knowledge

Target:
80% will achieve a score above (~.5σ) of national average

Finding (2013-14) - Target: Not Met
63% pass rate on most 2013 results. National pass rate ~ 80%. We require every student to take exam. Therefore being near the national average is considered positive. 63% vs. 80% is below expectations. More detailed analysis using departmental rubrics attached.

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

Perform topic-specific evaluation of FE results
Topic-specific evaluation of FE results is a regular part of the ABET assessment process. This is done on a 2-year cycle. The last evaluation in Spring 2012 called for no action; results were very good. The pass rate observed in 2013 is below expectations. The full evaluation should be performed in Spring 2014.

Established in Cycle: 2013-14

Implementation Status: Planned

Priority: High

Relationships (Measure | Outcome/Objective):

Measure: Alumni/Industry surveys | Outcome/Objective: Identify, formulate, and solve

M 5: Alumni/Industry surveys
Alumni/Industry surveys are performed biannually and include rating UNO ME graduates’ abilities related to each outcome on a scale of 1-5.

Source of Evidence: Alumni survey or tracking of alumni achievements

Target:
80% will score at level of “Criteria Exceeded” (4 of 5) or above.

Finding (2013-14) - Target: Partially Met
92% of alumni rated at 4 or above. 75% of industry representatives rated at 4 or above.

Related Action Plans (by Established cycle, then alpha):
Perform topic-specific evaluatin of FE results

Topic-specific evaluation of FE results is a regular part of the ABET assessment process. This is done on a 2-year cycle. The last evaluation in Spring 2012 called for not action; results were very good. The pass rate observed in 2013 is below expectations. The full evaluation should be performed in Spring 2014.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
- Measure: Alumni/Industry surveys | Outcome/Objective: Identify, formulate, and solve
- Measure: PM section | Outcome/Objective: Identify, formulate, and solve

Implementation Description: Perform topic-specific evaluation to identify areas for improvement
Projected Completion Date: 05/2014
Responsible Person/Group: Outcomes Committee
Additional Resources: -

SLO 5: Techniques, skills, and modern engineering tools
Graduates will demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Connected Document
CID Outcome 5

Related Measures

M 2: Assessment of ability
Assessment of ability using outcome specific departmental rubrics applied to assignments in ENME 3716 (O.2) and ENME 3780 (O.5).
Source of Evidence: Academic direct measure of learning - other

Target:
80% will score at “Criteria Met” or above on the rubric.

Finding (2013-14) - Target: Met
93% scored at "acceptable" or above. The ability is assessed by rating CAD/FEA problem on the Final Exam in ENME 3785 Introduction to Computational Solid Mechanics. Recent results are attached.

Connected Document
Rubric Outcome 5

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

Monitor use of computational tools in capstone design projects
During the Spring 2012 assessment cycle, a curriculum change was made requiring all students take either ENME 3780 Computational Solid Mechanics or ENME 4728 Computational Fluid Mechanics. These courses include introduction to the finite element methods and use of commercial software for advanced engineering analysis. The impact of this change should be monitored. Capstone design projects in ENME 3733 and 3773 will be monitored for increased use of these computational tools.
Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Medium

Relationships (Measure | Outcome/Objective):
- Measure: Alumni/Industry surveys | Outcome/Objective: Techniques, skills, and modern engineering tools
- Measure: Assessment of ability | Outcome/Objective: Techniques, skills, and modern engineering tools

Implementation Description: Instructors for 3733 and 3773 will monitor the use of computational tools in design projects. Data on the number of students incorporating computational tools in the analysis and the level of analysis will be documented in the ABET course binders for review. The expectation is that computational content will increase.
Projected Completion Date: 05/2014
Responsible Person/Group: Outcomes Committee
Additional Resources: -

M 5: Alumni/Industry surveys
Alumni/Industry surveys are performed biannually and include rating UNO ME graduates’ abilities related to each outcome on a scale of 1-5.
Source of Evidence: Alumni survey or tracking of alumni achievements

Target:
80% will score at level of "Criteria Exceeded" (4 of 5) or above.

Finding (2013-14) - Target: Partially Met
76% of alumni rated at 4 or above. 88% of industry representatives rated at 4 or above.

