■ Quick Guide for Students

This guide summarizes the requirements for each student seeking a Ph.D. degree from the program. For further details about these requirements, please see the subsequent sections. The expected times of completion of requirements in this guide are presented with full-time students in mind. The expected times of completion by part-time students are determined based on a customized program of study developed in consultation with the ISE DGS.

Courses: Each student is required to complete the **three** Ph.D.-level core courses listed in the table below.

Course Number	Course Name (# of Credits)
ISE 403	Research Methods (3)
ISE 406	Fundamentals of Optimization (3)
ISE 429	Probability and Stochastic Processes (3)

Each student is required to complete at least **six** other Ph.D.-level courses, at least **five** of which must be taken within ISE. The table below lists ISE non-core Ph.D.-level courses that are offered typically every year. Other ISE non-core Ph.D.-level courses also count toward this requirement, but are typically offered on a less regular basis.[1]

Course Number	Course Name (# of Credits)
ISE 402	Operations Research Models and Applications (3)
ISE 407	Numerical Methods and Scientific Computing (3)
ISE 415	Optimization Under Uncertainty (3)
ISE 417	Continuous Optimization (3)
ISE 418	Discrete Optimization (3)
ISE 444	Optimization Methods for Machine Learning (3)
ISE 456	Conic Optimization (3)

Qualifying Examination: Each student must pass a Qualifying Examination that is conducted by a committee of **three** program faculty members. This exam is expected to be attempted for the first time after the student's first spring semester in the program. Two failures of the exam will lead to dismissal from the program.

Performance Review: Each student must pass a Performance Review that assesses the student's performance in coursework, performance on the Qualifying Examination, and progress in developing a research agenda. The first review is conducted typically in the student's third semester in the program. The result of the review is either pass, incomplete, or fail. Failure leads to dismissal from the program.

Program Review: Each student must pass a Program Review that assesses whether all program requirements that are distinct from those overseen by the student's doctoral committee have been completed.

Dissertation Proposal Defense: Each student must pass a Dissertation Proposal Defense that is conducted by the student's doctoral committee, which is formed in consultation with the student's doctoral research advisor. The defense consists of the student submitting a written proposal document and being examined by oral presentation on the contents of the written proposal. It is completed typically in the student's second or third year in the program. After passing the Dissertation Proposal Defense, a student must apply for **Admission to Candidacy for the Doctorate** from the RCEAS and submit confirmation that the student has passed the **General Examination**, both of which are required to acquire a Ph.D. degree from Lehigh University.

Credits: Each student entering the program with a master's degree requires a minimum of 48 credits. Each student entering the program without a master's degree requires a minimum of 72 credits. In each semester, each full-time student must register for a number of credits to maintain full-time status. Prior to Admission to Candidacy, all credits not obtained through courses are obtained by registering for ISE 499 (Dissertation) credits.

Dissertation Defense: Each student must pass a Dissertation Defense that is conducted by the student's doctoral committee, which is chaired typically by the student's advisor. The defense consists of the student submitting a completed dissertation and being examined by oral presentation on the contents of the dissertation by the committee. It is completed typically in the student's fourth or fifth year in the program.

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[1]See Appendix of Ph.D. Program Rules and Procedures.