

# **2012-2013 Ph.D. in Mechanical Engineering Academic Assessment Plan**

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*University of  
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*Institutional  
Assessment*

*Continuous Quality  
Enhancement*

## Table of Contents

Academic Assessment Plan for Ph.D. in Mechanical Engineering.....	3
A. Mission .....	3
B. Student Learning Outcomes and Assessment Measures .....	4
C. Research.....	4
D. Assessment Timeline.....	5
E. Assessment Cycle .....	6
F. Measurement Tools.....	6
G. Assessment Oversight.....	8
Figure 1. University of Florida Graduate/Professional Program Assessment Plan Review Rubric.....	9
University of Florida Graduate/Professional Program Assessment Plan Review Rubric, continued.....	10

# Academic Assessment Plan for Ph.D. in Mechanical Engineering

College of Engineering

## A. Mission

The Mechanical & Aerospace Engineering department defines four objectives as the cornerstones of its mission. The first objective is naturally education. As an outstanding department in a top tier university, the department has an obligation to provide exceptional educational experiences to its students at the BS, MS, and PhD levels. Along these lines we are charged with the preparation of students in the mechanical and aerospace engineering fields for future leadership in industry, academia, and government. Our second objective is to conduct state-of-the-art basic and collaborative research towards advancing science and technology in mechanical engineering and aerospace engineering. Research is the lifeblood of any influential university. Thirdly we provide service to professional societies, our local community, and the state of Florida. With partnerships come great results and we keep this in the forefront of our activities as we partner with industry to address the needs of professional societies. Finally we profess our support of the college of engineering and the university in the fulfillment of their missions.

Our vision for fulfilling our mission is composed of the following:

- Attract, develop, and retain the best faculty and staff. Employing top people in our faculty and staff positions allow us to provide the educational experiences expected of our department. Faculty are the foundation of a strong department.
- Recruit and educate the best undergraduate and graduate students. A department without students is an empty house. Students perform research which advances the department and it is the achievements of students which reflect on the department when our students find success in the world.
- Conduct internationally recognized and well-funded fundamental & applied research. By performing research which is well-funded we ensure that our efforts coincide with relevant interests in the engineering community.
- Maintain state-of-the-art teaching and research facilities. Investing in our facilities allows us to fulfill our educational and research goals.

The mission statement of the program supports the college of engineering mission. Both explicitly seek to provide world-class programs in engineering education, research and service to the citizens of Florida and the nation. The mission statement for the program addresses the needs of the engineering profession which is consistent with the qualities of graduates cited in the college mission statement, i.e. vision, values, leadership and professional expertise.

The mission statement of this unit supports the university's mission statement by directly addressing the areas of teaching, research and scholarship, and service. The mission of the program is critically important to the mission of the university as a land-grant, sea-grant and space-grant research university.

## B. Student Learning Outcomes and Assessment Measures

SLO Type	SLO	Assessment Method	Delivery Mode
Knowledge	Ability to identify, formulate, and solve engineering problems. Ability to critically read and integrate engineering research literature	The outcome is assessed by the dissertation committee at the proposal stage and a second time at the final dissertation defense. Based on student performance the committee will assign a score based on the Likert scale: 1 (poor), 2 (fair), 3(good), 4(very good) and 5 (excellent). 100% of students in the class should exhibit 3 or above.	Campus
Skills	Ability to use applied mathematical and/or modern experimental techniques. Ability to use modern engineering tools for practice at an advanced level	The outcome is assessed by the dissertation committee at the proposal stage and a second time at the final dissertation defense. Based on student performance the committee will assign a score based on the Likert scale: 1 (poor), 2 (fair), 3(good), 4(very good) and 5 (excellent). 100% of students in the class should exhibit 3 or above.	Campus
Professional Behavior	Ability to communicate effectively	The outcome is assessed by the dissertation committee at the proposal stage and a second time at the final dissertation defense. Based on student performance the committee will assign a score based on the Likert scale: 1 (poor), 2 (fair), 3(good), 4(very good) and 5 (excellent). 100% of students in the class should exhibit 3 or above.	Campus

## C. Research

The MAE department expects our doctoral students to conduct state-of-the-art basic and collaborative research towards advancing science and technology in mechanical engineering and aerospace engineering. Coursework used toward the degree contributes to the academic knowledge, skills and professional behaviors needed for students to satisfy the research aspect of the degree program. The student's committee chairman has primary responsibility for mentoring the student and directing the research activities of the student. Formulating a dissertation or thesis proposal is an important requirement for the degree thru which the student learns to identify and plan a research program.

Accordingly, the MAE department utilizes the written dissertation/thesis proposal when evaluating the student learning outcomes. The final written dissertation and oral defense provide a second opportunity for assessment of the student learning outcomes.

