COMPUTER SCIENCE GRADUATE STUDENT HANDBOOK

Revision: 2025.02

Department of Computer Science

School of Engineering and Applied Science

Rice Hall and Olsson Hall

University of Virginia

Charlottesville, VA 22904

Changelog

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- Feb 2025: Converted to Latex based on 9/16/2024 (Google doc). Minor format adjustment.

Contents

1. Introduction

Welcome to the Computer Science Graduate Program at the University of Virginia. This handbook has been designed to help students (and faculty) navigate the policies, procedures and requirements for Master's and PhD degree programs in Computer Science. It contains information about degree programs, financial support, academic regulations and procedures, and information for international students. It is intended to *supplement* (not replace) the *School of Engineering and Applied Science (SEAS) Graduate Degree Requirements* and *UVA Graduate Record*.

General information about the Computer Science Graduate Program can be found on the Department's web site. The Computer Science Graduate Student Group (CSGSG) is another source of information. Refer to Appendix A to find URLs for all information resources and forms mentioned herein. Appendix B is our current policy on absences for Graduate Teaching Assistants (GTAs) and Graduate Research Assistants (GRAs). Appendix C describes the process we use in the rare instance where a GRA's performance is unsatisfactory.

On rare occasions and with good reasons, a policy or requirement can be waived by the Master's Graduate Program Director (MGPD) or the PhD Graduate Program Director (PGPD). When the text below mentions the Graduate Program Director (GPD), then it refers to either the MGPD or the PGPD.

The Department of Computer Science offers three graduate degrees in the School of Engineering and Applied Science (SEAS).

- *Doctor of Philosophy (PhD).* The PhD program is designed for students interested in academic positions in colleges/universities and/or research positions in industrial or commercial labs.

- *Master of Science (MS).* The MS degree introduces students to research at the graduate level with a focus on proposing, executing, and then documenting a research experience with a formal, written thesis and oral presentation.

- *Master of Computer Science (MCS).* The MCS degree is a graduate professional degree with an emphasis on coursework. It enhances the knowledge obtained in an undergraduate program by providing students with broader knowledge and a deeper technical understanding of Computer Science concepts.

For reference:

- Master's Graduate Program Director (MGPD): Prof. Felix Lin, xl6yq@virginia.edu

- PhD Graduate Program Director (PGPD): Prof. Felix Lin, xl6yq@virginia.edu

- Ombudsperson: Prof. David Evans evans@virginia.edu Rice 507 and Prof. Nada Basit basit@virginia.edu Rice 405

- Graduate Coordinators: Jai Maupin, jm3xe@virginia.edu, and Marion Hight, qnx5re@virginia.edu.

- CS Department Chair: Sandhya Dwarkadas, bay7xc@virginia.edu , Rice 521

- CS Director of Operations: Debbie Rose, dcr4f@virginia.edu , Rice 526

- Chair of Graduate Admissions Committee: Prof. Matt Dwyer, md3cn@virginia.edu , Rice 424

- SEAS Director of Graduate Programs: Dr. Amy Clobes, amc5hu@virginia.edu Thornton A109

2. Master's Degrees

Master of Science (MS) degree: a student completes coursework and conducts independent research overseen by a professor which requires a written thesis and oral defense; the level of research effort is commensurate with **two** typical academic courses.

Master of Computer Science (MCS) degree, which either focuses on *all coursework* (the student performs no independent research) or involves a *project* (student conducts independent research overseen by a professor where the level of research effort is commensurate with **one** typical academic course).

Note: A Master's Degree student is assigned an academic adviser upon entering the program. If the student selects either an MS or MCS (project) degree, their research adviser then becomes the academic advisor.

Terminology. In this document, "Master's degrees" refer to MS, MCS (project), and MCS (coursework); "MCS" refer to both MCS (project) and MCS (coursework).

2.1 Master's Degree Requirements

MS degree. Please refer to the University's Graduate Record for degree requirements for the **MS** in Computer Science:

https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5367

The MS Examining Committee requirements can be found in the University's Graduate Record:

https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5418#committee-requirements

MCS degree. Please refer to the University's Graduate Record for degree requirements for the MCS degree:

https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5367

2.2 Master Teaching Assistant Positions (MTA)

Depending upon demand, Master's students (typically those in their second year) may have the opportunity to apply for a limited number of *Master Teaching Assistant (MTA)* positions. An MTA is an excellent way to gain teaching experience and supplement income. MTA positions pay an hourly wage with no other benefits.

MTAs typically help a professor by grading assignments and exams, holding office hours, etc. It is UVA policy that all graduate TAs whose first language is other than English must first take the SPEAK test to assess their fluency with oral English and to determine the types of actions which they may perform. See section 4.2.

2.3 En Route Master's Degree

A current PhD student can obtain a CS Master's degree along the way to the PhD degree by completing all the requirements for the Master's degree. A PhD student terminating the PhD program before graduation can also obtain a Master's degree if he or she has completed all requirements for the degree. In either case, confer with the MGPD and the Graduate Student Coordinator.

2.4 Typical Timeline

In description below, "Master's students" refer to students of MS, MCS (project), and MCS (coursework); "MCS students" refer to student of MCS (project) and MCS (coursework).

Most students finish within three or four semesters. However, the official deadline to complete a degree is 5 years for an MS student and 7 years for an MCS student. In response to the COVID-19 pandemic, students registered in the MS program in Spring 2020 have a deadline of 6 (rather than 5) years; the deadline for MCS students is unchanged.

UVA policy is that all students whose first language is other than English who wish to serve as an MTA or a GTA must take the UVELPE Oral (formally known as SPEAK) test upon arrival.

First semester (Fall): All first-semester Master's students take CS 6190 (Computer Science Perspectives) for 1 credit and 4 graded, 3-credit graduate courses (total 13 credits). MS and MCS (project) students should use this semester and CS 6190 to learn about the active research projects in the department, discuss potential MS/MCS research ideas with prospective faculty research advisors, and finalize a plan and research advisor for the MS or MCS (project) degree.

Second semester (Spring): MCS students typically take 4 graded courses (12 credits). MS students typically take 3 graded classes and 3 credits of CS 8999 (Thesis) with their thesis advisor.

