

Electrical Engineering - ME/MS

2017 - 2018 Assessment Plan

Currently status is: Report Accepted

I. ANNUAL REPORT FOR 2016 - 2017

Mission Statement

To advance students from a basic level of knowledge and understanding of EE (as represented by a Bachelor's degree in EE or a closely related field) to a mastery-level of knowledge and understanding within some sub-discipline of EE, while also providing additional depth of knowledge in one or more other sub disciplines of EE or related fields. The MS degree is intended to prepare students to perform advanced projects in a specific area of interest within the scope of research in the electrical engineering department. The ME degree is intended to enhance professional career opportunities by building depth of knowledge within selected electrical engineering sub-specialties.

Goal 1.

Develop a deep knowledge (mastery-level) within one subdiscipline of Electrical Engineering.

Curriculum

From the 30 required enrollment hours, take at least 15 within the EE course selections, and at least 15 at the 700- or 800-level. Each ME student should take at least 2 courses in the same focus area and each MS student should take at least three courses in the same focus area at least one of which should be at the 700 level or above.

Learning Outcome 1.

Become a specialist in a subdiscipline.

Measures and Criteria

For any particular student, the number of credit hours that are identified by the student's advisor as being within the subdiscipline specialty of that student. A student will be categorized as "highly specialized" if the number of hours earned equals or exceeds 18, "specialized" if the number equals or exceeds 12, and "weakly specialized" if the number equals or exceeds 9.

Program objectives are for 100% of the students who graduate in any running two-year period (or other duration necessary to achieve statistically-significant results) to be at least weakly specialized, at least 50% of students to be "specialized", and at least 25% of students to be "highly specialized". If the program objectives are not met, a review will be conducted to determine whether students choose not to specialize, or if an insufficient number of specialty courses are offered to support higher levels of specialization.

Methods

The outcome is evaluated by the Graduate Director who collects the data from the graduate program coordinator regarding the student's coursework. The overall performance 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.

Results

This is a program goal that needs to be reassessed. Therefore, this LO was not assessed this year.

Use of Results

Learning outcome will be changed in future plan.

Goal 2.

Apply that mastery-level of knowledge to the analysis, synthesis, and evaluation of engineering science or design problems.

Curriculum

The Program of Study of every MS student must include 6 hours of thesis preparation. These hours represent the time spent by the student working closely with his/her advisor in developing a research topic. The Graduate Director supervises the preparation of the Program of Study for every ME student. During the advisement meeting the Graduate Director identifies a possible area of interest for the ME student and suggests a list of classes to focus the preparation in the selected area of application.

Learning Outcome 1.

Ability to execute research or development in a specific area of interest.

Measures and Criteria

Students enrolled in the MS program are required to demonstrate research capabilities. This learning outcome is evaluated through the results of the Thesis Defense. During the Thesis Defense, the students present in oral and written form the results of their research activity. The defense is evaluated according to the following parameters:

- 1) Quality of the written document
- 2) Quality of the oral presentation
- 3) Technical quality of the performed work.

For each of the categories, the Thesis Committee can assign the following grades: unacceptable, good, or excellent which ultimately results in passing or failure.

Students enrolled in the ME program are required to demonstrate the ability to perform an advanced project. This learning outcome is evaluated through the results of a Directed Individual Study course. The course will be evaluated on the students capability to demonstrate the synthesis and integration of mastery-level knowledge in the design or analysis of an electrical or electronic system. For each category the course instructor can assign the following grades: unacceptable, good, or excellent.

The outcome will be considered to be met if at least 50% of students receive a grade of excellent and a minimum of 80% of the students receive a grade of good or higher.

Methods

The graduate faculty member overseeing the work of a Graduate Student will report the results of the thesis defense or directed individual study to the Graduate Director. The overall performance will be compared against the criteria. Outcomes will be discussed in the graduate committee and general faculty meetings at the end of each Fall and Spring semester.

Results

For this assessment we can only report on Spring of 2017 graduates. This is due to a change in assessment criteria in mid academic year. For ME students three graduated: 2 of the 3 (67%) were rated as Good and 1 of the 3 (33%) was rated as excellent. For the Spring MS students, 6 graduated. The Thesis committee rated 4 of the 6 (67%) as Good and 2 of the 6 as Excellent.

Use of Results

The rubric used during this assessment cycle was new and needs refinement in order to better determine why assessment goals are not met. The rubric provided to the MS and ME examining committees will be expanded and improved to better aid in determining the reasons for assessment outcomes. The updated rubrics will be provided to the faculty and discussed at a faculty meeting prior to the end of the Fall 2017 semester.

Learning Outcome 2.

Ability to solve sophisticated engineering problems that require integration of knowledge and skills gained in multiple graduate courses.

Measures and Criteria

The evaluation will be based on the student's solution to problems on the comprehensive exam. The comprehensive exam requires the student demonstrate integration of knowledge acquired in two or more graduate level courses. The possible results are:

- 1) Fail, if the student is not able to provide a viable solution due to lack of math or science skills or inability to integrate knowledge gained in graduate courses in the students program of study.
- 2) Good, if the student encountered problems in solving the test but was not limited by his/her math or science skills and was able to successfully integrate some knowledge from at least two courses within the students program of study.
- 3) Excellent, if the student demonstrates the ability to apply broader knowledge in an integrative fashion.

