A. JAMES CLARK
SCHOOL OF ENGINEERING

Department of Mechanical Engineering

Graduate Handbook

2019-2020

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DEGREE REQUIREMENTS

PhD Program in Reliability Engineering

Qualifying Exam

All students entering the doctoral program are required to take the qualifying exam. The objectives of the exam are the following: (1) to determine the student's aptitude and ability to do original and independent research at the doctoral level; and (2) to assess the student's mastery of fundamental knowledge in his or her technical area and identify deficiencies. **This exam is administered in an oral format.**

Reliability Engineering doctoral students are eligible to take the qualifying exam after the completion of the equivalent of **24 credits of graduate coursework** including the completion of the reliability core course requirement with a GPA of 3.5 or better. The following core courses must be completed within a doctoral student's first four semesters:

1. ENRE 600 Fundamentals of Failure Mechanisms
2. ENRE 602 Reliability Analysis

Reliability Engineering students who do not pass the qualifying examination during their first attempt may repeat the examination during the following semester. Under no circumstances will a student be permitted to repeat the qualifying examination more than once. Students who have exhausted their opportunities to pass the doctoral qualifying examination will not be allowed to continue in the doctoral program. Such students will be permitted to remain in the program for one additional semester, after which their graduate admission will be terminated. Under no circumstances will such students be considered for readmission into the doctoral program.

Reliability Engineering graduate students will have an examining committee formed by three faculty members**, two of whom must be from the Reliability Engineering program**. All committees will be comprised of: the student's advisor, a chair, and a third member. The chair of this committee will be selected by the Co-Director of Graduate Studies for Reliability and the Chair of the Department and must be a full-time, regular faculty member. The third member will be chosen by the Technical Division Leader in consultation with the Co-Director of Graduate Studies. One Professional Track Faculty (PTK) member may serve on student's committee, but cannot be the chair, cannot serve on a committee with their supervisor, and must be a member of graduate faculty. The names of the members of the examining committees will be sent by email to the student. For the second exam given to students who fail on their first attempt, an entirely new committee of three faculty members will be selected. Each student must contact their examining committee as soon as possible to schedule the exam during the department's approved dates.

The format for the Reliability Engineering qualifying examination is as follows:

1. **The purpose of the test** is to evaluate the student's ability to conduct independent research. The student will be given a topic not necessarily familiar to them, but in the general field of reliability engineering.
   Performance in the exam will be evaluated based on the following criteria
   a. Familiarity and depth of understanding of the relevant literature
   b. Originality of the ideas addressing the research issue
   c. Clarity and quality of communicating ideas to the committee

2. Contact the Chair of your PhD qualifying exam committee ten (10) days prior to the date of your exam to obtain the question

3. Make sure that you fully understand the research question(s) being asked. It is recommended that you discuss any clarification questions you might have about the topic with your committee chair.

4. You are expected to spend ten (10) days performing this research and to prepare for presenting your approach to the committee.

5. The examination is approximately 1 hour in length.

6. Prepare a 30 minute presentation. That means a maximum of 20 slides in electronic form. A computer will be available for your use.

7. Prepare a one page written summary report. The student should study the assigned and other pertinent literature on the selected topic in order to be able to formulate research questions within the topic, suitable for doctoral-level investigation and to outline their approach for carrying out such investigation. The results of this study are to be summarized on one page, formatted as follows: single-spaced, 12-point type, and one-inch margins all around. The summery must consist of the following three paragraphs: (i) a paragraph reviewing the pertinent literature on the assigned topic, (ii) a paragraph identifying a research issue related to the topic that the student feels worthy of doctoral-level research, and (iii) a paragraph describing a suitable research approach (experimental, numerical, and/or analytical) to address the research issues proposed by the student. The summery is to be submitted to each member of the committee by noon three days prior to the scheduled exam.

8. Your presentation will be followed by questions by the committee. The committee may also ask questions during your presentation.

9. Do not request review of your presentation by the committee members prior to the examination

Exam Outcome: The examining committee will confer immediately after the exam, carry out deliberations about the exam outcome, reach a decision, and convey this decision through the Examination Committee Chair to the Graduate Office. **The student will be notified of the outcome of the exam in writing, by the ME Graduate Office (no exceptions).** This notification may include conditions that a student would need to fulfill before attaining candidacy. Examples of these conditions include courses to be taken in a certain area. The committee may also provide other constructive feedback to the student on areas or skills that need to be strengthened. This is a possible outcome for students who are found to be qualified to conduct doctoral-level research but who do not fare well on some aspect(s) of the exam, for reasons that can be remedied.