

# Principles of Programming and Verification Group

## Doctoral Program Breadth and Depth Guidelines

This document supplements the Computer Science Doctoral Program Milestones Document (<https://www.bu.edu/cs/phd-program/phd-program-milestones/>) with respect to students following the Principles of Programming and Verification (POPV) Group track. After satisfying the Breadth and Depth Requirements, a student advances to candidacy, beginning the Dissertation Stage of their studies.

### Breadth Requirement

The breadth requirement is the same for all students in the department, as specified at <https://www.bu.edu/cs/phd-program/phd-program-milestones/phd-program-breadth/>. There are no additional requirements specific to POPV. Students should normally satisfy the breadth requirements by the end of their second year.

### Depth Requirements

In order to meet the requirements of the Qualifying Depth and Qualifying Oral Exams a student must form a Qualifying Depth/Oral Committee of at least three faculty members, at least two of whom must be members of the POPV group. This committee may form the basis for the student's Dissertation Committee.

The POPV depth requirements are somewhat different from what is specified in the above milestones document, but they still have two phases with similar purposes. Students should normally satisfy the depth requirements by the end of their third year.

### Depth Study

A student and their committee will agree on a Depth Study Project, which should be in the general area that the student plans to focus on in their dissertation research. The topic of this study project must be related to one or more POPV courses, and may possibly be related to additional courses in other areas of POPV applications (e.g., in systems, or security, or privacy, or machine learning, etc.), but should be more focused and advanced than the contents of such courses, all at the 500-level or above. The result of the study should be written up as a scholarly paper, complete with literature survey and bibliographic citations. Once the paper is approved by the committee, a student will progress to the Depth Oral Examination.

### Depth Oral Examination

The Depth Oral Exam will be a public presentation of the results of a student's Depth Study. In the exam, the student must demonstrate their command of the material presented in their Depth Study paper, and must demonstrate their ability to respond in real time to questions from the committee and audience.

The presentation itself should last 45-60 minutes including questions from the audience, with roughly 30 additional minutes remaining for questions from the committee about the presentation, details of the results, and related work. Students are encouraged to work with their Major Advisor as they prepare and polish their talk.

The committee will then meet to discuss the outcome of the exam. Potential outcomes are:

- The student passes the exam.
- The student conditionally passes the exam, but must prepare a short written or oral summary of a specific aspect of the presentation to the committee's satisfaction.
- The student is given an opportunity to retake the exam the following semester.
- The student fails the exam. In this case, the student will leave the doctoral program with a Master's Degree (assuming they have satisfied the requirements).

## Dissertation Stage

In the dissertation stage, a student forms their Dissertation Committee, consisting of at least three Readers, the first of whom must be their Major Advisor. They then write and defend, in a public presentation before their committee, their Dissertation Prospectus. Finally, they write and submit their Dissertation, and defend it in a public Dissertation Defense.

[Document last updated 3/20/23.]