Summer: Students typically are away on internships, potentially facilitated through the SEAS *Center for Engineering Career Development*. International students use the Curricular Practical Training program (CPT) organized through the UVA *International Studies Office* (ISO) and the *International Students and Scholars Program* (ISSP).

Third semester: Master's students typically take the remaining courses necessary to fulfill their academic requirements. An MS student typically takes 3 credits of CS 8999 (Thesis) with the research advisor in this semester (in addition to the 3 credits of CS 8999 taken in the previous Spring semester). An MCS (project) student typically takes CS 7995 (Supervised Project Research) with the research advisor in this semester.

Students must use SIS to apply for graduation with a Master's degree at the start of the semester during which they expect to graduate – usually no later than 1 October (Fall), 1 February (Spring), or 1 June (Summer). Students should check their completion of the requirements using the Academic Requirements tool within the *Student Information System* (SIS). Two special situations may also occur toward the end of Master's studies:

1. If a Master's candidate changes their mind and wishes to defer graduation for another semester, the student should consult with the MGPD for advice and assistance.

2. If a Master's student wishes to pursue a PhD in UVA CS, it is necessary for the student to identify and confirm with a CS professor that he or she is willing to fund and advise the student's academic career. The Master's student should then consult with the Chair of the CS Graduate Admissions Committee (see Section 1) to determine the necessary forms and procedures used to apply to our PhD program. Once these application forms have been filed, the CS Graduate Admissions Committee will determine whether to offer admission to the PhD program.

3. PhD Degree

There are a number of steps that are required for a PhD degree, including coursework (section 3.1), possibly transferring courses from another University (section 3.2), finding an advisor via the first-year rotation program (section 3.3), the PhD qualifying exam (section 3.4), forming a PhD Committee (section 3.5), writing and presenting a PhD proposal (section 3.6), writing a PhD dissertation (section 3.7), presenting a public defense of the dissertation (section 3.8), and completing four semesters of half-time work (or equivalent) as a GTA (sections 3.9 and 3.10). A typical PhD timeline is described in section 3.9 and financial support options are discussed in section 3.10.

Terminology. A person who has an undergraduate degree and who wishes to pursue a PhD is known as a *PhD student* or a *doctoral student*. That person advances to the status of *PhD candidate* or *doctoral candidate* after completing all coursework and passing the PhD Qualifying Examination.

3.1 PhD Coursework

Please refer to the Graduate Record for PhD degree requirements:

https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5367

3.2 PhD Transfer Credit

If a graduate student enters the CS PhD program *with a Master's degree in a computing field*, they will receive 24 bulk transfer credits.

- At least 6 additional credits of graded, graduate-level CS coursework must be taken at UVA (i.e., they cannot be transferred). A minimum grade of "B" is required.

If entering *without a Master's degree*, then a maximum of 6 credits of graded, graduate-level CS coursework may be transferred. Transferred credits must not have been used to fulfill the requirements of any other degree.

Whether any individual transfer course counts toward our PhD degree breadth requirements is determined by the PGPD. Students are encouraged to take additional courses beyond those required for graduation.

Please refer to the *UVA Graduate Record* for more information:

https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5418#transfer-credit

3.3 First-Year PhD Rotation Program

Entering PhD students (but not including students who transfer into CS from another UVA department or another institution's PhD program) are usually supported with a First-Year Fellowship during their first academic year to enable students to investigate multiple potential research advisors and take CS graduate classes. There are no other duties assigned to these fellowship students.

Effective Fall 2023, the rotation program will consist of two rotations instead of three. Rotation 1 will be the fall semester's duration, and Rotation 2 will be the spring semester. This change is to better align with the fall and spring semesters and credit hour registration.

Students will work with the faculty member who championed their PhD admission for the first rotation unless the student reaches an agreement with another faculty member.

In each rotation, the student conducts a short research project with that professor, attends the professor's group meetings, etc. The goal of a rotation is to help the student and professor determine if there is a good match for the purpose of the professor directing the student's PhD research.

The typical schedule for each rotation is as follows:

- Early in a rotation (no later than week 4), through discussions with the rotation advisor, the student is required to write a 2-page proposal to the rotation advisor that contains: what they are doing for their project; why it is important; novelty over prior work by others aimed toward solving the problem being addressed by the project; and how it will be evaluated.

- The middle weeks of a rotation are spent performing the activities described in the proposal. The student should meet with the rotation advisor and/or members of the rotation advisor's research group for design meetings, contingency planning, etc.

- Toward the end of the rotation (no later than week 9), the student should prepare a 4-5-page final report in a workshop or conference submission style. In combination with this report, the student must make a short oral presentation to the rotation advisor and/or members of the rotation advisor's research group.

- Before the end of the rotation, if the student is interested in continuing with the same rotation advisor in the next rotation, the student should prepare a new 2-page proposal for the advisor that may – but is not required to – leverage the experience and results of the current rotation for the next rotation.

Note that the first rotation advisor evaluates the quality of the research and research plan, and that evaluation is used as input for the student's grade in CS 6190 Computer Science Perspectives (a required course).

Upon the completion of a rotation, there are three possibilities:

1.   The student and professor agree to continue permanently, thus taking them out of the rotation process. Then the research advisor (i.e., the rotation advisor) also becomes the student's academic advisor.

2.   The student and professor have not agreed to a permanent match, so the student remains in the rotation program. The student provides a prioritized list of potential advisors with whom they have discussed research opportunities. These preferences are used to match each student with a research advisor for the next rotation. Note that even if the student and the rotation advisor wish to continue for the next rotation, it is not guaranteed that this will happen depending in part on the overall availability of rotation advisors.

3.   If, at the end of the rotation, a student has not made a successful match, then the PGPD and Department Chair will confer with the student regarding what steps should be taken.

For purposes of defining a first-year PhD student's academic advisor, the first rotation supervisor is the Fall semester academic advisor, and the second rotation supervisor is the Spring semester academic advisor.

