

## Doctor of Philosophy in Computer Science

The Doctor of Philosophy in Computer Science (Ph.D.) is offered through a cooperative program involving the Computer Science departments at the University of New Mexico, New Mexico State University (Las Cruces, NM) and the New Mexico Institute of Mining and Technology (Socorro, NM). Doctoral students at the University of New Mexico may specialize in areas of current interest to the University of New Mexico faculty, or, by special arrangement, they may work in areas of interest to faculty at either of the other two universities.

For the most up to date information and graduation requirement of the Ph.D. degree, please refer to the University Catalog: <http://registrar.unm.edu/UNM%20Catalog/index.html>.

### General Graduation Requirements

- A minimum of 48 credit hours of graduate credit coursework and an additional minimum of 18 credit hours of dissertation credit hours (699) are required for the doctorate.
- 4 credit hours of CS 592 Colloquium, taken from the University of New Mexico. If the student enters the program with a master's degree, the requirement is reduced to 2 credit hours of CS 592.
- At least 24 of the credit hours, exclusive of dissertation, must be completed at one of the three New Mexico universities.
- At least 30 credit hours, exclusive of dissertation, must be in courses numbered 500 or above. Of these credit hours, at most 12 may come from individual study courses (at the University of New Mexico, CS 551 and CS 650). If the student enters the program with a master's degree, the requirement is reduced to 18 credit hours in courses numbered 500 and above—at most 9 of these credit hours may come from individual study courses.
- Passing marks on the comprehensive course work, on the oral candidacy examination and on a final oral examination in the student's area of specialization.
- Every student who has passed the comprehensive course work requirement must give one Colloquium before graduation, surveying the student's work to date.
- Teaching requirement for the doctorate: As a requirement for the Ph.D. in Computer Science, all students complete a one-semester teaching assignment. Typically and preferably, this assignment involves running a class section, including classroom lecturing; there is, however, some flexibility in tailoring this assignment to each particular student. The student is encouraged to fulfill this requirement early in his or her studies, as the teaching experience is expected to help solidify the student's mastery of core Computer Science material.

### Research Milestone Requirement

All Ph.D. students must also complete a Research Milestone. The milestone is a validation by a small committee of CS faculty on behalf of the department that the student has demonstrated the ability to conduct independent research at a level appropriate for developing and completing a dissertation in the department.

Within 2.5 calendar years of matriculation, each Ph.D. student is required to write and successfully defend a paper or report documenting significant technical research by the student. The paper should describe the student's body of work and be written in a style that is appropriate for submission to a peer-reviewed computer science conference.

Ordinarily, Ph.D. students select a subject area advisor for the milestone project at the beginning of their second year in the program, and register for CS 600 Computer Science Research Practicum. The Practicum provides intensive supervision for one semester, in collaboration with the subject area advisor, as the student develops a milestone project and begins to research it. All students are required to have submitted the milestone paper and to have presented it to a committee of three CS faculty by the fourth week of the Fall semester of their 3rd year (5th semester in the program, or 6th semester for January admits). The Committee consists of the Practicum instructor, the subject area advisor, and an additional member appointed by the Graduate Committee. If the Committee determines that either the paper or the presentation is not satisfactory, the student has the remainder of the semester to work with the Committee to produce a satisfactory outcome. If the student fails to pass the milestone by January (beginning of the 6th semester in the program), then the student is asked to leave the program. Students who successfully complete the milestone before their third semester in the program (both the paper and presentation) can be exempted from the Practicum at the discretion of their advisor.

In addition to this process, all students will continue to receive annual evaluations from the department.

Students must complete the comprehensive course work and research milestone as noted above. Upon completion of the course work the student is allowed to work toward the dissertation. The student's advisor and the graduate advisor or department chairperson then appoint a dissertation committee which determines the student's remaining program of study and conduct the candidacy examination. The candidacy examination verifies that the student possesses the specialized knowledge required for his/her area of research and ensures that the proposed dissertation topic is adequate in scope, originality and significance. The student is admitted to candidacy for the doctorate upon completion of the comprehensive course work and candidacy examination, with the approval of the doctoral committee and the Dean of Graduate Studies. Finally, the committee evaluates the student's doctoral dissertation and conducts the final oral examination on the student's area of specialization.

#### **Ph.D. Comprehensive Course Work**

All students pursuing a Ph.D. degree are required to complete at least 18 credit hours of comprehensive course work to provide knowledge in core areas of computer science. Students must also take at least two additional CS graduate-level courses in their area of research specialization.

Students must choose two courses from each category below. Students must achieve a minimum cumulative GPA of 3.5 for the comprehensive courses.

Systems	Credits	Grade	Semester
CS 554 Compiler Construction	3		
CS 585 Computer Networks	3		
CS 587 Advanced Computer Operating Systems	3		

Theory	Credits	Grade	Semester
CS 500 Intro to the Theory of Computation	3		
CS 550 Programming Languages and Systems	3		
CS 561 Algorithms and Data Structures	3		

Empirical Methods	Credits	Grade	Semester
CS 530 Geometric & Probabilistic Methods in CS	3		
CS 533 Experimental Methods in CS	3		

Students are also required to complete a language requirement by taking at least one of the following:

Language Requirement	Credits	Grade	Semester
CS 550 Programming Languages and Systems	3		
CS 554 Compiler Construction	3		
CS 558 Software Foundations	3		