

Electrical Engineering - Ph.D

Group 4: Cycle 1 - Fall 2017 - Fall 2018

Currently status is: Report Accepted

ASSESSMENT REPORT FOR Group 4: Cycle 1 - Fall 2017 - Fall 2018

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 of Fall 2017 and Spring 2018 period 20 students took the PhD Qualifying Examination. Out of the 20 students, 17 took it for the first time and 3 did not pass in his/her major research area on the first attempt.

The success rate was 82% 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 its new written format during this assessment cycle. The graduate committee is continually assessing and updating the qualifying exam as well as expanding/editing the current database of exam questions.

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 of Fall 2017 and Spring 2018, 20 students took the PhD Qualifying Examination. Out of the 20 students, 17 took it for the first time and 5 did not pass in one area or more other than his/her major area on the first attempt.

The success rate was 70.5 (71)% for the first attempt on questions in areas other than the student's major area, thus the criteria was met.

Use of Results

The Qualifying Exam was in the second year of its new written format during this assessment cycle. The graduate committee is continually assessing and updating the qualifying exam as well as expanding/editing the current database of exam questions.

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 (Fall 2017, Spring 2018, Summer 2018) period there were 4 students who took the PhD Comprehensive Examination, out of whom all 4 had an MS/ME degree upon admission to the program.

Within those 4 students that came in with a MS/ME degree, 2 passed the PhD Comprehensive Examination within a 3-year period yielding 50% success. The other students passed the exam just over 3 years but under 4. All 4 students at the time of the comprehensive exam were full time students. Therefore just missing being 100% successful.

Use of Results

The Graduate Committee has established a rule that will be enforced, specifically this: students must complete their proposal defense (comprehensive exam) at least one year prior to defending their dissertation. (This should also help students to complete the goals in outcomes 1 and 2.) The committee will also continue to review the programs of study for all students not meeting the criterion, to determine if there are systematic reasons for the longer-than-average completion times.

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 (Fall 2017, Spring 2018, and Summer 2018) period there were 4 students who presented a dissertation proposal, out of whom all 4 had an MS/ME degree upon admission to the program. Also 3 of the 4 students were full time students.

Of the 3 full-time students that came in with a MS/ME degree, 1 successfully presented the PhD proposal within a 3-year period yielding 33% out of the full-time students. The other 2 students successfully presented the PhD proposal just over 3 years but under 4.

The one part-time student successfully presented the proposal in over 4 years but under 5.

Use of Results

The Graduate Committee has established a rule that will be enforced, specifically this: students must complete their proposal defense (comprehensive exam) at least one year prior to defending their dissertation. (This should also help students to complete the goals in outcomes 1 and 2.) The committee will also continue to review the programs of study for all students not meeting the criterion, to determine if there are systematic reasons for the longer-than-average completion times.

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 (Fall 2017, Spring 2018 and Summer 2018) period within the cohort of students with an MS/ME degree, there were 8 students that successfully defended their final dissertation. Within the cohort of students without an MS/ME degree, 3 successfully defended their final dissertation.

Of the 8 students with an MS/ME degree 5 were full-time and 4 were part-time students. Out of the 5 full time only 3 completed their dissertation with the 4 years; thus yielding 60% success rate. The other 2 students completed in 4+ but under 5 years.

For the 3 part-time students with ME/MS, 1 of the 3 completed within the 4 year goal. Thus 25% success rate among part-time students. For the other 2, one finished right at 6 years, the other 6+.

During this time period there were 3 of 3 students without a MS/ME degree that successfully defended their dissertations within the 5-year timeframe yielding 100% success. All 3 of these students were full-time.

Overall only 6 of 11 that successfully defended, were able to do it within the timeframe goal based on if they came in with a ME/MS or without a ME/MS degree. This yielded 55% success for all students regardless of full or part-time.

Use of Results

Faculty is currently reassessing the required duration for the current goal. The effect of the new 1-year requirement between proposal defense (comprehensive exam) and dissertation also needs to be assessed to see if this helps meet the goals.

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 (Fall 2017, Spring 2018, and Summer 2018) 10 students graduated with their PhD degree. Out of these 10 all had published and submitted at least one journal publication. Therefore we exceeded the 80% goal with 100%. In fact 80% of the graduates (8 of 10) published at least 2 or more journals.

Use of Results

The criteria was met and no action is needed.