Academic Program
Plan for Assessment of Student Learning Outcomes
The University of New Mexico

A. College, Department and Date

1. College: School of Engineering
2. Department: CE, ChNE, ECE, ME
3. Date: 30 August 2010

B. Academic Program of Study*

PhD in Engineering

C. Contact Person(s) for the Assessment Plan

Charles Fleddermann, Associate Dean

D. Broad Program Goals & Measurable Student Learning Outcomes

1. Broad Program Learning Goals for this Degree/Certificate Program

Graduates will successfully advance in their careers through:

1) Technical competence in their area of specialization;
2) Demonstration of research skills appropriate for an industrial or academic institution;
3) An ability to communicate research results in appropriate forums .

2. List of Student Learning Outcomes (SLOs) for this Degree/Certificate Program

Students receiving the PhD in Engineering will:

1) Exhibit knowledge of engineering and science fundamentals appropriate for the discipline and/or specialization.

2) Demonstrate a depth of knowledge in the specialization.

3) Have the ability to conduct independent and original research.

* Academic Program of Study is defined as an approved course of study leading to a certificate or degree reflected on a UNM transcript. A graduate-level program of study typically includes a capstone experience (e.g. thesis, dissertation, professional paper or project, comprehensive exam, etc.).

4) Have demonstrated the ability to perform a critical review of the literature in the area of specialization.

5) Be able to communicate effectively.

E. <u>Assessment of Student Learning Three-Year Plan</u>

All programs are expected to measure some outcomes annually and to measure all priority program outcomes at least once over two consecutive three-year review cycles. Describe below the plan for the next three years of assessment of program-level student learning outcomes.

<u>Relationship to UNM Student Learning Goals</u> (insert the program SLOs and check all that apply):

University of New Mexico Student Learning Goals				
Program SLOs	Knowledge	Skills	Responsibility	Program SLO is conceptually different from university goals.
1) Exhibit knowledge of engineering and science fundamentals appropriate for the discipline and/or specialization.	X			
2) Demonstrate a depth of knowledge in the specialization	X			
3) Have the ability to conduct independent and original research.		X		
4) Have demonstrated the ability to perform a critical review of the literature in the area of specialization.		X		
5) Be able to communicate effectively.		X		

2. How will learning outcomes be assessed?

A. <u>What</u>:

i. For students receiving a PhD from the School of Engineering, for all SLOs, the student's exam committee will assess whether the student has achieved the outcomes based on the student's dissertation and defense. This will be documented on a rubric that has been developed for this purpose, to be filled out by a consensus of the committee (rather than by each individual member of the committee). (Rubric is attached.)

ii. This is a direct measurement.

iii. No success criteria are used per standard nationwide engineering outcomes practice.

B. Who: Assessment will be performed on all students as they graduate from the program.

3. When will learning outcomes be assessed? When and in what forum will the results of the assessment be discussed?

Assessment takes place as each student defends his/her dissertation. Results of the outcomes assessment for each student will be evaluated by each department's graduate committee and/or faculty. The evaluations prepared by each departmental graduate committee will be reported to the SOE graduate committee for analysis, discussion, feedback, and any necessary action.

4. What is the unit's process to analyze/interpret assessment data and use results to improve student learning?

See response to question 3 above.

SOE PhD Outcomes Assessment Rubric

To be filled out by committee chair in consultation with exam committee.

Student: _____ Date: _____

Outcome	Unacceptable (0)	Marginal (1)	Acceptable (2)	Exceptional (3)	Rating
1) Knowledge of engineering/science fundamentals appropriate for discipline and specialization	No evidence of PhD level fundamental knowledge.	Rudimentary knowledge exhibited in written document and oral presentation.	Knowledge of fundamentals evident in written and oral presentation.	Demonstrates mastery of appropriate fundamentals for the discipline.	
2) Depth of knowledge in specialization	Only rudimentary knowledge in specialization.	Some knowledge of specialization evidenced.	Demonstrates appropriate level of knowledge in specialization.	Demonstrates knowledge of specialization comparable to experienced practitioner.	
3) Ability to conduct original research	No evidence of planning and execution of research program.	Some useful research results with some evidence of original work.	Carried out good research program, achieved useful and novel results.	Excellent planning and execution of research program. Excellent results	
4) Ability to perform critical review of literature in area of specialization	Rudimentary literature review.	Some review of the literature, but little critical evaluation.	Comprehensive review of literature with evidence of critical thinking about further needs for research in this area.	Extensive review of literature with critical evaluation comparable to a review article in literature.	
5) Able to communicate effectively	Dissertation/thesis poorly written. Oral exam not well planned or presented. Unable to answer questions.	Dissertation/thesis mostly clearly written. Presented main points clearly. Able to answer most questions.	Well written and well organized dissertation/thesis. Well organized and clear presentation. Good ability to answer questions.	Excellent job of writing and organizing dissertation/thesis. Well organized talk. Able to respond to questions and facilitate further discussion of results.	
Overall Assessment	**Unacceptable (1)**	**Marginal (2)**	**Acceptable (3)**	**Exceptional (4)**	

Comments:

What curricular or process changes can you suggest to improve student performance in these areas?