



A. JAMES CLARK
SCHOOL OF ENGINEERING

Department of Mechanical Engineering

Graduate Handbook

2020-2021

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Research Topic: Ten (10) calendar days before the date that the qualifying examination is to be held, each student will be assigned a research topic and one to two references related to some aspect of one or more of the subject areas selected by the student. The topic will be selected by the chair of the examination committee in consultation with both the student's advisor and the third committee member. This topic cannot be from the student's M.S. research area, but it can be from an area that the student might address later during their doctoral dissertation research. A different exam topic must be selected for each student.

Written Summary Report: The student should study the assigned and other pertinent literature on the assigned topic in order to be able to formulate research questions within the topic, suitable for doctoral-level investigation. The student should be able to outline their approach for carrying out such an 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 summary 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 assigned topic area, that the student feels is worthy of doctoral-level research, and (iii) a paragraph describing a suitable research approach (experimental, numerical, and/or analytical) to address the research issue proposed by the student. The summary is to be submitted to each member of the examining committee by noon, three days prior to the scheduled examination.

Oral Exam: The student will prepare a brief presentation (using appropriate media) describing their literature review, statement of appropriate research problem and proposed approach for addressing the stated research problem. The exam will begin with a 15 to 20 minute presentation by the student, and this will be the starting point for the oral exam discussion. The presentation may lead to questions (based on the student's chosen exam subject areas and potentially broader than the assigned exam topic) related to the goals of the exam. In general, the exam should take approximately one hour.

5. 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 Studies Office. 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.

The student taking the exam is considered to have passed the exam only if the committee decides unanimously in favor of the student.

Reliability Engineering Qualification Examination

Reliability Engineering Doctoral students are eligible to take the qualifying exam after the completion of the equivalent of 24 credits of graduate course work 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 for Reliability. One professional track faculty 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 Ph.D. Qualifying 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 summary 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 summary 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

The examining committee will confer immediately after the exam, carry out deliberations about the exam, reach a decision, and convey this decision through the Examination Committee Chair to the ME Graduate Studies Office. The student will be notified of the outcome of the exam by the Graduate Office, in writing.

The student taking the exam is considered to have passed the exam only if the committee decides unanimously in favor of the student.

Coursework Requirements

The Ph.D. Plan of Study sets forth the entire program of study that will be undertaken to satisfy the course requirements for the doctoral degree. The Plan of Study must be compiled in consultation with the student's advisor, who must approve the coursework plan. The plan should then be submitted to the