3.4 PhD Qualifying Examination

The *qualifying examination (quals)* is designed to evaluate a student's ability to pursue and successfully complete graduate-level research. The qualifying examination consists of two parts: breadth (section 3.4.2) and depth (section 3.4.3). The *breadth* portion of the exam helps students obtain broad, graduate-level knowledge in several of the major areas of CS. The *depth* portion of the exam focuses on the student's ability to pursue high-quality independent research and their ability to effectively communicate about research, and requires the student to write a proposal, present it to their quals committee (section 3.4.1), and then complete a nominally one-semester independent research project guided by the student's research advisor.

Students who have already passed their qualifying examinations in Computer Science at a previous institution may petition the Graduate Program Committee for an exemption from the UVA CS qualifying exam upon presentation of acceptable evidence (typically a letter from the previous department).

While the completion of the qualifying exam has no hard deadline, our expectation is that **by the end of the student's third semester** the qualifying examination committee should be formed and approved by the PGPD, and the form filed with the Graduate Student Coordinator. **By the end of the student's fourth semester,** the breadth and depth portions of the qualifying examination should be completed.

3.4.1 Qualifying Examination Committee

~~Each qualifying exam committee must have at least 3 UVA computer science (CS) faculty members, along with an advisor or co-advisors, totaling four members (three CS faculty and one advisor).~~

~~Each qualifying exam committee must have at least ■ UVA CS faculty members, along with an advisor or co-advisors, totaling ■ members ■~~

The committee must consist of at least the student's advisor or co-advisors and two additional CS faculty, totaling at least three members and at least three CS faculty members.

CS faculty are defined as those with primary or secondary appointments in computer science. Faculty with courtesy appointments in computer science do not count toward the required number of CS faculty members on the committee.

The committee must have an explicitly designated chair who will direct meetings and ensure proper procedure. The advisor(s) may not serve as the chair. The chair must be decided well before Phase 1 of the exam.

The student must form the committee prior to scheduling the qualifying exam and submit Doctoral Advisory Committee form to the CS office.

~~For a student entering with a master's degree, the committee should be formed as soon as the student and advisor agree on the research work to be accomplished.~~

211 ~~The committee evaluates the student's research proposal, including the reading list selection. We expect~~
212 ~~examinations to be conducted with the student, advisor and all committee members present. Exceptions to~~
213 ~~his rule can be made in exceptional circumstances.~~

3.4.2 Qualifying Examination Breadth Requirement

215 To satisfy the breadth requirement, a minimum of one course in any four of six topical areas must be taken.
216 The list of courses that are allowed in each of the six areas can be found CS degree programs page ~~at the~~
217 ~~bottom~~ of the Graduate Record: UVA CS Breadth Areas and Courses

3.4.3 Qualifying Examination Depth Requirement

219 ~~The depth component of the qualifying examination proceeds in three phases. In phase one, students hold a~~
220 ~~meeting with their committee members to gather advice concerning the proposed topic, work, reading list~~
221 ~~and timeline. No written documentation of this meeting is required.~~

222 The depth component of the qualifying examination proceeds in two phases. First, the student prepares a
223 written and oral research proposal for an independent research project and presents this proposal to their
224 evaluation committee. Second, the student completes the proposed research, prepares a written and oral
225 project report, and presents the results to their evaluation committee. In both phases the committee provides
226 feedback and determines the phase outcomes.

227 The proposal process is intended to assist the student in the formalization of the research project and to
228 ensure that the student is not undertaking too much or too little work, and that prior work has been properly
229 examined and understood.

3.4.3.1 Qualifying Examination Depth Proposal

231 For the depth proposal the student prepares a written proposal document and oral presentation. The student
232 should propose a research project that can be completed in approximately one semester. The proposal must
233 also include a specific reading list (section 3.4.3.1.1).

234 ~~Writing a qualifying examination depth proposal is an important step in the student's academic development.~~
235 To help develop the student's ability to propose new research, the proposal must *not* be a previously submitted
236 or published paper, or an existing paper that has been reformatted with minor edits (e.g., to recast work
237 already completed as if it were work to be performed in the future). The proposal *can* be based upon
238 individual or group research already accomplished if the proposal is for meaningful extensions of that work to
239 be performed solely by the student. The student shall disclose their papers that are related to the proposal
240 (including ones published, under review, or on arxiv) to the committee.

241 The quals depth proposal must have only one author (i.e., the student). While the advisor may help with
242 revisions, the proposal must ultimately represent the student's own efforts.

243 For the oral presentation the student must schedule a meeting with their qual evaluation committee. The
244 proposal defense is not open to the public. During the meeting, the student starts with a ~20-minute
245 presentation about the proposed work, followed by questions from the committee members about the proposed
246 work and the reading list.

247 The student should inform the Department Coordinator of their scheduled proposal ~~when they have scheduled~~
248 at least one week before their Qual Proposal.

249 In preparation for the depth proposal, students are encouraged to communicate with their committee members
250 to gather advice concerning the proposed topic, work, reading list and timeline. ~~No in-person meeting or~~
251 ~~written documentation is required.~~

252 ~~Phase ██ ██ is the formal review of the proposal (written and oral) and reading list; however, this proposal~~
253 ~~defense is not open to the public.~~

254 ~~Phase ██ ██ (the qualifying examination final report and presentation) is discussed in sections 3.4.5-3.4.7.~~

3.4.3.1.1 Qualifying Examination Proposal Document

Qualifying Examination Research Proposal. The student's proposal document should be sufficient for the committee to evaluate the research quality of the proposed project. As such, it should contain the following elements:

> **Abstract.** An executive summary, no more than one-half page.

> **Motivation.** What is the problem and why is it important?

> **Hypothesis.** What is the hypothesis of the proposed research?

> **Contributions.** What are the main ideas and why do they matter? In what way are these ideas novel?

> **Related work.** What is the relevant prior work and state-of-the-art in this area?

> **Detailed research plan.** What specific goals or milestones will be completed during the research project and how will they be implemented, designed, and evaluated? For projects with a significant implementation component, give enough details of the features to be implemented and the experimental setup involved for the committee to judge the feasibility of the proposed work. For projects with a significant formal component, give enough details of the formalisms used (e.g., proposed theorems, proof schemas, and logical frameworks) for the committee to judge the feasibility of the proposed work. Note that the research plan must explain how the research is to be evaluated (i.e., what are the metrics of success?).

> **Summary and Future Work.** A short summary of the above, and identification of potential future work.

