COMPUTER SCIENCE, PH.D.

The Doctor of Philosophy in Computer Science (Ph.D.) is intended for students who want to have careers that require in-depth research experience in areas related to theoretical or applied computer science. Successful candidates are prepared to solve significant research problems in the academy, industry, government (e.g. national laboratories), or non-profits.

Admission

All students in the Computer Science (CSI) doctoral program must have a Bachelor of Science or Master of Science degree in computer science or a closely related field. The submission of GRE score is required for admission. While prior research experience is valued highly, each application package will be evaluated holistically by the Graduate Committee of the Department of Computer Science.

Course Requirements

The course requirements for the doctoral degree include:

Code	Title	Hours
Required Courses		
All course requirements for a Master of Science in Computer Science degree, excluding:		27
CSI 5V92	Master's Research	
CSI 5V96	Master's Project	
CSI 5V99	Thesis	
18 additional hours of 5000 or 6000-level course work		18
24 additional hours of 6000-level course work, of which at least 12 hours must be:		24
CSI 6V99	Dissertation	
Total Hours		**69**

A total of 69 hours post-Bachelor's degree are required, including dissertation hours.

A student entering the program with graduate-level work or a master's degree in computer science or a closely related field may apply up to twenty-seven (27) semester hours of approved courses toward the Ph.D.

Qualifying Examinations

The qualifying exams will consist of two distinct portions: a Breadth Exam and a Depth Exam. It is intended to test the mastery of a number of related fields as well as the student's capacity for synthesis and critical analysis.

Timing: At the end of the third full semester (summer semesters not counted), the student should prepare to take their qualifying exams. The student must be enrolled and in good standing during the semester. To start the qualifying exam process either before or after the fourth semester due to transfer credits, requiring of leveling courses, etc., the student must obtain approval from their advisor and the Graduate Program Director (GPD) by the 2nd Friday of their fourth full semester.

Breadth Exam

A student must demonstrate breadth of knowledge in computer science in one of two ways: (1) Superior Course Performance (defined below) or (2) Area Examinations. As long as a student is able to complete one of these paths, they are eligible to proceed with the Depth Exam. If a student is not able to complete one of these paths, there is no alternative to move forward in the process.

Superior Course Performance: The first option for demonstrating breadth of knowledge is by obtaining superior grades in four graduate courses, two of which must include Analysis of Algorithms and Theory of Computing. The other two courses can be selected from any of the following areas (only one course may be selected per area): Systems and Networks, Security, Machine Learning and Artificial Intelligence, Software Engineering, Databases, and Visual Computing. The grades obtained in the four selected courses must meet the following requirements: 1) Students must obtain a grade of A- or better in at least three of the four courses, and 2) In the fourth course, students must obtain a grade of B or better.

Area Examinations: Alternatively, the prospective candidate can opt to take four written area examinations, one of which must be a combined Algorithms and Theory of Computation exam. To begin the process, the student must inform the GPD of their preferred areas of examination. It is the responsibility of the GPD to select the faculty who will be administering each exam and determining pass/fail for that particular area's examination. All examinations will be administered during a single morning where the student is given four hours to complete all of the required material. The faculty who prepare the examinations will have one week to grade and inform the student and department of the results of the exam (Pass/Fail).

Depth Exam

The Depth Exam will be broken into two subsequent parts: a Written Examination followed by an Oral Examination. A student must pass both to be considered "Passed" for the qualifying examination. In preparing for this portion of the exam, the student will first select a committee of three members. Two of the members must be in the student's research area and the third must be outside the research area. To begin the process, the student, the advisor, and the rest of the committee must complete and submit the Qualifying Exam Application Form, found on the Degree Requirements page on the Baylor ECS website, to the GPD at least two weeks before the exam. Once the application has been approved by the GPD and the department chair, the written portion of the depth exam can begin.

Written Examination: The committee members and any other graduate faculty will select 5-7 papers related to the student's research interests and outline 2-3 basic research questions which need to be explored in the written document. The student will be given two weeks to create a written report on the assigned readings which must involve an in-depth study and critical analysis. While the report should summarize the articles, it is expected that the report will demonstrate the student's ability for critical analysis and synthesis of fundamental knowledge. The student's written submission will be evaluated by the committee and each member will determine whether the student has passed or failed the written portion of the exam. If two or more members give a grade of "fail", then the student does not pass the written exam. The results of the exam will be returned to the students within two weeks of final submission.

Oral Examination: The oral exam will be offered twice a year, once during the fall semester and once during the spring semester. Students become eligible to register for the oral exam once they have received a passing grade for the written portion of the depth exam and have successfully completed one of the two paths to the breadth exam. The oral exam must take place in the presence of the committee but is open to any graduate faculty who wish to attend. During the exam itself, committee members

or any attendees may ask questions from a wide range of topics (not constrained to the specific contents of the student's written report). However, the questions should have some relevance to the topic.

In preparing for the oral part of the exam, the student should be prepared to give oral explanations and/or presentations of various aspects, and possible extensions, of the written part of the exam. However, the degree to which aspects of the written part of the examination are re-iterated and/or expanded upon during the oral part of the examination is per the discretion of the committee and can cover any aspect of a computer science education that the committee deems appropriate to the examination. The oral portion of the exam should be no less than one hour and no more than four hours in duration. As with the written exam, if two or more members give a grade of "Fail", then the student does not pass. Once complete, the committee will convene and determine the results of the oral portion within 24 hours of the end of the exam. If the committee, in either the written or the oral examinations, gives a grade of "Fail," the student will be required to start the process over with a new depth examination. Students are allowed only one failure. If a second failure is given, the student will no longer be eligible to continue as a Ph.D. student in the Computer Science program.

Appeals Process

If the student is unable to pass either of the options for the breadth exam or if they have failed the written and oral examination twice, then they may appeal the decision to the chair of the department within 6 months of receiving the final decision. If the student believes that the issue has still not been resolved, they may have a final appeal to the Dean of the Graduate School.

Student's Dissertation Committee

The Dissertation Committee for a Ph.D. candidate shall follow the guidelines given in the Dissertation Examining Committee Composition section of the Baylor Graduate Catalog.

Dissertation Proposal

A student must pass a dissertation proposal and preliminary exams before being admitted to candidacy and allowed to enroll in CSI 6V99 Dissertation. The student is expected to write a proposal formatted as a federal funding application (e.g. to NSF or NIH) and make a presentation to the committee about the proposed research. The student will not be allowed to register for CSI 6V99 Dissertation until the Graduate School has approved the Result of the Preliminary Examination form and Admission to Doctoral Candidacy form.

Dissertation

Candidates for the Ph.D. in computer science degree must complete an acceptable dissertation on a research topic in the computer science discipline or a closely related field. The dissertation must show evidence that the candidate has made a significant scholarly contribution to the field. At the completion of the dissertation research, the candidate defends the dissertation before the dissertation committee.

Foreign Language Requirement

The CSI doctoral program does not have a foreign language requirement.