Detailed Assessment Report
2013-2014 Metallurgical Engr B.S.Met
As of: 7/16/2014 12:30 PM CENTRAL

Mission / Purpose

It is the mission of the Department of Metallurgical and Materials Engineering to provide excellence in teaching, research and service to the State of Alabama, the United States and the world as follows:

TEACHING: The Department will provide an outstanding education that balances theoretical and practical instruction for the design, analysis, and operation of materials systems. This will provide the state and the nation with outstanding engineers for scientific, technical, economic, and societal development. Students will excel in an environment that challenges and nurtures their potential, to become leaders in the global metallurgical and materials engineering community.

RESEARCH: The Department will conduct world class research in the field of metallurgical and materials engineering. The research will encompass both fundamental and applied knowledge in the areas of synthesis, processing, structure, properties, and performance of materials.

SERVICE: The Department will engage and serve society, industry, and the engineering profession through the promotion of and participation in activities that advance knowledge of metallurgy and materials for the benefit of society, the economy, and the environment.

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

SLO 4: Apply knowledge of math, science and engineering principles to metallurgical systems (ABET a)
Graduates will have the ability to apply knowledge of math, science and engineering principles to metallurgical systems.

Connected Document
Metallurgical BS Curriculum Map

Related Measures

M 7: Scorecard average score
Scorecard average score
Source of Evidence: Academic direct measure of learning - other

M 8: Alumni Survey responses
An annual or bi-annual alumni survey will provide information on the status of past graduates and their career. Data will be collected on professional society activities, research accomplishments, administrative accomplishments, publications, service to society, etc.
Source of Evidence: Alumni survey or tracking of alumni achievements

SLO 5: Design and conduct experiments (ABET b)
Demonstrate the ability to design and conduct experiments

Related Measures

M 7: Scorecard average score
Scorecard average score
Source of Evidence: Academic direct measure of learning - other

M 9: A comprehensive exit exam
A comprehensive exit exam is given to all graduating seniors to evaluate the level of skill in application of basic principles. It is expected that a minimum of 80% of students will score above 70%.
Source of Evidence: Faculty pre-test / post-test of knowledge mastery

SLO 6: Analyze and interpret data and prepare professional style engineering reports (ABET c)
Demonstrate the ability to analyze and interpret data and to prepare professional-style engineering reports

Related Measures

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**SLO 7: Function on multidisciplinary teams (ABET)**
Demonstrate the ability to function on multidisciplinary teams

**Relevant Associations:**
Demonstrate the ability to function on multidisciplinary teams

**Related Measures**

- **M 7: Scorecard average score**
  Scorecard average score
  Source of Evidence: Academic direct measure of learning - other

- **M 10: An exit interview is conducted**
  An exit interview is conducted with all graduating seniors to evaluate their impressions of the undergraduate experience and their opinion of likely success in a career – a measure of their confidence.
  Source of Evidence: Exit interviews with grads/program completers

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

**OthOtcm 1: Program Quality**
The program will improve and sustain a high level of recognized quality.

**Related Measures**

- **M 1: Student Average ACT Score**
  The number of metallurgical and materials engineering students admitted to the program with an ACT score above the UA average for entering freshmen
  Source of Evidence: Standardized test of subject matter knowledge

- **M 2: Student Admission Rate to Graduate Programs**
  The number of number of metallurgical and materials engineering graduates admitted to graduate or professional schools.
  Source of Evidence: Graduate/professional school acceptance rate

**OthOtcm 2: Program Optimal Enrollment**
The program will build and sustain an optimal level of annual program enrollments and degree completions.

**Connected Document**
Metallurgical BS Curriculum Map

**Related Measures**

- **M 3: Number of Majors**
  The number of students majoring in Metallurgical and Materials Engineering
  Source of Evidence: Academic indirect indicator of learning - other

- **M 4: Number of Degree Completions**
  The number of students majoring in Metallurgical and Materials Engineering
  Source of Evidence: Academic indirect indicator of learning - other

**OthOtcm 3: Program Highly Valued**
The program will be highly valued by its program graduates and other key constituencies it serves.

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Metallurgical BS Curriculum Map

**Related Measures**

- **M 5: Employment Rates**
  Employment Rates for Metallurgical and Materials engineering graduates reported by UA Career Center
  Source of Evidence: Administrative measure - other

- **M 6: Satisfaction by Graduating Seniors**
  Percentage of Senior Survey Respondents from Metallurgical and Materials Engineering reported being "Very Satisfied" with the Educational Experience at UA
  Source of Evidence: Administrative measure - other

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

**Curriculum changes to enhance student lab skills**
Based on scorecard averages to assess Student Learning Outcome “Design and Conduct Experiments”, the need to enhance student lab skills was a major point of discussion in several faculty meetings beginning in 2011. This resulted in faculty action in 2012. The Curriculum and Assessment Committees recommended to the faculty that one credit hour each be added to the Lab Courses (MTE 416, 441, 455 and 481). Justification is to increase lab training without sacrificing course content. This was approved by the faculty to go into effect Fall 2013.