~~The ordering of the sections above may vary depending on the committee's preferences. Many proposals also include a section devoted to the work completed by the student prior to the proposal.~~

~~If as part of executing the proposed project results in significant deviations from the proposal, such changes need to be discussed with the committee.~~

~~These committee meetings are informal and are intended to be helpful.~~

Qualifying Examination Reading List. The qualifying exam proposal should include a reading list that the oral examination may cover. The student and advisor should prepare an initial reading list, which should be included as an appendix in the proposal document. ~~During the initial meeting, the committee may make changes or additions to the reading list.~~

The reading list should include:

> **Focus papers**. A small number of papers (typically two or three) representing the area's state of the art. The student will be expected to know these papers in detail.

> **Background readings**. Typically, a textbook and/or one or two book chapters or survey papers. The student will be expected to have a firm command of the material covered in these readings, as shown through general understanding and an ability to place the work in context.

> **Related works**. ~~The proposal (and later project report) bibliography comprises the rest of the reading list. The student should understand the main idea of each such paper, why that paper is cited, and its relevance to the proposed research.~~

3.4.3.1.2 Qualifying Examination Proposal Outcomes

~~the committee may request amendments or changes and set appropriate due dates or indicate weaknesses in the proposal that must be addressed in the final report and presentation. The committee will also indicate deadlines for any required revisions.~~ The possible outcomes of the qual depth proposal are:

1. The student may proceed to phase two. In this case, the committee may request amendments or changes, make changes or additions to the reading list, set appropriate due dates, and/or indicate weaknesses

299 in the proposal that must be addressed in the final report and presentation. The committee will also
300 indicate deadlines for any required revisions.

301   2. The student may not proceed to phase two and should re-attempt the proposal.

3.4.3.2 Qualifying Examination Depth Defense

303 The qualifying exam, conducted by the approved qualifying examination committee, consists of (1) verification
304 of the coursework that fulfills the *breadth* requirement, (2) review of the project's report written by the
305 student, and (3) a final public oral presentation of the research.

306 The qual exam depth defense requires the student (1) to write a project report about their qualifying exam
307 research and (2) complete an oral presentation.

308 Before the qualifying exam depth presentation can be scheduled, the CS staff must verify the student has
309 fulfilled the *breadth* requirement. The approved qualifying examination committee will then review (1) the
310 project's report written by the student, and (2) the final public oral presentation of the research.

3.4.3.2.1 Qualifying Examination Depth Defense Report

312 The student must prepare a written research report based on their research project.

313 Students must email their written report to all committee members (email is sufficient) at least 7 days before
314 the qualifying exam.

3.4.3.2.2 Qualifying Examination Depth Defense Presentation

316 The student must present their research project outcomes to their examination committee. Two hours should
317 be allocated for the presentation. The presentation begins with the student's ~30-minute overview of the
318 project, followed by questions from the general audience. The committee will ask questions about the research
319 project and about material from the reading list.

320 To prepare for the presentation, the student should be ready to answer questions about their depth area in
321 general and their research project in particular. The student should be:

322   • able to explain the main idea, conclusions, and relevance of any paper in their report's bibliography. The
323   student is not expected to be completely familiar with every detail of every paper in the bibliography.

324   • familiar with the papers from their reading lists. These papers represent the state-of-the-art in the
325   area, and the student will be held to a higher standard for these papers. Deep questioning regarding
326   them should be expected.

327 The presentation should use numbered slides. The student should distribute the presentation in electronic
328 form a few days in advance of the presentation or printed out and distributed at the oral examination itself to
329 the committee the day before the defense presentation. Providing numbered slides is a courtesy that helps
330 the committee follow the presentation and keep track of their comments.

331 The student's qualification exam presentation to the committee is open to the public and must be publicly
332 announced at least one week in advance by the Graduate Student Coordinator.

333 The student should work with committee members to find a time when all members can attend. The student
334 must also arrange for the Graduate Student Coordinator to publicize the time, date, place, committee
335 members, and abstract to the CS Department. The Graduate Student Coordinator will prepare and send the
336 qualifying exam forms to the committee the morning of the presentation.

337 At the end of the depth defense the committee deliberates and decides on an outcome.

3.4.3.2.3 Qualifying Examination Depth Outcomes

339 Based upon the student's final project report and oral presentation, the examination committee determines if
340 the student passed the depth portion of the qualifying exam. If the student's performance is not acceptable,

341 the committee may permit a second attempt, in which case the exam *must be re-taken within 60 days*
342 (excluding holidays or days when the University is not in session). At most two attempts are allowed.

343 ~~Based upon the student's performance on both the breadth and depth components of the qualifying exam,~~
344 ~~the quals committee decides if the student has passed the overall (breadth and depth) qualifying examination.~~

3.5 PhD Committee

346 For PhD SEAS general Committee requirements, please refer to the University's Graduate Record:
347 https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5418

348 A PhD student's PhD Committee evaluates the student's PhD dissertation and oral defense and must
349 consist of a minimum of five faculty members constituted according to the following rules. Membership must
350 include at least three Computer Science faculty members, at least one UVA faculty member from outside the
351 Computer Science department and at least one other member with expertise in the research area. (3 CS
352 faculty + 1 UVA faculty(outside CS) + 1 outside expert)

353 The Department recommends that one of the committee members be an expert from outside the University
354 (who should submit a biography in advance to permit prior approval by SEAS).

355 The PhD student's advisor must have read and approved the dissertation proposal document and the proposed
356 presentation before the Oral Examination is scheduled.

357 The Doctoral Advisory Committee form should be completed once the PhD Proposal Committee is formed
358 and submitted before the proposal defense. Students are encouraged to meet with each potential committee
359 member before scheduling the proposal to discuss the scope of their proposal.

3.6 PhD Proposal

361 A PhD student must develop a written dissertation proposal, created under the guidance of the student's
362 advisor(s). This proposal should be presented to the student's PhD Committee prior to performing extensive
363 research, to receive early faculty approval of the suitability of the proposed research. It is recommended that
364 the proposal be completed by the end of the third year.

