Qualifying Procedures

QE Phase of the PhD requirements

Description of QE Phase:
Specific Goals:
• Ensures all doctoral students acquire capabilities to conduct cutting-edge engineering research, practice analytical and critical thinking skills, integrate concepts, and communicate effectively
• Ensure that students select an advisor and research project within the first year of study
• Students obtain a solid foundation for their engineering research to build upon

Description of process: A number of factors are considered to assess the student’s ability to conduct cutting-edge materials science and engineering research, practice analytical and critical thinking skills, integrate concepts, and communicate effectively. The QE is used as the assessment tool and is evaluated by the QE committee with the assistance of the research advisor, reviewers with knowledge in the RR subject area, and an external technical writing evaluator. The QE has 2 parts: General Knowledge and Research Readiness.

Part One of the QE Process: General Knowledge of Introductory Materials Science Concepts
• Based on the introductory materials science concepts.
• All new graduate students receive a comprehensive list of questions for an oral exam: the list is distributed in August and available for download via google drive.
• Students with no MSE background enroll in MSE 500 for credit (other students can also request access to moodle to view lectures and class materials to aid them in the study process).
• First attempt: the week before classes start for the spring semester (roughly Jan 5).
• If not successful a student gets a second attempt.
• Second attempt after spring semester finals (roughly May 15).
• Format is the same as before: 30 min oral exam, 3 faculty examine each student, pass/fail based on average score (0 to 4 scale, each faculty grades independently).
• If a student does not pass on a second try he/she is moved to the masters program.
• When a student passes the general knowledge part of the QE process he/she moves to the research portion.

Part Two of the QE Process: Research Readiness
• The students submit a critical analysis of current literature research review (RR) written in the format of a journal review on a topic of their own selection (preferably related to their intended Ph.D. research).
• Student can start working on this after passing the general knowledge part.
• Student needs to write an in-depth research review (RR) paper on their chosen research area.
• Student oks the topic, title, outline with their advisor.
• Detailed instructions for the review paper provided in a separate document.
• Review papers will be submitted via moodle and screened for plagiarism. Plagiarism results in fail.
• Student needs to turn in a review paper by Aug 15 via moodle.
• The RR will be screened for plagiarism using moodle. Plagiarism will result in fail and will require that a student completely re-writes the document.
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- Student needs to get an ok from the 2 other faculty members that they will participate as reviewers for their RR over the summer: this is an opportunity to start assembling a thesis committee. Names must be submitted to the graduate services coordinator by July 30.
- The chosen 2 other faculty members should be working in the general area of the review topic.
- The graduate committee will distribute the papers for review to the advisor, 2 other faculty members and a technical writer.
- After evaluation of the RR a student will receive one of four possible outcomes by September 15: i) pass with no changes required (expected to rarely happen); ii) fail – the paper is not of acceptable quality and depth, and needs to be completely re-written; ii) minor changes are required: student needs to spend approximately 2-3 weeks to include additional information or address specific concerns identified during the presentation; iii) student needs to make major revisions that require 2-3 months in order to include substantial revisions/additions identified during the evaluation.
- All students will need to complete revisions by Dec 1 and submit them via moodle.
- The faculty advisor, technical writer and 2 other faculty members review the revision, and report to the DGP if a student has successfully completed the research portion and should remain in the program. All recommendations should be received by Dec 15. Based on the recommendations the DGP determines if the student can continue in the program.

Procedures associated with the RR portion:

The RR will be written by the student in the format of a journal review article and contains solely their original analysis of the literature. The RR must conclude with a clearly defined hypothesis or experimental question that will address significant issues related to materials science and engineering that have not been presented previously in literature or at conferences.

- 25 page limit
- Double spaced
- 12 pt font
- 1” margins
- Include page numbers
- Written by the student in the format of a journal review article on a topic of their own selection
  - related to intended Ph.D. research
  - contains solely student’s original analysis of the literature
  - The RR should be a complete and extensive literature review,
  - The RR will present a logical and sound analysis of that literature,
  - The RR must conclude with an engineering problem specification or hypothesis, and
  - The RR should be presented in an organized manner demonstrating good written communication skills

The submitted RR document is written, organized, and prepared in its entirety by the student; the RR is part of the Ph.D. qualifying process. Aside from the selection of the topic, the research advisor (major professor) plays a minimal role in this process. The advisor may address general questions from the student concerning the scope and content of the document and encourage the student to avoid certain topics or aspects. The advisor should not help organize the content of the document or help construct the concluding engineering problem specification or hypothesis formulation. However, the advisor may provide examples from literature or refer the student to existing examples of reviews from current or former graduate students.
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Evaluation of the RR:

All reviewers will provide feedback to QE committee by September 10. All reviewers will use the criteria outlined in the evaluation form (see separate document). The QE committee will meet to review all evaluations and notify students of the RR outcome as described above by September 15.

Revision Process of the RR:

After receiving the RR reviews a student should:

• Carefully read all reviews
• Schedule an appointment with PhD advisor and discuss the reviews
• Design a plan of how to address all reviewer comments
• Revise the document and prepare a cover letter
• Submit a revision

Every revision should be accompanied with a cover letter and a revised document to be submitted via moodle.

Cover letter format:

Dear Members of the QE Committee:
I have carefully considered the reviews of my RR and have made the following revisions.
I. Revisions identified by multiple reviewers:
   1. “Rewrite and reorganize content, incorporating improvements in grammar and written communication”
   Based on this comment I have re-organized the document in the following fashion:
      a)
      b)
      c)
   2.
   3.
II. Revisions identified by specific reviewers:
   1. Reviewer 1:
      “The concluding engineering problem was not clearly stated and needs to be expanded”
      Based on this reviewer’s comment I have re-stated the concluding engineering problem and have made the following additions in order to provide a more elaborate description:
      a)
      b)
      c)
   2. Reviewer 2:
   3. Reviewer 3:
   4. Additional revisions incorporated in the document:
During my revision process I have also made the following changes for the following reasons:
      a)
      b)
      c)