ECE PhD Research Qualifying Exam Rules

The purpose of the Research Qualifying Exam (RQE) is to assess whether students can define a research problem, critically review the literature related to the problem, apply appropriate research methods to study the problem, and interpret and communicate their results. The RQE requires students to complete a short research project and to document their results in a written report and an oral presentation. The RQE topic is defined by a faculty advisor in consultation with the student. A committee of three ECE faculty members (the advisor plus two additional members) evaluates the written report and the oral presentation. During the presentation the student is expected to answer questions about their project and about fundamental concepts related to the research.

Students who enter the program with an MS degree are encouraged to start working on their RQE as soon as they enter the PhD program and no later than the start of their second semester in the program regardless of their performance on the TQE. These students are required to present their paper in the RQE exam no later than the end of their third semester in the program. Students who enter the program with a BS degree are required to take the exam prior to completing 30 credits in the program regardless of their performance on the TQE.

It is advisable that students use the RQE to explore ideas that may eventually lead to their Ph.D. research. Typically, the student will be assigned a review paper or a key paper in the area of interest. The student will have to review the literature in the area of interest, identify a research problem, and demonstrate critical reading of the paper (or related literature) by challenging some assumptions or identifying the limitations of some methods. Students are expected to expand on some of the ideas in the paper(s), or implement some key ideas of the paper(s) in a computer language suitable for a given area (e.g., Matlab, VHDL, C, PSpice, etc.), or perform some preliminary experiments to investigate aspects of the research problem. Students are expected to analyze and interpret the results of these investigations. The report should be a reflection of the student's perception of the subject matter rather than a plain summary of the paper(s). The report should not exceed the length of a typical IEEE conference paper (4-6 pages, two-column format, 10 pt font). The RQE paper should be submitted to the committee at least one week prior to the RQE presentation. The presentation should not exceed 20 minutes.

Evaluation

The written research paper and the presentation will be evaluated using the following four criteria. Students must receive at least a “competent” ranking (3 on a scale of 1-5) on each of the following four evaluation criteria to pass the RQE:

1. Ability to articulate the research problem and its significance.
2. Ability to critically review the literature.
3. Understanding of research methods.
4. Ability to communicate and interpret research results.