

Addendum: Graduate Research in Computer Science

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The CPS faculty emphasizes the primacy of high-quality research in the graduate program. This addendum to the *Graduate Degree Requirements* document defines standards and mechanisms to promote and monitor the research progress of graduate students. These policies are intended to engage students in research as early as possible, encourage steady research progress with clear milestones, and define responsibilities of students and faculty in completing these milestones and monitoring progress. A primary objective in developing and applying these policies is to avoid any undue interference with the freedom of students and faculty to pursue their research goals.

Annual Progress Review

The faculty conducts an annual *progress review* of graduate students. The purpose of the review is to recognize and reward achievement, deliver constructive guidance to students, and assess the effectiveness of the graduate program. The DGS office gathers information from students and faculty and maintains records for each student as well as progress measures for the graduate program as a whole. The DGS prepares this material for discussion during an annual progress review meeting of the faculty.

Student reporting responsibilities. The faculty requests students to submit material as input to the annual review. These materials include an updated *Curriculum Vitae*, a brief (1-2 page) *research summary* with a bibliography of the student's publications and works-in-progress, and a short (1 page) *progress statement* including a self-assessment of progress for the previous year, a statement of goals for the following year, and an updated schedule of planned milestone completions. This process of planning and documenting progress and accomplishments will be valuable for students, and it will facilitate more detailed feedback from the faculty through the annual review process.

The graduate program office publishes guidelines for submitting these materials as raw text or PDF format. Bibliography entries are submitted in bibtex format and include a URL for the paper in PDF format; all co-authors of each paper should use the same bibtex entry, bibtex tag, and URL. Students are also encouraged to update their Web pages and document their research activities for publication as technical reports and/or posters, as deemed appropriate in consultation with faculty advisors.

Faculty reporting responsibilities. Faculty members report regularly on student progress to the DGS. At minimum, faculty advisors and supervisory committee members report annually on each student before the progress review, and committees report each time they meet (e.g., for a milestone defense). Faculty advisors provide written feedback for students on the materials submitted for the annual review.

Progress standards and student standing. Students must demonstrate regular progress to maintain good standing in the Ph.D. program. An important function of the annual progress review is to identify students who are not making adequate progress in the judgment of the faculty as a whole. The faculty will communicate clear progress expectations to at-risk students, together with a schedule for meeting specific goals and milestones. If a student does not meet the standards for progress set by the faculty,

then the faculty may determine that the student will withdraw from the program. Students have the right of a formal appeal in writing to the Graduate Executive Committee, which includes the Department Chair, Associate Chair, the DGS, the Graduate Program Coordinator, and other members appointed by the Chair.

Review schedule. In a typical year, supporting materials will be due near the end of January, and the faculty will complete the annual progress review in mid-February. The faculty may request progress steps from at-risk students due no less than eight weeks after notifying the student. Decisions on withdrawal are made shortly after the expiration of a progress deadline.

First-Year Mentoring

Faculty mentor. The Admissions Committee and DGS pair each entering student with a member of the CPS faculty who will act as a *faculty mentor*. The faculty mentor shall meet with the student early in each semester, and additionally as appropriate. The responsibility of the faculty mentor is to discuss the student's research interests and goals, and guide the student toward a suitable match with a research advisor. The faculty mentor also reports on the student's progress as input to the annual review, if the student has not yet named an advisor.

Guidelines for Milestone Reports and Defenses

The graduate degree programs define research milestones in which the student prepares a *written report* for an approved supervisory committee, and defends the work in a *public presentation*. Written reports and defenses are required for the preliminary exam and doctoral dissertation, for Master's theses and projects, and for the Research Initiation project proposal and final project report. The supervisory committee has discretion to set standards for content of the written report and presentation. It is critical that students discuss expectations with each committee member in advance.

Report standards and publication. All reports are published on an internal department Web site, and are expected to meet presentation standards suitable for publication. The Graduate School defines formatting standards for theses and dissertations, and publishes them externally. Students are encouraged to publish completed technical work in refereed conferences and journals and/or as technical reports.

Defense. A defense has three phases: (1) the student gives a prepared public presentation and answers questions from the committee and other attendees; (2) the student discusses the work with the committee in a private session; and (3) the committee discusses the work in a private session. Other faculty members may attend the private sessions with the approval of the committee.

