Guidelines for Qualifying Review for Power Electronics and Power Systems Group

The qualifying review will adhere to the guidelines given in the ECE graduate handbook: http://www.ece.ncsu.edu/academics/grad/handbook.pdf. This document outlines the process for administering the exam in PES group. The spirit of the review is to assess the student's potential to succeed in the Ph.D. program. The key factors that will be considered include:

- academic performance while enrolled in Ph.D. program,
- the student’s in-depth knowledge on this specialty area,
- potential to perform at a high academic level throughout the remainder of his/her study,
- potential to conduct high-quality research, and
- the student's ability to communicate both verbally and in writing.

This process will also serve as an opportunity for improving writing skills for documents that the student will face as he/she completes the Ph.D. program and enters into a successful engineering career.

1. Exam administration. Students will be given two chances for taking this exam.
   i.) Students with master’s degree may take this exam in the second term but no later than the third term.
   ii.) Students entering with a bachelor’s degree should take this exam in either the third or the fourth term.
   iii.) Students must register for ECE 834 during this exam (3-6 credits).

2. The oral and written portion of the qualifying review will be conducted by a committee consisting of 3-5 members of the PES faculty. PES faculty will form one committee to administer the exam for all the students taking it at a given semester; so the student does not need to form a committee for the exam. The student, however, has to notify the committee chair within the first week of the semester in which he/she plans to take the exam.

3. The written review will involve conducting an investigation on a problem/topic which will be given to the student during the second week of the semester. The written review will focus on analytical assessment of existing approaches to the given problem. For this, the student will select (with the supervision of his/her advisor) a set of publications (typically 1-3) to review. The quantitative assessment should involve analysis of the problem, an in-depth investigation of the proposed approach(es) to address the problem, and the assessment of the proposed approach. The academic advisor will supervise the student on his/her progress and may give initial direction in the choice of approach but should remove him/herself from the process of analysis/assessment. The final report (maximum 10 pages) should be in a conference paper format and must be submitted two weeks before the oral review.
4. The oral review will take place in the tenth week of the semester for all candidates. The review will consist of two parts, a defense of the written review and the oral exam of analytical skills. A time limit of one hour will be allowed for the entire oral exam. Both sections of this exam must be passed to the satisfaction of the committee before the student is considered to be fully in the Ph. D. program.

Defense of written review: The candidate should make a short (~20 minute) presentation based on the written document. Any questions regarding the validity of the assessment will be addressed at this time. The entire defense and proposal should not exceed 40 minutes.

Oral exam of analytical skills: The knowledge of the candidate about the core concepts of PES will be examined in the last 20 minute of the exam. Two questions will be asked to the student about the topics covered in two of the core courses the student will select from the list given below. Syllabus will be made available to the candidate upon request.

- ECE 534: Pwr Electronics
- ECE 550: Pwr Sysms
- ECE 553: Pwr Sem Dev
- ECE 592: Motor Drives
- ECE 511: Analog Elect
**Qualifying Review – Graduate Handbook**

PhD students must request a Qualifying Review by his/her ECE Graduate Advisory Committee Members no later than their third semester of enrollment. The student should be enrolled in the qualifying review course (ECE834) during the semester in which the qualifying review takes place. The ECE Committee Members will meet and review the student's potential to succeed in the Ph.D. program. Key factors considered include: the student's academic performance while enrolled in the Ph.D. program, potential to perform at a high academic level throughout the remainder of his/her study, potential to conduct high-quality research, and the student's ability to communicate both verbally and in writing. The student’s Graduate Advisory Committee will decide the exact nature of the Qualifying Review, which serves the purpose of the qualifying exam given in many universities. Such exams usually test the student’s general background in ECE and in-depth knowledge in his/her chosen specialty. In the ECE department at NCSU, we have determined to measure the student’s breadth of knowledge by his/her performance in at least three graduate level courses that are outside the student’s specialty. This is reflected in the course requirements for the degree. The qualifying review is used to determine the in-depth knowledge.

The Qualifying Review may take many forms, including a formal written exam. However, it must have both oral and written components. At the conclusion of this review, the committee will recommend, by majority vote, for or against allowing the student to continue in the Ph.D. program. The written component should be submitted to the Graduate Office to be entered into the student’s file. Students failing to obtain a majority recommendation to continue will be asked to withdraw from the program after the third semester. No student will be allowed to enroll for a fourth semester without a favorable Qualifying Review. Failure to withdraw will result in termination of admission to the program. Students in good standing who entered the Ph.D. program without having completed a master's degree may elect to transfer to the M.S. program for a terminal M.S. degree if they have completed less than six semesters at NCSU.