3.6.1 PhD Proposal Document

366 The student's PhD proposal document *should have the same structure as the PhD Qualifying Examination*
367 *Proposal Document* (section 3.4.4) and should clearly and unambiguously convey the scope of the work and
368 the criteria for success. Proposals can also include a section devoted to the student's work thus far, although
369 this section is not formally required.

370 Proposal documents should not exceed 15 single-spaced pages (or 30 double-spaced pages). The bibliography
371 and any appendices (appendices are not required to be read by the student's committee) are not included in
372 this page limit. Significant departures from these guidelines must be approved in advance by the student's
373 proposal committee. The written proposal document must be submitted to the committee at least two weeks
374 in advance of the proposal presentation. Students are encouraged to follow the National Science Foundation
375 (NSF) grant proposal formatting guidelines.

3.6.2 PhD Proposal Presentation

377 The PhD Proposal Oral Presentation must be publicly announced at least *two weeks* in advance via the
378 Graduate Student Coordinator.

379 The PhD proposal meeting should be scheduled for 2 hours. The proposal presentation should be about
380 30-45 minutes, as the committee members are assumed to have read the proposal. After the presentation,
381 the committee members discuss the proposed work, ask questions, and offer suggestions or identify required
382 changes. The Graduate Student Coordinator will send *"Dissertation Proposal and Admission to Candidacy"*

and *"Engineering Dissertation Proposal Assessment"* form to the student's committee the morning of their presentation.

Students are encouraged to provide the committee members with copies of the slides used in the proposal presentation. Slides can be distributed in electronic form a few days in advance of the presentation or printed out and distributed at the presentation itself. Providing *numbered* slides is a courtesy that helps the committee follow the presentation and keep track of their comments.

3.6.3 PhD Proposal Outcomes

After the proposal meeting, there are several possible outcomes:

- The proposal is accepted without changes.

- The proposal is not accepted until amendments to the written document are made and approved by all committee members.

- The proposal is not accepted, and the student will need to write another proposal or modify the work proposed.

- The proposal is not accepted, and the committee indicates that the student does not have sufficient research potential to complete a dissertation in a timely fashion; in this case, the student is subject to dismissal from the program.

Once accepted, the proposal is a binding document on the committee. If the student competently carries out the work described therein, the committee will not reject the student's PhD dissertation on the grounds that too little has been done. It is not binding on the student, who is free to adjust the research plan. However, there is no guarantee that research other than that outlined in the proposal adjusted will be of sufficient depth and quantity to satisfy the PhD requirements: students adjusting research plans should thus confer with their committees. Significant departures from the proposed work *must* be approved in advance by the committee.

3.7 PhD Dissertation

The dissertation should convey the research hypothesis, research paradigm, and research results and then defend the proposition that the results are valid and correct. The exact form of the dissertation can vary across topics, but in general a dissertation will include the following elements:

- Presentation of the motivation, hypothesis, and contributions of the research.

- Placement of the work in the context of prior art.

- An explanation of how the proposed work was carried out.

- Where applicable, the experimental design of any experiments should be provided which provides enough information for the reader to replicate the results.

- Conclusions drawn from the work and a discussion of future research directions suggested by the project.

A dissertation should be a self-contained document. It should not assume that the reader has read the corresponding proposal, so it should provide enough context that a reader who has read the proposal can readily understand how the performed work fulfills the promises in the proposal. Parts of the proposal can be included in the dissertation.

The written dissertation document must be submitted to the committee at least two weeks before the oral defense.

3.8 PhD Defense

The dissertation defense, which must be announced publicly two weeks in advance via the Graduate Student Coordinator, is an oral defense before the student's PhD dissertation committee and other faculty, students, and visitors. Generally, a defense should be scheduled for at least two hours to allow for audience questions and a post-presentation discussion by the committee.

Before the defense, students are encouraged to give committee members copies of the presentation materials used in the oral defense. These materials can be distributed in electronic form a few days in advance of the presentation or printed out and distributed at the defense itself. Providing *numbered* slides is a courtesy that helps the committee follow the presentation and keep track of their comments.

A typical defense at UVA CS comprises the following components:

- Presentation. It should not exceed 45 minutes. During the presentation, questions from the committee and other audience members are expected.

- Q&A. The committee and other audience raise questions for the candidate to answer.

- Deliberation. The committee members have closed-door discussion; the candidate and other audience shall be excused.

- Announcement of the outcome. The committee chair notifies the candidate of the decision and any requirements or comments.

The Graduate Student Coordinator will send the *Report on Dissertation or Thesis Final Examination* and *Engineering PhD Dissertation Assessment forms* to the committee the morning of the presentation. The student must also complete the *Survey of Earned Doctorates* and must submit the dissertation electronically to LIBRA at the UVA Library.

3.8.1 PhD Defense Outcomes

Based upon the student's dissertation document and oral exam, the dissertation committee will either:

- approve the dissertation, indicating the student has passed the dissertation defense component of the PhD degree, and fill out the forms indicating approval, or

- require amendments to the written dissertation and hold the evaluation forms until the changes are made satisfactorily, or

- specify significant amendments to the dissertation to be followed by a new defense, or

- declare the work unsatisfactory and dismiss the student from the program.

Students should double-check their completion of their requirements using the Academic Report option offered by the Student Information System (SIS) website.

To receive a PhD degree, students must apply for graduation using SIS at the start of the semester during which they expect to graduate.

3.9 Typical Timeline

If entering without a Master's degree:

- First semester: Take graded, graduate-level courses, CS 6190, and CS 8999 with Rotation One advisor.

- Second semester: Take graded, graduate-level courses and CS 8999 with Rotation Two advisor. Match with a research advisor.

- Third semester: Take remaining coursework. Form a qualifying examination committee and submit form. Work with your research advisor (CS 8999). Work as half-time TA and take CS 8897 (Graduate Teaching Instruction).

- Fourth semester: Work as half-time TA and take CS 8897 (Graduate Teaching Instruction). Continue working with research advisor (CS 8999). Take Qualifying Examination to fulfill depth requirement and certify completion of the breadth requirement.

- Fifth semester and beyond: If the Qualifying Examination has been successfully completed, then take CS 9999; otherwise take CS 8999. Prepare and defend the Dissertation Proposal. Execute the work proposed for the dissertation. Finally, write the dissertation and pass an oral defense.