Scheduling. The student is responsible for negotiating with committee members to schedule and announce each milestone defense and to file the necessary paperwork in conformance with published deadlines. The DGS office assists with this process. Students should begin the process early: scheduling is often time-consuming and difficult toward the end of a semester, and the Graduate School requires filing of *Intent to Receive Degree* forms well before the end of the semester in which a degree is received.

Students should allow adequate time to incorporate review comments from the advisor before submitting a report to the committee, and adequate time to incorporate review comments from committee members

before the report is due. Students will submit reports to committee members for final review at least two weeks in advance of the milestone defense, unless they agree to accept it later.

Length. Supervisory committee work places a significant load on faculty members. Students should minimize this burden by presenting the required information in a compact and well-organized form. In addition, students must allow adequate time for all three phases of the defense when scheduling the defense and preparing the presentation.

This document defines *standard length* guidelines for reports and presentations for each research milestone. *The standard lengths are only guidelines.* Minor deviations from these guidelines are common and expected. Committees have discretion to request or permit significant deviations from the standard length guidelines, although these must be negotiated in advance. The student may provide additional material such as supplementary report text or publications for consideration by the committee.

Standard length guidelines for reports apply to documents in the standard thesis format defined by the Graduate School. However, there is no departmental requirement to use the standard thesis format for reports. Some faculty members prefer a single-spaced format with wide margins.

Research Initiation Projects

The *research initiation project* requirement for the Ph.D. program is intended to engage students in early research work with specific progress goals and a review by a committee. Although the proposal and review may be delayed until the second year, students are encouraged to start research work as early as possible.

Length. Standard report length for a research project report is 30 pages. Standard length for a research project review is 25 minutes of prepared presentation time in a one-hour time slot. Standard length for a research project proposal is a five-page written report and a 15-minute presentation in a 30-minute time slot.

Publication of project reports. All accepted project reports are published on an internal web site.

Research project award. The department regularly grants a formal award with a cash prize for initial research work of outstanding merit. The faculty selects recipients of the award by consensus in an open competitive process coordinated by the DGS.

Preliminary Exam

Timing. The Graduate School mandates completion of Ph.D. preliminary exam defenses by the end of the third year. If a student does not plan to complete the defense on time, the faculty considers during the annual progress review whether to request an extension from the Graduate School. The faculty will give priority to external publication of research results; students who are actively publishing may request prior approval for an extension on the preliminary examination if necessary.

Content. The preliminary exam covers material in the student's selected area of concentration and a selected research topic approved in advance by the committee. The candidate's report frames the research topic, surveys the literature pertaining to the topic, and presents an independent synthesis and/or

evaluation of the previous work, often including the candidate's own research. The prepared presentation summarizes the content of the report and may provide additional supporting detail in selected areas. The committee must judge three criteria for a successful defense: (1) the candidate has mastered previous work in the area; (2) the candidate demonstrates sufficient aptitude and mastery of research methods and tools; and (3) the candidate's independent work meets standards of scholarship and presentation necessary to earn a doctoral degree.

Length. Standard length for a preliminary exam report is 30 pages. Standard length for a preliminary exam defense is 50 minutes of prepared presentation time in a two-hour time slot.

Publication of preliminary reports. All preliminary reports are published internally on a departmental web site, and may be published as technical reports with the approval of the student and committee.

Preliminary exam award. The department regularly grants a formal award with a cash prize for completed preliminary research of outstanding merit. The faculty selects recipients of the award by consensus in an open competitive process coordinated by the DGS. The selection process considers each candidate's publication record and time in the program as well as the preliminary report and presentation.

Ongoing Committee Communication. Doctoral candidates should provide regular written progress summaries (e.g., e-mail messages) to their committee members. These summaries should include plans for completion of the dissertation as they evolve. Each committee member provides a brief written statement regarding the candidate's progress as input to the annual progress review.

Theses and Dissertations

Content. A thesis or dissertation presents research that makes a substantial contribution to knowledge. The supervisory committee has full discretion to define content standards for theses and dissertations.

Length. There are no standard length guidelines for theses and dissertations; individual circumstances vary widely. Standard length for a final defense is 50 minutes of prepared presentation time in a two-hour time slot.

Publication of theses and dissertations. The Graduate School publishes all theses and dissertations. Students must format theses and dissertations according to standards set by the Graduate School, and must present a draft of the document for a *format check* as required by the Graduate School.

Awards. The department regularly grants a formal award with a cash prize for completed theses and dissertations of outstanding merit. The faculty selects recipients of the award by consensus in an open competitive process coordinated by the DGS.