Aim of the exam

• Verify that the student is prepared to perform research at the doctoral level and complete a dissertation.

Specific aspects of the preparation to be checked

• Ability to formulate and motivate a scientific or engineering problem.
• Demonstration of mastery of the fundamentals of the supporting areas of science and engineering.

Composition of the committee

• Four members, chaired by the Dean's nominee (not the advisor).

Format of the exam

• The student gives a presentation (rehearsed length maximum 40 minutes, 25 slides) of the proposed thesis topic, the scientific background, the experimental/theoretical state of the art, and a research plan toward answering the thesis question.
• The student should demonstrate familiarity with the experimental or computational aspects of the work, but no specific results are required.
• The committee asks questions of clarification and elaboration throughout the presentation.
• The committee then probes the student's knowledge of the supporting fundamentals.
• The advisor's participation should be limited to questions and, only if needed to let the exam proceed, small clarifications.
• The exam should not take more than two hours.

Possible outcomes and recommendations

• The student passes, with possible suggestions for sharpening the topic and the plan, for improving his or her presentation technique, and/or for firming up his or her knowledge in certain areas.
• The student passes, subject to the student satisfying specific conditions set by the committee, e.g., by taking a certain course, or improving part of the presentation and re-presenting it at a later date, etc.
• The exam is inconclusive. In a second exam, the student may need to present a new or sharper research topic and plan, or need to demonstrate firmer knowledge of the supporting fundamentals. More course work may also be required.
• The student may receive some suggestions for improving his or her presentation technique.
• The committee decides that the student has not demonstrated ability to complete the Ph.D. program successfully and will be required to withdraw.

Note: the general requirements of timing, possible outcomes, etc. provided by the CHD are not repeated here. They are available in the Policies of the CHD document on the SEAS website.