

**Doctor of Philosophy
in Materials Science and
Engineering
Academic Assessment Plan
2012-2013**

Materials Science and
Engineering

College of Engineering

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Materials Science & Engineering

College of Engineering

Academic Assessment Plan – Ph.D. Degree

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. Identify unknown aspects of structure-property-processing relationships for a materials system and formulate an approach to elucidating those aspects using engineering and/or scientific principles at a level appropriate to a doctoral research.
2. Demonstrate proficiency on appropriate experimental or computational techniques used for materials characterization, and uses these techniques to investigate structure-property-relationships in material systems at a level appropriate to doctoral research.

Skills

3. Obtain information from primary literature and technical reports, and integrate that information to reach conclusions regarding the current state of the art and areas in which further research is needed.
4. Write and/or orally present the results of a research project or literature review in a manner that clearly communicates one or more of the following: current state of the art, areas in which additional research is needed, research objectives, procedures, results, and conclusions.

Professional Behavior

5. Write reports and research papers following ethical standards regarding appropriate citation and plagiarism.
6. Work cooperatively with others, interact with supervisors, follow guidelines for appropriate management of data, and follow safety requirements for working in a research laboratory.

Research

The Doctor of Philosophy degree requires completion of core coursework, oral defense of a written research proposal, independent research, and a doctoral dissertation. Students seeking the Ph.D. degree are prepared for research activities through exposure to research topics and approaches in required graduate courses and through formal laboratory instruction by research advisors and senior researchers. Professional development is formalized through required coursework addressing career related topics, through teaching assistantships, participation in professional societies, and attendance at local and national research meetings.

Assessment Timeline

Assessment Cycle for: Ph.D. in Materials Science and Engineering, College of Engineering

Assessment	Assessment 1	Assessment 2
SLOs		
Content Knowledge		
Structure –property relationships	Final Exams of EMA 6114 & EMA 6313	Oral Research Proposal Defense, Dissertation Defense
Experimental/computational proficiency	Dissertation Defense	
Skills		
Literature research/assessment of field	Oral Research Proposal Defense	Dissertation Defense
Technical presentation	Oral Research Proposal Defense	Dissertation Defense
Professional Behavior		
Technical writing/ethical reporting	Oral Research Proposal Defense	Dissertation Defense, Peer Reviewed Publications or Proceedings
Professional Interactions	Completion of Teaching Assistantship	Participation in Professional Research Conferences

Assessment Cycle

Assessment Cycle for: Ph.D. in Materials Science and Engineering, College of Engineering

Analysis and Interpretation:

May- June, ongoing at time of defense

Improvement Actions:

Completed by August 31

Dissemination:

Completed by September 30

SLOs	Year	10-11	11-12	12-13	13-14	14-15	15-16
Content Knowledge							
Structure –property relationships		X	X	X	X	X	X
Experimental/computational proficiency		X	X	X	X	X	X
Skills							
Literature research/assessment of field		X	X	X	X	X	X
Technical presentation		X	X	X	X	X	X
Professional Behavior							
Technical writing/ethical reporting		X	X	X	X	X	X
Professional Interactions				X	X	X	X

Measurement Tools

The techniques used to assess the knowledge objectives are measured through advanced-level courses faculty members who teach the courses. Likewise, the skills objectives are evaluated by MSE faculty instructors of the core and elective courses through individual assignments related to literature research and assessment of the current status of the MSE discipline. Technical presentation skills, technical writing abilities, as well as core and specialty competency are evaluated through the oral defense of a written research proposal. This evaluation is performed by a committee composed of five expert faculty familiar with the area of research, in turn composing the dissertation committee. The knowledge and skills learning objectives are also measured through an evaluation of the skills and capabilities demonstrated in the Doctor Dissertation defense. The rubric of this evaluation is included below. Professional interaction objectives are measured through teaching assistant evaluation forms, and by evaluations of teaching faculty and graduate research advisor at corresponding times during the path to degree.

Name _____ UFID _____

**PhD Dissertation
Graduate Student Learning Outcome Checklist**

Indicate if the student has successfully accomplished the following outcomes:

Student is able to identify unknown aspects of structure-property-processing relationships for a materials system and formulate an approach to elucidating those aspects using engineering and/or scientific principles at a level appropriate to doctoral research.

- ☐ Yes
☐ No

Student can obtain information from primary literature and technical reports, and can integrate that information to reach conclusions regarding the current state of the art and areas in which further research is needed.

- ☐ Yes
☐ No

Student demonstrates proficiency on appropriate experimental or computational techniques used for materials characterization, and uses these techniques to investigate structure-property-relationships in material systems at a level appropriate to doctoral research.

- ☐ Yes
☐ No

Student demonstrates an ability to work cooperatively with others, interact with supervisors, follow guidelines for appropriate management of data, and follow safety requirements for working in a research laboratory.

- ☐ Yes
☐ No

Student is able to follow requirements for writing reports and research papers, and does so based on ethical standards regarding appropriate citation and plagiarism.

- ☐ Yes
☐ No

Student is able to write and orally present the results of a research project in a manner that clearly communicates the project's objectives, procedures, results, and conclusions.

- ☐ Yes
☐ No

Date: _____

Supervisory Chair: _____
Name (Printed)

Signature

External Member: _____
Name (Printed)

Signature

Assessment Oversight

Name	Department Affiliation	Email Address	Phone Number
Scott S. Perry	MSE Associate Chair for Academics	ssp@mse.ufl.edu	6-3333
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