ELECTRICAL ENGINEERING - DOCTOR OF PHILOSOPHY

Requirements for Ph.D. Degree
The Program Educational Objectives for the Doctorate in Electrical Engineering are:

1. That graduates obtain relevant, productive employment performing research in academia, government or industry, and/or are teaching at institutions of higher education.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree.

Option 1 - Ph.D. with Completed MS Degree
1. Complete undergraduate deficiency coursework, if the student admitted has both master's and bachelor's degrees in fields other than electrical engineering. Complete graduate deficiency coursework, which consists of three graduate core courses from three different areas of emphasis, if the student has a master's degree in a field other than electrical engineering.
2. Complete a minimum of 18 credits beyond the master's of graduate course work with the following restrictions:
   a. E E courses must be numbered 500 or higher. Non-E E courses must be 450 or higher.
   b. At least half of the 18 credits must be taken in the Klipsch School (E E).
   c. At most 6 credits may be research, for example, E E 600 Doctoral Research, and E E 590 Selected Topics courses that are not listed as regular courses in the schedule.
   e. If the MS degree is not E E, exclude credits from graduate deficiency coursework.

Option 2 - Direct Ph.D. with BSEE or Equivalent, but no MS Degree
1. Complete three graduate core courses.
2. Complete a minimum of 42 credits of graduate coursework, including the three graduate core courses with the following restrictions:
   a. At least half of the 42 credits must be numbered 500 or higher.
   b. At least half of the 42 credits must be taken in the Klipsch School (E E).
   c. At most 9 credits may be research, for example, E E 600 Doctoral Research, and E E 590 Selected Topics courses that are not listed as regular courses in the schedule.
   e. Courses excluded from the MSEE are also excluded from the Ph.D. program.
   f. At least half of the credits must be taken with other than a single professor.

Common Requirements for all Ph.D. Candidates
1. Participate in one semester of research seminars (E E 501 Research Topics in Electrical and Computer Engineering, 1 credits)
2. Take and pass the Ph.D. qualifying exam.
3. Pass a comprehensive examination. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. It may cover course work, include a proposal for dissertation research, and may be preceded by a written exam.
5. Submit evidence for a minimum of two publications related to the dissertation research, one of which is submitted to an internationally-recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference. Submissions must be completed prior to the final oral exam.¹
6. Pass a final oral exam which defends the dissertation.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

Ph.D. Qualifying Exam
The Ph.D. Qualifying Exam is typically offered on the Monday just prior to the beginning of each semester. The format is one half day written exam. The examination indicates a readiness for research at the graduate level. Students answer a total of six questions with two coming from each of three areas of emphasis. Taking three graduate core courses (listed listed in the MSEE program) prepares students for the Ph.D. qualifying exam.

PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.