All students who graduate must pass the comprehensive exam. The outcome will be considered to be met if at least 70% of the students score Good or Excellent on their first of two possible attempts.

Methods

Professors in charge of grading the Comprehensive Exam, which is administered once every semester, will be asked to evaluate the mathematical and scientific skills of each of the students according to the scale mentioned above. The overall performance 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.

Results

Although this report for Summer 2016, Fall 2016 and Spring 2016 we can only report results for Spring of 2017 graduates. This is where the change was implemented to rate students.

For ME students 3 took the Comprehensive Exam: 2 of the 3 (67%) were rated as Good and 1 of the 3 (33%) was be rated as excellent. Therefore for ME goal was met of more than 70% scoring Good or Excellent. This was the first attempt for all 3 yielding 100% success rate for the criterion.

For MS students 6 took the Comprehensive Exam in the Spring of 2017. Four of the 6 (67%) were rated as Good and 2 of the 6 (33%) were rated as Excellent. This was the first attempt for all 6 therefore reaching the department goal of at least 70% of students scoring Good or Excellent on their first of two possible attempts.

Use of Results

All criteria have been met and no action is required. However, the rubric is new for evaluation of the comprehensive exam and will be reviewed for potential refinements by the graduate committee during the Fall 2017 semester.

II. FUTURE ASSESSMENT PLAN FOR 2017 - 2018

Mission Statement

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Goal 1.

Develop a deep knowledge (mastery-level) within one subdiscipline of Electrical Engineering.

Curriculum

From the 30 required enrollment hours, take at least 15 within the EE course selections, and at least 15 at the 700- or 800-level. Each ME student should take at least 2 courses in the same focus area and each MS student should take at least three courses in the same focus area at least one of which should be at the 700 level or above.

Learning Outcome 1.

Become a specialist in a subdiscipline by successfully planning and executing a program of study in an area of interest.

Measures and Criteria

Seventy percent of students will successfully complete a program of study within three months of admission to the program.

Methods

Students will draft a program of study and meet with their academic advisor who will review the program of study. The final program of study is evaluated by the Graduate Director. Students will be contacted if revisions are needed to the program of study. The number of completed programs of study will be recorded by the graduate program coordinator after 3 semesters for each cohort. Data will be discussed in the graduate committee and general faculty meetings at the end of Fall and Spring Semester.

Goal 2.

Apply that mastery-level of knowledge to the analysis, synthesis, and evaluation of engineering science or design problems.

Curriculum

The Program of Study of every MS student must include 6 hours of thesis preparation. These hours represent the time spent by the student working closely with his/her advisor in developing a research topic. The Graduate Director supervises the preparation of the Program of Study for every ME student. During the advisement meeting the Graduate Director identifies a possible area of interest for the ME student and suggests a list of classes to focus the preparation in the selected area of application.

Learning Outcome 1.

Ability to execute research or development in a specific area of interest.

Measures and Criteria

Students enrolled in the MS program are required to demonstrate research capabilities. This learning outcome is evaluated through the results of the Thesis Defense. During the Thesis Defense, the students present in oral and written form the results of their research activity. The defense is evaluated according to the following parameters:

- 1) Quality of the written document
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For each of the categories, the Thesis Committee can assign the following grades: unacceptable, good, or excellent which ultimately results in passing or failure.

Students enrolled in the ME program are required to demonstrate the ability to perform an advanced project. This learning outcome is evaluated through the results of a Directed Individual Study course. The course will be evaluated on the students capability to demonstrate the synthesis and integration of mastery-level knowledge in the design or analysis of an electrical or electronic system. For each category the course instructor can assign the following grades: unacceptable, good, or excellent.

The outcome will be considered to be met if at least 50% of students receive a grade of excellent and a minimum of 80% of the students receive a grade of good or higher.

Methods

The graduate faculty member overseeing the work of a Graduate Student will report the results of the thesis defense or directed individual study to the Graduate Director. The overall performance will be compared against the criteria. Outcomes will be discussed in the graduate committee and general faculty meetings at the end of each Fall and Spring semester.

Learning Outcome 2.

Ability to solve sophisticated engineering problems that require integration of knowledge and skills gained in multiple graduate courses.

Measures and Criteria

The evaluation will be based on the student's solution to problems on the comprehensive exam. The comprehensive exam requires the student demonstrate integration of knowledge acquired in two or more graduate level courses. The possible results are:

- 1) Fail, if the student is not able to provide a viable solution due to lack of math or science skills or inability to integrate knowledge gained in graduate courses in the students program of study.
- 2) Good, if the student encountered problems in solving the test but was not limited by his/her math or science skills and was able to successfully integrate some knowledge from at least two courses within the students program of study.
- 3) Excellent, if the student demonstrates the ability to apply broader knowledge in an integrative fashion.

All students who graduate must pass the comprehensive exam. The outcome will be considered to be met if at least 70% of the students score Good or Excellent on their first of two possible attempts.

Methods

Professors in charge of grading the Comprehensive Exam, which is administered once every semester, will be asked to evaluate the mathematical and scientific skills of each of the students according to the scale mentioned above. The overall performance 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.