**Established in Cycle:** 2012-2013
**Implementation Status**: Planned  
**Priority**: High  

**Relationships (Measure | Outcome/Objective):**  
**Measure**: Student Average ACT Score  
**Outcome/Objective**: Design and conduct experiments (ABET b)  

**Implementation Description**: The Curriculum and Assessment Committees recommended to the faculty that one credit hour each be added to the Lab Courses (MTE 416, 441, 455 and 481). This was approved by the faculty to go into effect Fall 2013.  
**Projected Completion Date**: 11/2012  
**Responsible Person/Group**: Assessment Coordinator and Department Head
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**Established in Cycle:** 2012-2013
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<thead>
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<th><strong>Implementation Status:</strong></th>
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<td><strong>Priority:</strong></td>
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<td><strong>Responsible Person/Group:</strong></td>
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University of Alabama

Detailed Assessment Report
2011-2012 Metallurgical Engr B.S.Met
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Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Produce graduates who have a strong foundation in mathematics, chemistry, and physics
Produce graduates who have a strong foundation in mathematics, chemistry, and physics with the ability to apply these skills in the solution of engineering problems.

Connected Document
Metallurgical BS Curriculum Map

Related Measures
M 1: Instructors for specified courses select an exam question
Instructors for specified courses select an exam question, homework, lab report, or other student work to evaluate on a scale of 1 to 5 using a given set of rubrics (see Additional Narrative at the end of this document). Rubrics are specified for each ABET learning outcome A to L. The goal of the department will be to achieve a score higher than 3 for each of the A to L outcomes.
Source of Evidence: Academic direct measure of learning - other

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

SLO 2: Produce graduates who communicate effectively in both oral and written methods
Produce graduates who communicate effectively in both oral and written methods in a wide variety of situations

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Metallurgical BS Curriculum Map

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SLO 3: Produce graduates who have the ability to succeed in the global engineering
Produce graduates who have the ability to succeed in the global engineering professional community.

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Metallurgical BS Curriculum Map

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## Curriculum Map I (Student Learning Outcomes)

<table>
<thead>
<tr>
<th>Course 1</th>
<th>MTE 275</th>
<th>Engr Matls Lab</th>
<th>Student Learning Outcome 1</th>
<th>Apply fundamental principles- A-D, F, K</th>
<th>Student Learning Outcome 2</th>
<th>Communicate Effectively- C,E,G,J</th>
<th>Student Learning Outcome 3</th>
<th>Succeed in global engineering community- C, E-J,L</th>
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<tbody>
<tr>
<td>Course 2</td>
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<td>Synthesis, Processing</td>
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<td></td>
<td>D</td>
<td></td>
<td>H</td>
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<tr>
<td>Course 3</td>
<td>MTE 353</td>
<td>Transport Phenomena</td>
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<td></td>
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<td>Course 4</td>
<td>MTE 362</td>
<td>Thermodynamics</td>
<td></td>
<td></td>
<td>A,K</td>
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<td>Course 5</td>
<td>MTE 373</td>
<td>Physical Metallurgy</td>
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<td>B,C,F</td>
<td>J</td>
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<td>Course 6</td>
<td>MTE 416</td>
<td>Foundry Processing</td>
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<td>Course 7</td>
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<td>Course 8</td>
<td>MTE 443</td>
<td>Capstone Design I</td>
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<td></td>
<td>B,D</td>
<td></td>
<td>J, L</td>
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<td>Course 9</td>
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<td>Capstone Design II</td>
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<td>H, I, J, L, M</td>
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<td>Course 10</td>
<td>MTE 455</td>
<td>Mechanical Behavior</td>
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<td>A, F,</td>
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<td>J</td>
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<tr>
<td>Course 11</td>
<td>MTE 481</td>
<td>Analytical Methods</td>
<td></td>
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<td>C, K</td>
<td>C, G</td>
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Curriculum Map II (Assessment Measures)

<table>
<thead>
<tr>
<th>Course</th>
<th>Student Learning Outcome 1</th>
<th>Student Learning Outcome 2</th>
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<td>Course 1</td>
<td>MTE 275 Engr Matls Lab</td>
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<td>MTE 380 Synthesis, Processing</td>
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<td>Course 3</td>
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<td>MTE 362 Thermodynamics</td>
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