Mission / Purpose

The Doctor of Philosophy in Engineering and Applied Science is an interdisciplinary, integrative degree involving faculty from the College of Engineering and the College of Sciences. The program is designed for those engineers/scientists who will extend the frontiers of engineering/science. The graduate will have knowledge that is both broad in fundamentals as well as strongly focused in the area of his/her research. Research is the centerpiece of a Ph.D. program. It is expected that the graduate’s research will substantially expand the knowledge of the engineering/science profession.

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

SLO 1: Qualifying Procedures

Ability to apply basic engineering concepts as demonstrated by the results of the Qualifying Procedures

Related Measures

M 1: Results of the Qualifying Procedures
Requirements for admission to the program should be stringent enough as demonstrated by the results of the Qualifying Procedures

Source of Evidence: Academic direct measure of learning - other

Target:
85% of the students taking the Qualifying Examination will pass with a required grade of 80 or above. 100% of the students who pass the qualifying procedure will obtain the grade of at least 80 from a committee composed of the Dean, Associate Deans and Department Chairs.

Finding (2013-14) - Target: Partially Met
8 out of 8 students have passed the qualifying exam during summer and fall 2013. 100% of the students received a grade of 80 or above. 4 out of 4 students have passed the qualifying exam during spring 2014. 100% of the students received a grade of 80 or above. Although this seems to be successful, the committee that makes up the qualifying exam does not consist of deans, associate deans, and department chairs. Its make-up is strictly from faculty which might include the positions listed but does not necessarily do so. This will be addressed in 2014-2015.

Related Action Plans (by Established cycle, then alpha):

Develop evaluation tool
Develop evaluation tool to facilitate data collection.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: Results of the Qualifying Procedures | Outcome/Objective: Qualifying Procedures

Projected Completion Date: 09/2014
Responsible Person/Group: Faculty

Improve Qualifying Exam Process.
Although this seems to be successful, the committee that makes up the qualifying exam does not consist of deans, associate deans, and department chairs. Its make-up is strictly from faculty which might include the positions listed but does not necessarily do so. This will be addressed in 2014-2015.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: Results of the Qualifying Procedures | Outcome/Objective: Qualifying Procedures

Implementation Description: More consistent qualifying exam process.
Responsible Person/Group: Deans and faculty from the programs participating in DENAS.

SLO 2: Ph.D. Research

Ability to apply advanced concepts, both Colleges to develop Ph.D. Research

Related Measures

M 2: General Examination
Passing General Examination

Source of Evidence: Academic direct measure of learning - other
Target:
100% of the students taking the General Examination will attain a grade of at least 95

Finding (2013-14) - Target: Partially Met
6 out of 6 students have passed the general exam during the summer and fall of 2013. 100% of the students received a grade of 95% or above. 3 out of 3 students have passed the general exam during the spring of 2014. 100% of the students received a grade of 95% or above. Although this seems successful, there is a great variety in what the general exam actually is, in the 9 programs that participate in DENAS. This will be addressed in 2014-2015.

Related Action Plans (by Established cycle, then alpha):

Develop evaluation tool
Develop evaluation tool to facilitate data collection
Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Hgh
Relationships (Measure | Outcome/Objective):
Measure: General Examination | Outcome/Objective: Ph.D. Research
Implementation Description: Faculty
Projected Completion Date: 10/2014

General Examination Process
The General Examination Process varies greatly across the 9 programs that participate in DENAS. Although some variation is necessary due to the nature of the disciplines, there must be more communality if the DENAS program is to continue and its true inter-disciplinary nature restored. The programs have gone too far in establishing individual rules.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Hgh
Relationships (Measure | Outcome/Objective):
Measure: General Examination | Outcome/Objective: Ph.D. Research
Implementation Description: Re-focus of the general examination process.
Responsible Person/Group: Deans and faculty of the programs participating in DENAS.

SLO 3: Advanced engineering and/or science research
Ability to perform advanced engineering and/or science research

Related Measures

M 3: Dissertation presentation
Presentation of the Ph.D. dissertation at an open advertised meeting
Source of Evidence: Administrative measure - other

Target:
100% of the candidates will attain Final approval of the Ph.D. Dissertation by 100% of the members of the Ph.D. Dissertation Committee

Finding (2013-14) - Target: Partially Met
10 out 10 students finished their dissertations during the summer and fall 2013. 100% of the students graduated. 1 out of 1 students finished their dissertation during the spring of 2014. 100% of the students graduated. Although it seems that this metric has been met, it is not adequate to establish a measure of overall quality of the program. This will be addressed in 2014-2015.

