2012-2013 Undergraduate Academic Assessment Plan

Materials Science and Engineering

College of Engineering

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Materials Science & Engineering, College of Engineering
Undergraduate Academic Assessment Plan

Mission Statement

The Department of Materials Science and Engineering seeks to develop tomorrow's leaders in materials and nuclear sciences and engineering through cutting-edge educational programs, to perform high-impact research that benefits society, and to serve the needs of the state and nation.

This mission is aligned with both the College of Engineering and university's mission. The college mission is:

The College of Engineering fosters and provides world-class programs in engineering education, research and service to enhance the economic and social well-being of the citizens of Florida, the nation and the world.

The university's mission states in part:

These three interlocking elements — teaching, research and scholarship, and service — span all the university's academic disciplines and represent the university's commitment to lead and serve the state of Florida, the nation and the world by pursuing and disseminating new knowledge while building upon the experiences of the past.

The department's mission promotes these missions through its call for research and education activities to serve the state and nation.

Student Learning Outcomes (SLOs)

Content Knowledge

1. Apply knowledge of mathematics, science and engineering principles to materials science and engineering.
2. Design and conduct materials science and engineering experiments and analyze and interpret the data.

Critical Thinking

3. Design a materials science and engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.

Communication

4. Communicate technical data and design information effectively in speech and in writing to other materials engineers.

Curriculum Map

Curriculum Map for: Materials Science & Engineering, College of Engineering

Key: **I**ntroduced **R**einforced **A**ssessed

Courses SLOs							Additional Assessments
Content Knowledge	EMA3050	EMA3066	EMA4714	EMA3080C	EMA3513C	EMA4714	
#1	I	R	A				Senior exit survey.
#2				I	R	A	Senior exit survey.
Critical Thinking	EMA3066	EMA4223	EMA4714				
#3	I	R	A				Senior exit survey.
Communication	EMA3080C	EMA3013C	EMA3513C				
#4	I	R	A				Senior exit survey.

Assessments in the boxes marked A are conducted using specific homework, exam, or assignment questions aligned with that SLO. See narrative below for further details.

Assessment Cycle

The assessment of SLOs is integrated with the assessment process that occurs under the engineering accreditation requirements of ABET. SLOs are assessed annually in the classes shown above. The cycle includes the following action items:

- Assessment of individual SLOs by the instructors of the courses.
- Review of assessment results by the department Curriculum Committee, which makes recommendations for improvement actions.
- Review by the department faculty and decision on recommendations from the Curriculum Committee.

Assessment Cycle Chart

Assessment Cycle for: Materials Science & Engineering, College of Engineering

Analysis and Interpretation:	Completed by August 31
Improvement Actions:	Completed by September 15
Dissemination:	Completed by September 30

Year / SLOs	10-11	11-12	12-13	13-14	14-15	15-16
Content Knowledge						
#1	X	X	X	X	X	X
#2	X	X	X	X	X	X
Critical Thinking						
#3	X	X	X	X	X	X
Communication						
#4	X	X	X	X	X	X

Methods and Procedures

SLO Assessment Matrix

2012-13 Student Learning Outcome	Assessment Method	Measurement Procedure
Apply knowledge of mathematics, science and engineering principles to materials science and engineering.	Specific homework, exam, or assignment questions; Senior exit survey	Outcome assessment form
Design and conduct materials science and engineering experiments and analyze and interpret the data.	Specific homework, exam, or assignment questions; Senior exit survey	Outcome assessment form
Design a materials science and engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.	Specific homework, exam, or assignment questions; Senior exit survey	Outcome assessment form
Communicate technical data and design information effectively in speech and in writing to other materials engineers.	Specific homework, exam, or assignment questions; Senior exit survey	Outcome assessment form

The techniques used to assess SLO performance are Outcome Assessment Forms and student exit interview. Outcome Assessment Forms provide direct assessment of student performance on outcomes. Outcomes are assessed through specific pre-determined exam questions, quizzes, homework problems, or other assignments that are identified as being specifically related to that outcome. While there is expected to be some correspondence between the outcome assessment and the grading of any particular problem or assignment, a student's overall grade on an exam or for a course does not necessarily correspond to overall performance on any particular outcome. The Outcome Assessment Form is shown on the next page.

The metric used to identify adequate achievement of an outcome is that 80% of the students receive a 3.0 or higher on the outcome assessment. The 3.0 score has been identified as the standard representing acceptable achievement of the outcome. The performance of 80% of the students at this level has been selected as a statistically representative sampling. While it is desirable to achieve 100% of the students at this level, this is unlikely in any single course. When considered across the entire curriculum, the 80% level provides reasonable assurance that any particular student has demonstrated adequate performance on each outcome at some point in the curriculum (even if it is in a course that is not part of the assessment plan). In this context it should be noted that very poor students who are unable to demonstrate adequate performance at all will do so poorly in the curriculum overall that they will not graduate from the program (either failing out or transferring to another program).

Department of Materials Science and Engineering
University of Florida
Outcome Assessment Form

Course Title:_____ **Instructor:**_____
Course Number:_____ **Semester:**_____
Assessed Outcome:

Method(s) of Assessment‡ *Check all that apply:*

☐ Quiz questions
☐ Exam questions
☐ Homework questions
☐ Lab report
☐ Research paper
☐ Oral presentation

☐ Other (specify) _____

Students are assessed on a scale of 1-5, with 1 indicating unsatisfactory performance, 3 indicating that performance meets expectations, and 5 indicating outstanding performance. Performance levels corresponding to each of these values are defined in the rubrics associated with this outcome. The target is that 80% of the students earn a minimum score of 3.

Changes in course made since last assessment (*if applicable*)

Results of assessment

Score	Number of students	Percentage of students
1.0-1.9		
2.0-2.9		
3.0-3.9		
4.0-4.9		
5.0		

Percentage of students scoring 3 or higher: _____
☐ Performance criterion was met.
☐ Performance criterion was not met.

Comparison between current assessment and last assessment results
Percentage of students scoring 3 or higher previous time course was taught: _____
☐ Performance criterion was met both times.
☐ Performance criterion was not met last time and has now been met. The changes made improved performance adequately.
☐ Performance criterion was not met. Further changes are needed to meet the performance criterion.

How will the results of assessment be used to make improvements?

Assessment questions used:

Assessment Oversight

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