

COMPUTER SCIENCE, PHD

Banner Code: VS-PHD-CS

Academic Advising

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The Computer Science PhD program requires coursework, qualifying and comprehensive examinations, and a doctoral dissertation that is first proposed and eventually defended. Mason's general doctoral requirements apply to this program.

Admissions & Policies

Admissions

All applicants must have an undergraduate degree, and their prior academic work must show a strong academic background in computer science. In addition, the GRE General Test is required from every applicant. Finally, each applicant must provide a resume, brief statement of career goals and personal aspirations, as well as three letters of reference. Each application receives careful consideration from the PhD Admission Committee.

Policies

Reduction of Credit

Students with a previous MS in CS or a related field may receive a reduction of credit of at most 30 credit hours. In addition, the courses taken as part of the previous MS degree can be used to satisfy the course requirements of the PhD degree. Reduction of credit and waiver of course requirements requires the approval of the program director and the dean of the school. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

Program Requirements

The 72 hours of required doctoral-level credits typically consist of 48 credits of regular coursework and 24 credits of dissertation research.

Requirements

Degree Requirements

Total credits: 72

Doctoral Coursework

CS 600	Theory of Computation ¹	3
CS 700	Quantitative Methods and Experimental Design in Computer Science	3
Two semesters of		
CS 800	Computer Science Colloquium	
Twelve credits of advanced graduate courses ²		12
30 credits graduate level CS courses or courses from a field related to the student's doctoral research area ³		30
CS 990	Dissertation Topic Presentation	0

CS 998 & CS 999	Doctoral Dissertation Proposal and Doctoral Dissertation (minimum of 12 credits of CS 999 required)	24
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Total Credits 72

- ¹ Must be completed with a B+ or better.
- ² Must be selected in consultation with the student's advisor from a list maintained by the CS department. The 12 credit hours may include at most 3 credits of CS 896 Directed Reading and Research. Students may register in CS 896 Directed Reading and Research only after passing the PhD qualifying exams.
- ³ Must be selected in consultation with the student's advisor.

Note:

With careful selection of courses, students may earn an MS degree as part of their PhD studies. CS 600 Theory of Computation, CS 700 Quantitative Methods and Experimental Design in Computer Science and 12 credits of advanced graduate courses taken as part of the coursework for the PhD degree can be applied towards the MS degree, if the selected courses also satisfy the requirements of the MS degree.

Qualifying Exam

Students must demonstrate breadth of knowledge in computer science by passing written qualifying exams. The exams are offered once every semester (usually in the week before the semester begins). To qualify, each student must pass exams in four areas, one of which is foundations of computer science. The other three areas are chosen from these eight areas: operating systems, networks, compilers and languages, object-oriented software specification and construction, software modeling and architectural design, artificial intelligence, database systems, and information systems security. The four exams must be attempted in the same semester, and a failed exam may be retaken once only in the next semester. A student who fails to pass the four exams in two consecutive semesters is subject to termination from the program. Students entering the program who receive a reduction of credit of 15 or more credit hours for a previous Master's degree must take the exams no later than the first opportunity following the completion of 18 credits at Mason. Other students must take the exams no later than the first opportunity following the completion of 24 credits at Mason.

Dissertation Research

A minimum of 24 credits of CS 998 Doctoral Dissertation Proposal and CS 999 Doctoral Dissertation must be completed, of which at least 12 must be in CS 999 Doctoral Dissertation. Only 24 credits of CS 998 Doctoral Dissertation Proposal and CS 999 Doctoral Dissertation may be applied toward the degree. Students may enroll in CS 998 Doctoral Dissertation Proposal only after passing the qualifying exams, and they may enroll in CS 999 Doctoral Dissertation only after advancing to candidacy.

Select 24 credits from the following: 24

CS 998	Doctoral Dissertation Proposal	
CS 999	Doctoral Dissertation (minimum 12 credits required)	

Dissertation Committee Selection

Each student must form a dissertation committee, comprising four or five individuals. Three members of the committee must be tenured or tenure-track faculty in the Computer Science Department. The fourth member should be a member of the George Mason University graduate faculty who is outside the department. The fifth member may be from outside the university. The chair of the dissertation committee, who must also be the dissertation director, must be tenured or tenure-track faculty in the Volgenau School. The committee must be approved by the chair of the Computer Science Department.

Comprehensive Exam

Students must pass an oral comprehensive exam in which they demonstrate depth of knowledge in their intended area of research and ability to perform original research in that area. The scope of the oral exam is defined by a reading list prepared by the student and the dissertation director. The list should include research papers and textbooks that adequately cover the basic tools used in the research area, the fundamentals of the research area, and state-of-the-art knowledge in the specific focus of research. The reading list must be accompanied by a one-page description of the intended research. This document must be approved by the dissertation committee at least one month prior to the exam and becomes part of the student's record. The duration of the oral exam is typically two hours. Students who fail the exam are allowed to retake it once. Failure in the second attempt results in dismissal from the program.

Dissertation Proposal

Each student must prepare a written dissertation proposal. While preparing this proposal, the student enrolls in CS 998 Doctoral Dissertation Proposal. The proposal must be made available to the committee at least two weeks in advance of the presentation. The proposal must be presented to and approved by the dissertation committee. The committee determines whether the proposal has merit and can lead to significant contributions to the area and whether the student has the knowledge and skills to complete the proposed work successfully and in a timely manner. Students may present their dissertation proposal only after passing the comprehensive exam, and the presentation may not be on the same day as the comprehensive exam. If the student fails to defend the proposal, the student may present a dissertation proposal a second time at a later date. Failure in the second attempt results in dismissal from the program. On completing this requirement successfully, the student is advanced to candidacy for the PhD degree.

Dissertation Preparation and Defense

While preparing the dissertation, the candidate enrolls in CS 999 Doctoral Dissertation. When the work is deemed complete, the dissertation is defended. The public defense is preceded by a predefense meeting in which only the candidate, the dissertation committee members, and the director of the PhD in Computer Science Program (or his or her representative) are present. If the committee approves, the candidate may then schedule the final public defense. There should be at least one month between the predefense meeting and the defense, and the defense must be announced at least two weeks in advance. The dissertation must be made available to the committee at least two weeks in advance of the defense. The entire dissertation committee must be present at the defense, unless an exception is approved by the director of the PhD in Computer Science Program in advance of the defense. The dissertation must make significant contributions to its area and be publishable in refereed journals or conferences. If the candidate defends

the dissertation successfully, the dissertation committee recommends that the final form of the dissertation be completed under the supervision of the dissertation director and the graduate faculty of Mason accept the candidate for the PhD degree. If the candidate fails to defend the dissertation, the candidate may request a second defense, following the same procedures as for the initial defense. There is no time limit for this request other than general time limits for the doctoral degree and an additional predefense is not required. A candidate who fails a second attempt to defend the dissertation is dismissed from the program.