

## Department of Electrical Engineering Qualifying Exam Policy

September 16, 2013

Doctoral students must take a qualifying exam during the first year of their graduate study, and may not defend a Dissertation Prospectus until they receive a rating of Qualified as described in this document. The qualifying exam is offered during the Spring Semester of each year and is based on core material included in every ABET accredited undergraduate electrical engineering curriculum. If there is sufficient demand, the qualifying exam may also be offered during the Fall Semester.

The qualifying exam is a written exam and is administered over a two-day period. Exam questions come from the six areas identified with corresponding University of Mississippi undergraduate courses in the description shown below.

**Area I Mathematics:** (a) Differential Equations MATH 353 (b) Complex Variables and Matrices (either ENGR 410 or MATH 459 and ENGR 310) **or** Discrete Math MATH 301

**Area II Systems Theory:** (a) Linear Systems EL E 331 (b) Control Systems Theory EL E 431

**Area III Electrical, Electronic Devices and Circuits:** (a) Electric Circuits ENGR 360 (b) Electronics EL E 351

**Area IV Digital Systems:** (a) Principles EL E 235 (b) Advanced Digital Systems EL E 385 **or** Microprocessor Systems EL E 485

**Area V Communications/Networks:** (a) Probability and Random Processes EL E 391 (b) Communications Theory EL E 447 **or** Computer Networks (either EL E 425 or Csci 561)

**Area VI EM Theory:** EM Theory: Static and Propagation EL E 341 and EL E 441

All Ph.D. students will take exams in four areas, with the areas for a particular student chosen in consultation with and approval of that student's advisor.

Students are advised to consult the University of Mississippi website to find the current syllabus and textbook for the UM Courses listed above. Exam questions will cover the central ideas and concepts and the most important problem solution techniques covered in the listed courses and will resemble the type of problems and questions that would appear on a comprehensive final examination for an undergraduate course. The qualifying exam for a student will consist of four chosen subject areas, each consisting of three questions. The exam will be administered over two separate days, with two of the subject area exams being given on the first day and two of the subject area exams being given on the second day. Students will have three hours total for the two subject areas given on the first day and three hours total for the two subject areas given on the second day. At the

end of each exam period students are expected to turn in solutions for all problems on all subject areas given during the exam period. Students failing to turn in a solution for a problem will receive zero points for that problem. Each problem will be graded on a 100-point basis (i.e. 100 for 100% correct, 90 for 90% correct and so forth). In general, students will pass a subject area if their average score for the three problems in the subject area is greater than 70. The faculty may lower the passing average for an area if this is deemed necessary to compensate for unforeseen problem complexity.

Based on the number of subject areas they pass, students will receive one of the following ratings: Qualified, Qualified with Conditions, or Probationary Status.

Students who pass all four areas will receive a rating of Qualified. A student who receives the rating of Qualified and has satisfied all other necessary conditions may prepare and defend a Dissertation Prospectus.

Students who pass three areas will receive a rating of Qualified with Conditions and will be required to retake the sections of the qualifying exam that they did not pass the next time the qualifying exam is offered. When retaking the qualifying exam, students rated as Qualified with Conditions will have one and one-half hours for the section they must attempt. Students must pass the retaken area to move to a rating of Qualified. Students who fail to pass an area will continue to be rated Qualified with Conditions and must repeat the section of the qualifying exam that they did not pass. At the discretion of the faculty, other conditions may be applied in lieu of retaking the section.

Students who pass less than three areas will receive a rating of Probationary Status and will be required to repeat all areas of the qualifying exam the next time the qualifying exam is offered. After retaking the qualifying exam, students with a Probationary Status rating will either retain that rating or move to a Qualified or Qualified with Conditions rating based on the number of areas they pass.