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

Monitor use of computational tools in capstone design projects
During the Spring 2012 assessment cycle, a curriculum change was made requiring all students take either ENME 3780 Computational Solid Mechanics or ENME 4728 Computational Fluid Mechanics. These courses include introduction to the finite element methods and use of commercial software for advanced engineering analysis. The impact of this change should be monitored. Capstone design projects in ENME 3733 and 3773 will be monitored for increased use of these computational tools.
Established in Cycle: 2013-14
Implementation Status: Planned
Details of Action Plans for This Cycle (by Established cycle, then alpha)

**Improve ENME 2711**

The summative assessment indicates the students are demonstrating abilities at a level warranting a rating of 4 — criteria exceeded. However, the formative assessment, including review of content in all lab courses, indicates that the course content and student requirements ENME 2711 require improvement. Based on action items in the 2012 assessment cycle, a review of ENME 2711 was be performed. Potential improvements including new equipment, new lab manuals, etc. were recommended. The laboratory has been changed to also support ENME 2785 Manufacturing (Catalog description and pre-requisites changed, effective Fall 2012). Lab manuals have been rewritten, but changes are still in progress.

Established in Cycle: 2013-14
Implementation Status: In-Progress
Priority: High

**Monitor FE results in Mechanics of Materials**

An action item from the Spring 2012 assessment cycle was to monitor performance on the FE exam in Mechanics of Materials to determine whether decreased FE scores continue.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Medium

**Monitor use of computational tools in capstone design projects**

During the Spring 2012 assessment cycle, a curriculum change was made requiring all students take either ENME 3780 Computational Solid Mechanics or ENME 4728 Computational Fluid Mechanics. These courses include introduction to the finite element methods and use of commercial software for advanced engineering analysis. The impact of this change should be monitored. Capstone design projects in ENME 3733 and 3777 will be monitored for increased use of these computational tools.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Medium

**Perform topic-specific evaluation of FE results**

Topic-specific evaluation of FE results is a regular part of the ABET assessment process. This is done on a 2-year cycle. The last evaluation in Spring 2012 called for not action; results were very good. The pass rate observed in 2013 is below expectations. The full evaluation should be performed in Spring 2014.

Established in Cycle: 2013-14
Implementation Status: Planned
**Priority:** High

**Relationships (Measure | Outcome/Objective):**
- **Measure:** Alumni/Industry surveys  
  **Outcome/Objective:** Identify, formulate, and solve
- **Measure:** PM section  
  **Outcome/Objective:** Identify, formulate, and solve

**Implementation Description:** Perform topic-specific evaluation to identify areas for improvement

**Projected Completion Date:** 05/2014

**Responsible Person/Group:** Outcomes Committee

**Additional Resources:** -

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**Review design sequence**

The design sequence, which includes capstone design courses and ‘secondary’ design courses is continuously reviewed. A specific action item from the 2012 assessment cycle was to consider additional design project(s) for ENME 1781, the introductory design course.

**Established in Cycle:** 2013-14

**Implementation Status:** In-Progress

**Priority:** Medium

**Relationships (Measure | Outcome/Objective):**
- **Measure:** Alumni/Industry surveys  
  **Outcome/Objective:** Design a system or process
- **Measure:** Design jury assessment  
  **Outcome/Objective:** Design a system or process

**Implementation Description:** Course content in ENME 1781 is being reviewed by the Outcomes committee. Data in the ABET course binders (which include examples of all student work) are being used for the assessment.

**Projected Completion Date:** 05/2014

**Responsible Person/Group:** Outcomes Committee

**Additional Resources:** -

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**Review possible course-specific prerequisites**

The program had previously implemented a blanket requirement for C or better grades in all Math and Physics courses. This was eliminated after the Spring 2012 review cycle due to logistical problems with implementation. Instead, the possible implementation of course-specific prerequisites (e.g. C or better in Math 2112 for ENME 2750) was put under review.

**Established in Cycle:** 2013-14

**Implementation Status:** In-Progress

**Priority:** Medium

**Relationships (Measure | Outcome/Objective):**
- **Measure:** Alumni/Industry surveys  
  **Outcome/Objective:** Knowledge of math, science & engineering
- **Measure:** AM section  
  **Outcome/Objective:** Knowledge of math, science & engineering

**Implementation Description:** Evaluation of student performance in individual courses will be evaluated in the context of preparation in math and physics. Topic-specific analysis of FE exam results will be used to assess shortcomings.

**Projected Completion Date:** 12/2014

**Responsible Person/Group:** Course coordinator for each required ENME course; final assessment by Outcomes Committee

**Additional Resources:** -