- Submit dissertation electronically to LIBRA and submit the survey of earned doctorates.

If entering with a Master's degree:

- Present appropriate documentation (e.g., transcript) for your Master's degree in a computing field. SEAS will make a "bulk transfer" of 24 credits (regardless of the actual number of credits taken for the Master's degree). Before choosing your two additional CS courses required to be taken at UVA, verify that the graduate courses taken for your Master's degree also fulfill our Qualifying Examination breadth requirement (consult the PhD Graduate Program Director). If the breadth requirement is not completely satisfied by the graduate courses taken elsewhere and used to generate the 24-credit "bulk transfer," then choose courses as necessary to fulfill the breadth requirement. You must complete a minimum of 6 credits taken at UVA.

- If you passed a PhD Qualifying Examination *in Computer Science* at a previous institution, you may petition the Graduate Study Committee to waive the depth portion (but not the breadth portion) of the CS quals and present appropriate documentation (e.g., a letter from the previous institution).

- If you took an equivalent course to our CS 6190 (Perspectives), submit appropriate documentation (e.g., transcript) and you will be exempted from our requirement of CS 6190 (3 credits).

- If you are entering as a third-year (or later) PhD student, you can request an exemption from CS 6190 from the PhD Graduate Program Director.

- As soon as practical, form your PhD Dissertation Advisory Committee and file the appropriate form.

- Prepare and defend your PhD Dissertation Proposal. File assessment paperwork when satisfactorily completed.

- Complete the work defined in your proposal and then write and defend your written dissertation in an oral presentation. File assessment form when satisfactorily completed.

- Submit dissertation electronically to LIBRA and take the survey of earned doctorates.

3.10 First-Year Fellowship, GRAs and GTAs

A PhD student is usually employed by the department, either as a *Graduate Teaching Assistant (GTA)*, a *Graduate Research Assistant (GRA)*, or via a *First-Year Fellowship*. The First-Year Fellowship provides student support for required duties such as classwork, research, and rotations; as such it represents taxable income (unlike other Fellowships which impose no duties). As per SEAS policy, a funded student is not allowed to have outside employment without permission from the Computer Science Chair and the SEAS Director of Graduate Programs. Full-time graduate students must not unilaterally accept internships without prior approval from their advisor.

With some exceptions, all full-time graduate students with departmental funding must sign up for at least 12 credit hours for both Fall and Spring semesters. CS 6190, CS 6993, CS 7993, CS 7995, CS 8987, CS 8999, CS 9897, and CS 9999 all count toward the full-time requirement.

Stipends increase after successful completion of the PhD qualifying examination, and again after successful completion of the PhD proposal presentation.

3.10.1 First-Year Fellowship

Entering PhD students (excluding transfers into CS from another department) are typically funded in their first year (fall, spring, summer) by a First-Year Fellowship. During this time, students are expected to attend classes, complete any English as a Second Language (ESL) course requirements, conduct research with the rotation advisor(s), and eventually match with a research advisor (see rotation discussion in section 3.3).

3.10.2 Graduate Teaching Assistant (GTA) Responsibilities

Graduate Teaching Assistants (GTAs) are important members of the department's professional teaching staff. GTA responsibilities for each course are assigned by the instructor. Duties typically include grading, proctoring laboratory sections, holding office hours and help sessions, attending class, reading instructional materials, completing assignments, answering email or forum questions, and tutoring students in need of additional help. GTAs may also contribute study questions or examination questions at the discretion of the instructor. GTA assignments are made by the Graduate Student Coordinator early in the semester (and may change early in the semester) and are accompanied by an expected number of hours the GTA should devote to each course. GTAs without a firm grasp of course concepts should obtain guidance from the instructor or request a change in course assignments from the CS staff when given the course assignment. Students concerned that specific duties of the GTA are inappropriate/off-topic or require more effort than allocated may seek resolution through the course instructor, their advisor, or the Graduate Student Ombudsman.

PhD students are *required* to serve as GTAs as a component of their degree. A GTA must sign up for 3 credit hours of CS 8897/9897 (Graduate Teaching Instruction), using the specific section assigned to the instructor, for each 10 hour/week segment. PhD candidates (those who have already successfully completed the Qualifying Examination should enroll in CS 9897; otherwise use CS 8897. GTAs assigned to multiple courses should split the amounts among those courses at their discretion, noting that it is not possible to sign up for fractional credit hours. Completion of the GTA portion of the PhD requirement is signified by having accumulated 12 credit hours of CS 8897/9897, typically over Year 2 and Year 3 of PhD studies.

GTAs are representatives of the Department and the University. As such, they are expected to behave with professional courtesy and politeness in all their official communications and activities, including handling student questions in a polite, constructive, inclusive, and accurate manner. GTA conduct is governed by the general conflict of interest policies of UVA.

The period of GTA engagement begins at the start of each semester and lasts until course final grades are submitted to the registrar. GTAs should be reliable in all their duties. Non-emergency absences from scheduled duties within that time must be approved by the course instructor and PGPD. As an example, GTAs may not depart before final exams are graded and course grades are submitted without the advance approval of their instructor and the PGPD.

3.10.3 Graduate Research Assistant (GRA) Responsibilities

PhD students receiving research funding through one or more professors are called Graduate Research Assistants (GRAs). Much of a typical PhD student's academic tenure is spent as a GRA. GRAs and advisors are colleagues in research and the employer-employee relationship is rarely visible as they work together to engage in a research project. While a GRA officially a 20 hour/week position, with respect to funding, success in graduate school requires substantially more effort. For instance, a student is expected to devote at least 3 hours/week outside the classroom for each academic credit. In general, a GRA is expected to work as directed by his or her research advisor. However, a student who is concerned that specific duties are inappropriate, or off-topic may seek resolution with their research advisor or the PhD Graduate Program Director or the Graduate Student Ombudsman. GRAs are expected to be physically present from the first day of classes until the last day of exams. All absences must be approved by the research advisor and must conform to the School of Engineering's policy regarding graduate student leave.

