ECE PhD Qualifying Exam (New Format QE)
Guidance for Students

The New Format qualifying exam (QE) consists of a written report and an oral presentation. Each element of the exam is assessed and scored independently. The exam should be taken by the end of the second semester of your first year at Duke. If necessary, for example due to scheduling conflicts within your committee, the exam may be taken during the summer of your first year (for the 2018-2019 academic year, any student that has not yet passed the QE may choose either this New Format QE or the Old Format QE, regardless of their time in the program). Both portions of the exam (written and oral) must be passed. No more than two attempts to pass are allowed for each portion of the exam.

The purpose of the qualifying exam is to assess your readiness for research and successful completion of the PhD.

To successfully pass the qualifying exam, you must demonstrate the following:

1. Reading and deeply understanding papers in your field of interest.
2. Analyzing the state of the field in a particular problem space of interest.
3. Understanding the strengths and shortcomings of existing work in the problem space of interest.
4. Understanding why a problem space is important/how it fits into the field more broadly.
5. Writing and presenting information supporting the points above.

The first step of the process is to create your qualifying exam committee. Your committee will assess your written report and oral presentation and will determine if you pass the exam. Your committee should be composed of three ECE faculty members who are generally in your area of research. The majority of faculty on the committee should be primary faculty members in the ECE Department. Your faculty advisor may not serve on the committee.

Your written report and oral presentation should be centered on a review of three papers in your research problem space and should address items 1-4 above. While you and your advisor will choose the papers to be analyzed, the papers must be unanimously approved by your committee. The process for paper approval is as follows:

- With the aid of your advisor, choose the papers you plan to propose to your committee.
- At least 6 weeks prior to your intended exam date, complete the Exam Details Form. For this form you will need to have prepared
  - Your committee members’ and advisor’s names and email addresses
  - Your exam date and time
  - The titles, authors, and sources of the three papers you will propose for your exam
  - PDF files of the three papers for upload
  - Advisor approval of the QE exam plan
- Once you submit the form, the ECE Graduate Office will forward the proposed papers to your committee for approval, who have one week to review and approve the papers; the Graduate
Office will inform you of the approval status within two weeks of your submission. The exam date should fall at least thirty days after this approval, so submission of the form at least six weeks in advance is important.

Note: Excessive repetition of papers in your group is not allowed and the ECE Graduate Office will maintain a database of papers used. Of the three papers submitted for approval, no more than one may have been used in a qualifying exam affiliated with that research group in the previous three years.

The written report should be constructed to clearly indicate the demonstration of points 1-4 above. The written report should be no more than ten pages in length and should be formatted and written in a style consistent with engineering and/or scientific literature or practice in your field of interest. While it is expected that a summary of the key points of the papers used as the basis for the exam will be a part of the written report, the summary should be minimal. Most of the written report should center on demonstrating points 1-4 above. In addition, you should ensure that you have a clear understanding of plagiarism (see: https://plagiarism.duke.edu/). Students found guilty of plagiarism will fail the exam at minimum; further punitive action may be taken at the discretion of the DGS and/or the ECE Department Chair.

The written report must be provided to your committee two weeks prior to the oral presentation date, during which time they will score/evaluate the report. At the oral exam, you will give an ~30 minute presentation (30 slides maximum) about the material in your report, followed by an ~30 minute Q & A.

Each portion (written and oral) of the exam is scored as +1 satisfactory, 0 marginal, or -1 unsatisfactory by each committee member. The sum of committee members’ scores must be positive (i.e., > 0) in order for you to pass the exam. Each portion (written and oral) is scored, summed, and passed or failed independently. The basis for the scores is given below.

<table>
<thead>
<tr>
<th>Score</th>
<th>Implies:</th>
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<tbody>
<tr>
<td>1</td>
<td>You have successfully shown readiness for the PhD by demonstrating all elements of the qualifying exam assessment criteria.</td>
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<tr>
<td>0</td>
<td>You have met some of the criteria for success but require improvement in some areas.</td>
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<tr>
<td>-1</td>
<td>You have not met the requirements indicating readiness for the PhD.</td>
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Rules for help during preparation of your written report and before your oral presentation:

- You may send any questions about the QE to your committee.
- You may seek help on the organization/outline of your written report from your advisor. You may also seek help from the Writing Center on editing/organization/outline. Otherwise, your writing must be your own.
- After the written document is submitted, you may give practice talks to anyone you want. You may receive useful feedback from people on these talks (including your advisor) but you must incorporate it on your own (e.g., people can suggest changes to your slides, etc. but you must execute these changes yourself.