

MSE Ph.D. Qualifying Exam (QE)

Purpose: The QE is used as an assessment tool to determine students' ability to conduct cutting edge materials science and engineering research. It assesses their mastery and ability to understand various concepts in materials science, their ability to develop critical thinking based on understanding, analysis and synthesis, and their ability to communicate clearly and effectively.

Format: The QE has 2 parts: General Knowledge (GK) and Research Proposal (RP). It is evaluated by the QE committee in the beginning of the semester.

Part One: General Knowledge (GK) Exam of Materials Science and Engineering

- GK is an oral, general knowledge exam tests *breadth* of knowledge of introductory materials science.
- Students with no MSE background are encouraged to enroll in MSE 500 prior to taking the exam.
- All students receive a comprehensive list of questions after registering for the exam. In addition to answering these questions, students are expected to understand the science behind them and answer follow-up questions.
- The GK exam takes 30 min.
- Pass/fail is based on the average score of all three examiners and all questions asked.

Part Two: Research Proposal Exam (RP)

- The RP exam has a written and an oral component. It tests the *depth* of knowledge of the candidate.
- For the written portion, students write a research proposal (8 pages and single spaced with NSF PPPG formatting; page length does not include references). The topic can be related to their intended dissertation research. The proposal should be completed independently by the student. A research advisor can only be consulted on selection of the topic. A suggested format for the written proposal, including required sections, will be provided. The proposed work should have an underlying hypothesis motivating the work.
- The proposal should not be based on a previous master's thesis or research of the student. Submitting previously published work by the candidate would be grounds for failing the exam.
- For the oral portion, students should prepare a ten-minute power point presentation on their review topic and present it after completion of the GK portion of the exam.
- The presentation will be uninterrupted and will be followed by 20 minutes of technical questions.

Exam details

- The exam will be evaluated by three (3) independent MSE faculty. The research advisor will not serve on their own (or closely related) student's qualifier committee. A technical writing specialist will assess quality of writing of the proposal. No written feedback on the RP will be provided ahead of the oral exam but a technically insufficient, improperly formatted, or plagiarized written proposal would be grounds for failure of the exam.
- Assignment of the committees will be made by the QE committee chair and approved by the DGP.
- To register for the exam, the student must have previously completed the asynchronous course on Research Skills ([LINK](#)). To indicate completion, the student will submit their certificate of completion.
- To pass the QE, students must pass both the GK and RP. Failure of one part is considered failure of the exam. The student would then be required to take the full exam at the next available date.
- Each student gets two (2) attempts. If unsuccessful after these attempts, the student will not be able to proceed in the Ph.D. candidacy but may transfer into the master's program.
- Timing: The QE exam must be passed by the end of the 5th semester of the Ph.D. program; The exam will be given at the beginning of each academic semester:
 - August/September (Fall)
 - January/February (Spring)
- The natural time to take the exam would be in the fourth and fifth semester of enrollment in the program
- The GSC will inform the student and advisor of the exam results