### D. Assessment Timeline

Program: Ph.D. in Mechanical Engineering \_\_\_\_\_

College of Engineering \_\_\_\_\_

Assessment	Assessment 1	
<b>SLOs</b>		
<b>Knowledge</b>		
Ability to identify, formulate, and solve engineering problems. Ability to critically read and integrate engineering research literature	Dissertation Proposal	Dissertation Final Defense
<b>Skills</b>		
Ability to use applied mathematical and/or modern experimental techniques. Ability to use modern engineering tools for practice at an advanced level	Dissertation Proposal	Dissertation Final Defense
<b>Professional Behavior</b>		
Ability to communicate effectively	Dissertation Proposal	Dissertation Final Defense

## E. Assessment Cycle

Assessment Cycle for:

Program: Ph.D. in Mechanical Engineering College of Engineering \_\_\_\_\_

Analysis and Interpretation:

May-August

Program Modifications:

Completed by September 30

Dissemination:

Completed by October 31

SLOs	Year	10-11	11-12	12-13	13-14	14-15	15-16
<b>Content Knowledge</b>							
Ability to identify, formulate, and solve engineering problems. Ability to critically read and integrate engineering research literature			X	X	X	X	X
<b>Skills</b>							
Ability to use applied mathematical and/or modern experimental techniques. Ability to use modern engineering tools for practice at an advanced level			X	X	X	X	X
<b>Professional Behavior</b>							
Ability to communicate effectively			X	X	X	X	X

## F. Measurement Tools

### SLO 1:

#### *Knowledge*

Ability to identify, formulate and solve engineering problems

Ability to critically read and integrate engineering research literature

#### *Assessment Plan*

The both the dissertation proposal and final dissertation defense are important requirements for the PhD degree. The outcome is assessed by the dissertation committee at the proposal stage and a second time at the final dissertation defense.

#### *Rubric*

Based on student performance the committee will assign a score based on the Likert scale: 1 (poor), 2 (fair), 3(good), 4(very good) and 5 (excellent).

*Program Metric*

100% of students in the class should exhibit 3 or above

*Example Result*

During the 2011/2012 academic year fourteen (14) students made dissertation proposals. Seven (7) scored 5 (excellent), five (5) scored 4 (very good), and two (2) scored 3 (good).

**SLO 2:**

*Skills*

Ability to use applied mathematical and/or modern experimental techniques

Ability to use modern engineering tools for practice at an advance level

*Assessment Plan*

The both the dissertation proposal and final dissertation defense are important requirements for the PhD degree. The outcome is assessed by the dissertation committee at the proposal stage and a second time at the final dissertation defense.

*Rubric*

Based on student performance the committee will assign a score based on the Likert scale: 1 (poor), 2 (fair), 3(good), 4(very good) and 5 (excellent).

*Program Metric*

100% of students in the class should exhibit 3 or above

**SLO 3:**

*Professional experience*

Ability to communicate effectively

*Assessment Plan*

The both the dissertation proposal and final dissertation defense are important requirements for the PhD degree. The outcome is assessed by the dissertation committee at the proposal stage and a second time at the final dissertation defense.

*Rubric*

Based on student performance the committee will assign a score based on the Likert scale: 1 (poor), 2 (fair), 3(good), 4(very good) and 5 (excellent).

*Program Metric*

100% of students in the class should exhibit 3 or above

**G. Assessment Oversight**

Name	Department Affiliation	Email Address	Phone Number
Bruce Carroll	MAE	<a href="mailto:bfc@ufl.edu">bfc@ufl.edu</a>	352-262-8174
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## Figure 1. University of Florida Graduate/Professional Program Assessment Plan Review Rubric

Related resources are found at <http://www.ua.assessment.edu>

Program:		Year:			
Component	Criterion	Rating			Comments
		Met	Partially Met	Not Met	
<b>Mission Statement</b>	Mission statement is articulated clearly.				
	The program mission clearly supports the College and University missions, and includes specific statements describing how it supports these missions.				
<b>Student Learning Outcomes (SLOs) and Assessment Measures</b>	SLOs are stated clearly.				
	SLOs focus on demonstration of student learning.				
	SLOs are measurable.				
	Measurements are appropriate for the SLO.				
<b>Research</b>	Research expectations for the program are clear, concise, and appropriate for the discipline.				
<b>Assessment Map</b>	The Assessment Map indicates the times in the program where the SLOs are assessed and measured.				
	The Assessment Map identifies the assessments used for each SLO.				
<b>Assessment Cycle</b>	The assessment cycle is clear.				
	All student learning outcomes are measured.				
	Data is collected at least once in the cycle.				
	The cycle includes a date or time period for data analysis and interpretation.				
	The cycle includes a date for planning improvement actions based on the data analysis.				
	The cycle includes a date for dissemination of results to the appropriate stakeholders.				

University of Florida Graduate/Professional Program Assessment Plan Review Rubric, continued

Component	Criterion	Rating			Comments
		Met	Partially Met	Not Met	
<b>Measurement Tools</b>	Measurement tools are described clearly and concisely.				
	Measurements are appropriate for the SLOs.				
	Methods and procedures reflect an appropriate balance of direct and indirect methods.				
	The report presents examples of at least one measurement tool.				
<b>Assessment Oversight</b>	Appropriate personnel (coordinator, committee, etc.) charged with assessment responsibilities are identified				