3.10.4 Summer Support

Students may wish to gain direct experience with government or industrial research through summer internships (during any summer). A student interested in an internship should get the approval of his/her advisor. Graduate-level summer internships often lead to a publication, provide external committee members and help in the student's evaluation of possible careers. Research advisors, the SEAS Center for Engineering Career Development, and the UVA Career Center can help find suitable summer employment. PhD students who do not pursue internships are typically supported over the summer as GRAs (funded by their advisors) and must register as full-time students (6 credits in Summer). Students who have passed the PhD Qualifying Exam take CS 9999; otherwise take CS 8999.

4. Ph.D. Student Assessment Policy and Process

4.1 Policy

The Department of Computer Science is committed to maintaining a strong and nurturing Ph.D. degree program. Toward this goal, the UVA CS Department assesses the progress of each Ph.D. student. The goal of the assessment is to provide the student and advisor with feedback to help ensure the student's success in obtaining a Ph.D. in a timely manner and the achievement of the student's professional goals.

4.2 Process Overview

For every Ph.D. student, their progress and achievements will be reviewed twice a year by their faculty advisor and a separate three-person faculty committee. The result of the committee's assessment will be provided to the student and faculty advisor.

4.3 Ph.D. Student Assessment

A Ph.D. student assessment committee consists of three faculty. Students will be randomly assigned to an assessment committee with the caveat that a student is not assigned to a committee that contains their advisor. The review load will be evenly distributed across the assessment committees.

Student progress will be reviewed twice a year—at the end of the Spring term. For each assessment period, the student will complete a self-assessment form, and their advisor will complete a corresponding advisee assessment form. The student's assessment committee will review both the student's self-evaluation and the advisor's evaluation, and then complete the committee's assessment form.

The committee and student reports will be provided to the faculty advisor for comment. Based on any feedback from the faculty advisor, the committee may, at their discretion, revise their assessment report. When the assessment report is finalized, the advisor meets with the student to review the committee's assessment and to discuss plans to address any concerns raised in the assessment and plans for the next assessment period. Note: To avoid potentially mixed messages and confusion, only the committee's assessment is provided to the student. However, an advisor may choose to provide their assessment report to the student.

4.4 Problematic Evaluations

In the case of problematic assessments, the Ph.D. Graduate Program Director will work with the student and their advisor to determine the appropriate course of action. The Ph.D. Graduate Program Director will also notify the Department Chair of any problematic assessments and recommended actions.

4.5 Confidential Information

If a student desires to provide confidential information for consideration by their assessment committee that they do not wish to be shared with the advisor, the student can provide this information via this feedback form:

https://app.smartsheet.com/b/form/b5cd18894d8d4479a9696ca07530faa3

This information will only be available to the relevant evaluation committee (sans advisor in the case of Senior Ph.D. students), the Ph.D. Graduate Program Director, the CS Graduate Coordinators, and the Department

Chair. If the student is the advisee of the Department Chair (or Graduate Program Director), the confidential information provided by the student will not be shared with the Department Chair (or GPD).

5. International Students

Per the UVA policy, international students should consult with the International Studies Office (ISO) directly regarding matters that affect their legal status.

International Studies Office Website

5.1 Full-Time Status

Please consult with the International Studies Office regarding full-time status requirements:

https://issp.virginia.edu/enrollment

5.2 English Language Proficiency Assessments (Written and Oral)

The Center for American English Language and Culture (CAELC) administers the University of Virginia English Language Proficiency Exam (UVELPE). For more information regarding UVELPE, refer to https://caelc.virginia.edu/assessment.

The UVA Computer Science Department believes that University-provided ESL (English as a Second Language) courses are provided solely for the benefit of the student (about both academics and future employment).

Please refer to the SEAS Graduate Record for language requirements: http://records.ureg.virginia.edu/content.php?catoid=57&navoid=5188#esl-courses

As per CS department policy, students must comply with the ESL recommendations. UVELPE tests and ESL requirements are University requirements and cannot be waived by the CS Department.

5.3 Curricular Practical Training (CPT)

International students should contact the International Studies Office (ISO) when considering a summer internship.

UVA CS Master's and PhD students pursuing CPT should do the following: in the Fall semester *after* the summer internship, register for one credit hour of CS 6890 (Industrial Applications) with their academic or research advisor.

The general requirement of the CS 6890 course is to report on (1) when, where, and with whom the internship was served, (2) what was learned and what new insights were gained, and (3) how the internship experience is expected to assist future academic or employment pursuits. The details and specific requirements of the course are supervised by the advisor. CS 6890 is evaluated as Satisfactory or Unsatisfactory (S/U) and does not count for any of the graduate degree requirements.

In the rare event that a student completes a CPT internship in the Fall or Spring, the student may take CS 6890 that same semester *or* the subsequent semester.

5.4 Optional Practical Training (OPT)

Optional Practical Training (OPT) is available after graduation for students on an F-1 visa. Contact the International Studies Office (ISO) for more details.

APPENDIX A - Useful Forms and Resources

Form or Resource Name	URL
Center for American English Language and Culture (CAELC)	https://caelc.virginia.edu/
Center for Engineering Career Development	https://engineering.virginia.edu/about/offices/center-engin
Computer Science Department Website	https://engineering.virginia.edu/departments/computer-sci
Computer Science Graduate Student Group (CSGSG)	https://csgsg.org
Curricular Practical Training (CPT)	https://issp.virginia.edu/f-1-curricular-practical-training-cp
International Students and Scholars Program	https://issp.virginia.edu
International Studies Office	https://iso.virginia.edu/
Lou's List	https://louslist.org/
NSF Proposal Formatting Guidelines	https://www.nsf.gov/publications/pub_summ.jsp?ods_key
Optional Practical Training (OPT)	https://issp.virginia.edu/f-1-optional-practical-training-opt
SEAS Academic Requirements for Ph.D. Students	https://engineering.virginia.edu/current-students/graduate
SEAS Graduate Forms Page	https://engineering.virginia.edu/graduate-forms
Student Information System (SIS)	https://sisuva.admin.virginia.edu/psc/ihprd/UVSS/SA/s/V
Survey of Earned Doctorates	https://sedsurvey.org/
University of Virginia	http://www.virginia.edu
UVA Computer Science	http://www.cs.virginia.edu
UVA Graduate Record	http://records.ureg.virginia.edu/content.php?catoid=57&n

APPENDIX B – CS Policy on Graduate Student Leave

Please refer to the School of Engineering's Vacation and Leave policy in the Graduate Record:

https://records.ureg.virginia.edu/content.php?catoid=62&navoid=5418#vacation-and-leave

We strive to create a friendly, cooperative, and professional relationship among graduate student assistants and faculty mentors regarding both education and research.

