Electrical Engineering - Ph.D
2017 - 2018 Assessment Plan

Currently status is: Report Accepted

I. ANNUAL REPORT FOR 2016 - 2017

Mission Statement

The mission of the PhD program is to prepare students to perform advanced research in electrical engineering.

Goal 1.

To provide students with a strong foundation of electrical engineering skills in their specialty area.

Curriculum

Students entering the Ph.D. program with a B.S. degree are required to complete a minimum of 48 hours of coursework and 12 hours of dissertation preparation. At least half of all coursework must be completed at the 700 level or above. Satisfactory progress will be demonstrated by coursework completion within 3 years of enrollment, and degree work completion within 5 years of enrollment.
Students entering the Ph.D. program with an approved MS or ME degree are required to complete a minimum of 18 hours of coursework and 12 hours of dissertation preparation. At least half of all coursework must be completed at the 700 level or above. Satisfactory progress will be demonstrated by coursework completion within 1.5 years of enrollment, and degree work completion within 3 years of enrollment.
In general, graduate coursework will be chosen in conjunction with a student's dissertation advisor and will be directed toward gaining a deeper understanding of the area of electrical engineering connected to the student's research. The Program of Study (POS) must be defined in consultation with the student's faculty advisor and be approved by the graduate director within the first year of enrollment. A minimum of three courses at the 700 level or above should be selected from one of the major research areas of the Electrical Engineering Department.

Learning Outcome 1.

An understanding of fundamental concepts and an ability to solve problems in their major area of research.

Measures and Criteria

All Ph.D. students are required to demonstrate fundamental knowledge and skills in their major area of research. The outcome is tested during the Qualifying Exam.
The outcome will be considered achieved if 80% of the students passed in their major area of research in the Qualifying Exam (in their first attempt).

Methods

The knowledge of the students in their major area of research is tested during the Qualifying Exam by administering a written examination. The data on student performance is stored and managed by the Graduate Director.
The overall performance of the students will be compared against the criteria, and if a problem arises the Graduate Director will discuss it in graduate committee and general faculty meetings at the end of each Fall and Spring semester and carry out measures to address the problem.

Results

During this assessment period 7 students took the Ph.D. Qualifying Examination. Out of the 7 students, 6 took it for the first time and 1 did not pass in his/her major research area on the first attempt.

The success rate was 83% for the first attempt on questions in the major area, thus, the criteria was met.

Use of Results

The Qualifying Exam was in the second year of a new written format during this assesment cycle. During the course of the year the faculty met and decided to provide a new set of guidelines to help students focus on the most appropriate review material for this exam. We will meet again after the Fall 2017 Qualifying Exam to review the results and make further corrective action if needed. We have also been collecting admission testing data for our new students and will attempt to determine if this might be an indicator of less prepared students being admitted into the program.

Learning Outcome 2.

An ability to solve basic problems in related areas of research other than their major area.

Measures and Criteria

All graduate students are required to demonstrate a breadth of knowledge in other areas related to their major area of research. This outcome is tested during the Qualifying Exam.
The outcome will be considered met if 70% of the students pass in the minor areas of their Qualifying Exam (in their first attempt).

Methods

The knowledge of the students in areas other than their major area of research is tested during the Qualifying Exam by administering a written examination. The data on student performance is stored and managed by the Graduate Director.
The overall performance of the students will be compared against the criteria, and if a problem arises the Graduate Director will discuss it in graduate committee and general faculty meetings at the end of each Fall and Spring semester, and carry out measures to address the problem.

Results

During this assessment period 7 students took the Ph.D. Qualifying Examination. Out of the 7 students, 6 took it for the first time and 2 did not pass in areas other than his/her major area on the first attempt.

The success rate was 67% for the first attempt on questions in areas other than the student's major area, thus, the criteria was not met.

Use of Results

The Qualifying Exam was in the second year of a new written format during this assesment cycle. During the course of the year the faculty met and decided to provide a new set of guidelines to help students focus on the most appropriate review material for this exam. We will meet again after the Fall 2017 Qualifying Exam to review the results and make further corrective action if needed. We have also been collecting admission testing data for our new students and will attempt to determine if this might be an indicator of less prepared students being admitted into the program.

Learning Outcome 3.

An expertise in their specialty area that is requisite for conducting research in that area.

Measures and Criteria

Students are required to pass a Comprehensive Exam administered by their Dissertation Committee. We will consider the outcome met if 80% of the students are able to pass the comprehensive exam within 4 years if they enter the program with a BS degree, and within 3 years if they enter the program with an ME/MS degree.

Methods

The comprehensive exam for Ph.D. students is managed by their Dissertation Committee. The student is required to solve a set of complex problems in his/her research field that is representative of what is needed during the course of research. The quality of the work is evaluated by their Dissertation Committee.
The overall performance of the students will be compared against the criteria, and if a problem arises the Graduate Director will discuss it in graduate committee and general faculty meetings at the end of each Fall and Spring semester and carry out steps to address the problem.

Results

During this assessment period there were 9 students who took the PH.D. Comprehensive Examination, out of whom 6 had an MS/ME degree upon admission to the program.

Within the cohort of students without an MS/ME degree, three out of three students successfully passed the PH.D. comprehensive examinatin within a 4 year timeframe yielding 100% success.

Within the cohort of students with an MS/ME degree, four out of the six passed the PH.D. examination within a 3-year timeframe yielding 66% success. One student took an extra 2 years and the other an extra year to successfully pass the Ph.D. comprehensive examination.