Related Action Plans (by Established cycle, then alpha):

A better metric for program completion
Completion of degree requirements by degree requirements, is not in itself, a measure of program quality or productivity. The inter-disciplinary nature of the program must be stressed and evaluated. The time it takes for a PhD candidate to complete a degree must be evaluated. This will be addressed in 2014-2015.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Hgh
Relationships (Measure | Outcome/Objective):
Measure: Dissertation presentation | Outcome/Objective: Advanced engineering and/or science research
Implementation Description: Implement better program completion assessment
Responsible Person/Group: Deans and faculty of the programs participating in DENAS

Develop evaluation tool
Develop evaluation tool to facilitate data collection
Established in Cycle: 2013-14
Implementation Status: Planned
Priority: Hgh
Relationships (Measure | Outcome/Objective):
Measure: Dissertation presentation | Outcome/Objective: Advanced engineering and/or science research
Projected Completion Date: 10/2014
Responsible Person/Group: Faculty

SLO 4: Publish research
Ability to publish research
Related Measures

M 4: Submission of papers for publication
Submission of technical papers for publication in high quality refereed journals
Source of Evidence: Academic indirect indicator of learning - other

Target:
100% of graduating DENAS students have prepared at least one paper that is deemed suitable for publication in refereed journals, in the opinion of the Dissertation Committee.

Finding (2013-14) - Target: Met
From the 10 students who graduated in summer and fall of 2013 there were 34 publications (100% participation of students)

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

A better metric for program completion
Completion of degree requirements by degree requirements, is not in itself, a measure of program quality or productivity. The inter-disciplinary nature of the program must be stressed and evaluated. The time it takes for a PhD candidate to complete a degree must be evaluated. This will be addressed in 2014-2015.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: Dissertation presentation | Outcome/Objective: Advanced engineering and/or science research

Implementation Description: Implement better program completion assessment
Responsible Person/Group: Deans and faculty of the programs participating in DENAS

Develop evaluation tool
Develop evaluation tool to facilitate data collection.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: Dissertation presentation | Outcome/Objective: Advanced engineering and/or science research

Projected Completion Date: 09/2014
Responsible Person/Group: Faculty

Develop evaluation tool
Develop evaluation tool to facilitate data collection.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: Dissertation presentation | Outcome/Objective: Advanced engineering and/or science research

Projected Completion Date: 10/2014
Responsible Person/Group: Faculty

Develop evaluation tool
Develop evaluation tool to facilitate data collection.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: General Examination | Outcome/Objective: Ph.D. Research

Implementation Description: Re-focus of the general examination process.
Projected Completion Date: 10/2014
Responsible Person/Group: Deans and faculty of the programs participating in DENAS.

General Examination Process
The General Examination Process varies greatly across the 9 programs that participate in DENAS. Although some variation is necessary due to the nature of the disciplines, there must be more communality if the DENAS program is to continue and its true inter-disciplinary nature restored. The programs have gone too far in establishing individual rules.

Established in Cycle: 2013-14
Implementation Status: Planned
Priority: High

Relationships (Measure | Outcome/Objective):
Measure: General Examination | Outcome/Objective: Ph.D. Research

Implementation Description: Re-focus of the general examination process.
Responsible Person/Group: Deans and faculty of the programs participating in DENAS.

Improve Qualifying Exam Process.
Although this seems to be successful, the committee that makes up the qualifying exam does not consist of deans, associate deans, and department chairs. Its make-up is strictly from faculty which might include the positions listed but does not necessarily do so. This will be addressed in 2014-2015. There will be an effort that will be completed in 2014-2015 that makes the qualification process more consistent across the programs. That was actually the goal of having deans, associated deans, and chairs involved in the exam. That approach does not now seem viable. Other
approaches will be examined and implemented in 2014-2015.

**Established in Cycle:** 2013-14  
**Implementation Status:** Planned  
**Priority:** High

**Relationships (Measure | Outcome/Objective):**
- **Measure:** Results of the Qualifying Procedures  
- **Outcome/Objective:** Qualifying Procedures

**Implementation Description:** More consistent qualifying exam process.

**Responsible Person/Group:** Deans and faculty from the programs participating in DENAS.