It is expected that GTAs will be available during the entire semester, from the inception of class planning until grades are submitted. This is encumbered by the many changes in GTA assignments that occur at the beginning of each term. Nevertheless, as soon as a GTA is assigned to a course, the GTA should contact the instructor to determine his or her duties, clarify whether class attendance is required, and learn the instructor's plans and timing for final exam grading and final grade submission. Absences other than acute illness should be approved in advance by the instructor. Consistent with UVA policy, the instructor will determine whether the GTA's activities are to be performed in person or via telepresence.

GRAs work directly with their dissertation supervisor. GRAs should be in frequent contact with their supervisor to determine research assignments, publication deadlines, and expectations for on-grounds vs. electronic participation. Absences other than acute illness should be approved in advance by the supervisor. Consistent with UVA policy, the supervisor will determine whether the GRA's activities are to be performed in person or via telepresence.

Students should not plan extensive travel until the dates of their duties have been determined.

Student Leaves

1. Short-term, acute illness should be reported via email to the course instructor or the research advisor.

2. In the case of lingering illness, the student must notify the research advisor and the Graduate Program Director. In the event of chronic illness, a student may wish to (a) try working remotely, (b) consider withdrawal, (c) consider taking a medical leave of absence (which is *not* paid leave), or (d) seek temporary financial support from another source.

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3. If a student is unable to return to the US because of visa issues, the student must advise the research advisor and a Graduate Program Director. Stipends may be affected depending upon the circumstances involved. Whenever visa issues arise, the student should consult with the UVA International Studies Office (ISO).

Significant Life Events

1. GTAs, MTAs and GRAs who experience a significant life event (e.g., birth, death, or trauma of a family member) should seek the advice of a Graduate Program Director. These special cases will be resolved individually in accordance with the Provost's Policy on Significant Life Events (PROV-027). See https://uvapolicy.virginia.edu/policy/PROV-027.

2. GTAs and GRAs who anticipate the birth of a child should seek the advice of a Graduate Program Director and may be able to take advantage of the Provost's Parental Accommodation for Graduate Students on Assistantship (PROV-028). See https://uvapolicy.virginia.edu/policy/PROV-028.

APPENDIX C – CS Policy on Defunding a GRA

Once a PhD student has matched with a faculty advisor, that event establishes a two-way obligation such that (1) the student agrees to make continuous and satisfactory progress toward his or her degree, and (2) the faculty member agrees to provide mentoring and GRA support throughout the student's tenure, as long as the student is making satisfactory progress. A student's performance may be deemed unsatisfactory for reasons such as:

- an individual graduate course has a grade below C

- graduate GPA is lower than the required B average

- as determined by the research advisor or Graduate Program Director:

    – student is substantially late finishing required coursework

    – student is not making progress on program milestones such as the qualifying exam, PhD proposal, or dissertation

    – student is not making adequate progress on research, is not producing papers of apparent publishable quality, or repeatedly fails to meet reasonable milestones set out by the advisor

    – student has significant difficulty working within a research group (i.e., working collegially with peers)

- student has significant difficulty with oral and/or written communications not remedied by ESL courses

- violation of the policy on GTA/GRA leave

- violation of the policies on acceptable use of CS and/or UVA computing equipment

- other specific criteria as predefined by the advisor and approved by the Graduate Program Director.

Special situations such as long-term illness or parental leave are covered by other departmental and/or Provost policies.

If a student fails to maintain continuous and satisfactory progress, and if as a result the faculty research advisor wishes to discontinue GRA funding for the student, then, in accordance with the Provost's policy on Graduate Assistantships PROV-001 (available at https://uvapolicy.virginia.edu/policy/PROV-001) and SEAS funding rules, the following procedures must be followed.

1. The PhD advisor must meet with the student to (a) identify what aspects of the student's performance are unsatisfactory, and (2) explain in writing what changes must occur and on what timeline (minimum of two months) for the student's performance to be once again considered satisfactory. If the student wishes to continue working with this PhD advisor, they must be given adequate time to improve their performance and meet the advisor's set of milestones.

2. The faculty member is obligated to report any such ongoing situation to the PhD Graduate Program Director (PGPD) each time the department conducts its graduate student review. The faculty member may report their concerns to the PGPD separately from the PhD assessment process.

3. The faculty member is obligated to signal unsatisfactory performance by submitting a grade of "U" (unsatisfactory) for one or more current-semester research courses (e.g., CS 9999). If a student's performance has been borderline and an advisor needs more time to determine whether a U is warranted, an incomplete (IN) may be assigned temporarily to give the student time to improve their performance. This may be done in conjunction with step 1 above.

4. If mentoring attempts by the PhD advisor (and optionally the PhD Graduate Program Director or others) as described in step 1 are not successful, then the following procedures are invoked:

- The PhD advisor notifies the student and the PhD Graduate Program Director of the advisor's intent to defund a GRA and the advisor's proposed date of defunding (end of the current semester is strongly encouraged).

- The advisor provides the student and PGPD with a written explanation of why GRA support is proposed to be withdrawn. This is a separate notification (and later by at least two months) from the first notification described in #1 above.

- If desired by the student, a meeting is arranged with the advisor and PGPD (and optionally others who might be helpful) to discuss the issue.

- If, after discussion, the decision is to proceed with defunding, then the student may (a) exit the program immediately (mid-semester, and funding will be withdrawn immediately), or (b) finish the current semester (e.g., to complete courses or complete a master's degree, or (c) search for a new PhD advisor.

- In cases (b) and (c) above, funding from the current research advisor continues for the *longer* of (1) two months or (2) the remainder of the current term (Fall, Spring, Summer).

It should also be noted that defunding a GRA can have serious consequences, especially for those on an F-1/J-1 visa. For more details, consult the International Studies Office (ISO).

Deviations from this policy due to exceptional circumstances will be handled on a case-by-case basis.