Use of Results

The graduate committee will review the program of study for all students not meeting the criteria to

determine the reason for longer than average time to completion. Results of this review will be reported by the graduate committee to the faculty at the second Fall 2017 faculty meeting where recommenations will also be given based on the findings.

Goal 2.

Prepare doctoral students to conduct deep research within their specific research or professional interest area under the guidance of a faculty member.

Curriculum

All Ph.D. students are required to include a minimum of 12 hours of dissertation preparation in their Program of Study. These hours account for the time spent by the students working in close relation with their faculty supervisor. This collaboration is provided to boost the personal skills of the students in performing independent research. All Ph.D. students are required to pass a Comprehensive exam focusing on their research field and administered by their Advisory Committee within three years if they hold a Master's degree, and four years if they hold a Bachelor's degree.

Learning Outcome 1.

Doctoral students will demonstrate an understanding of the discovery and innovation process as it relates to electrical engineering.

Measures and Criteria

Ph.D. students are required to prepare and successfully defend a Dissertation Proposal. In doing so the student must be able to identify a significant problem, and how to attack that problem. The student must also be able to describe the existing state of the art as the context in which their research is conducted which requires an expansive literature search and references in the dissertation proposal. We will consider the outcome reached if at least 70% of students meet the criteria.

Methods

We will measure the percentage of Ph.D. students with prior MS/ME degrees who are able to submit and successfully defend their dissertation proposal within 3 calendar years, and those without ME/MS are able to do so within 4 calendar years.

The data will be collected and stored by the graduate director. The overall performance of the students will be compared against the criteria, and any discrepancies would be discussed in the graduate committee and general faculty meetings at the end of each Fall and Spring semester, and steps will be taken to address them.

Results

During this assessment period there were 9 students who presented a dissertation proposal, out of whom 6 had an MS/ME degree upon admission to the program.

Within the cohort of students without an MS/ME degree, three out of three students successfully presented the PH.D. Dissertation Proposal within the 4 year timeframe yielding 100% success.

Within the cohort of students with an MS/ME degree, four out of the six passed within the 3-year timeframe yielding 66% success. One student took an extra 2 years and the other an extra year to successfully present a proposal.

Use of Results

It appears that for the cohort of students holding a Master's degree there was not an overall benefit to their ability to conduct research as compared to those without. The graduate committee will review the program of study for those students and compare it to their Master's degree transcripts in order to determine if there is a difference for students with a thesis or non-thesis Master degree. Results will be reported to the faculty in the second Fall 2017 faculty meeting.

The literature review was not evaluated since a rubric for that was not put into place in time for this assesment report. A rubric will be developed in the first half of the Fall 2017 semester by the graduate committee for evaluation of the references appearing in the dissertation proposals.

Learning Outcome 2.

Doctoral students will demonstrate an ability to perform research in one of the major areas of the department.

Measures and Criteria

Ph.D. students are required to write and successfully defend their final dissertation. We will consider the outcome successfully achieved if 70% of the students are able to successfully defend their dissertation within 5 years if they enter the program with a BS degree, and within 4 years if they enter the program with an ME/MS degree.

Methods

Students are required to successfully defend their dissertations in front of their Dissertation Committee. We plan to monitor the progress of our Ph.D. students by measuring the number of students that can complete their defense within 4 years of enrollment for students who enroll with Master's degrees. Similarly we plan to monitor the progress of our Ph.D. students by measuring the number of Ph.D. students that can complete their defense within 5 years of enrollment for students who enroll with Bachelor's degrees.
The overall performance of the students will be compared against the criteria, and if a problem arises the Graduate Director will discuss it in graduate committee and general faculty meetings at the end of each Fall and Spring semester, and carry out measures to address the problem.

Results

During this assessment period within the cohort of studetns with an MS/ME degree, six out of eleven successufully defended their dissertations within the 4-year timeframe yielding 55% success. The other five students took an extra year to successfully defend. During this time period there were 2 of 2 students without a MS/ME degree that sucessfully defended their dissertations within the 5-year timeframe yielding 100% success.

Use of Results

In roughly half of the cases MS/ME degrees are not yielding a reduction in the time to completion as expected. The graduate committee will review programs of study in an attempt to detmine what factors may be involved such as MS versus ME and change of focus area for the PhD relative to the MS/ME. Results of the review will be reported to the faculty during a Fall 2017 faculty meeting.

Learning Outcome 3.

Doctoral students will demonstrate the ability to describe complex ideas to others.

Measures and Criteria

This measurement is the number of journal papers published by the Ph.D. students who graduate from our program. We will consider this outcome met if 80% of the students published or have in press one journal publication, and have in submitted status one or more journal papers.

Methods

We will collect the list of refereed journal papers published, in press, and submitted by each Ph.D. student at the time of their dissertation defense.
The overall performance of the students will be compared against the criteria, and if a problem arises the Graduate Director will discuss it in graduate committee and general faculty meetings at the end of each Fall and Spring semester, and carry out steps to address the problem.

Results

During this assessment period ten students graduated with their Ph.D. Out of these ten all had published and submitted for publication more than 2 journal papers. Thus the success rate was 100% and the criterion was exceeded.

Use of Results

The criteria was met and no action is needed.

II. FUTURE ASSESSMENT PLAN FOR 2017 - 2018

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