COMPUTER SCIENCE, PH.D.

The Ph.D. in Computer Science takes approximately four years to complete. Research specialties include algorithms, artificial intelligence, data science and machine learning, database systems, extended reality, image processing, networking, and security.

For information regarding deadlines and requirements for admission, please see https://grs.uncg.edu/programs/.

Students must have a previous degree in computer science (B.S. or M.S. degree), or a closely-related field such as computer engineering or software engineering. Students looking to enter computer science without a prior degree are encouraged to apply to the M.S. program.

Applications are competitive, and applicants are expected to have a strong quantitative/mathematical background and a good overall GPA (at least 3.0).

In addition to the materials required by The Graduate School, applicants must submit:

- Official transcripts for all postsecondary education, showing completion of a prior degree (B.S. or M.S.) in computer science or a closely-related field
- TOEFL/IELTS for non-native English speakers
- An essay ("statement of purpose") describing their goals in pursuing a Ph.D. in Computer Science, including a description of specific interests or a faculty member that the applicant is interested in working with (1-2 pages)
- A curriculum vita describing prior research or work experience (if any)
- Three letters of recommendation

Degree Program Requirements

**Required: 54 credit hours (or 72 credit hours without a previously-earned M.S. degree)**

Qualified students with an M.S. in Computer Science must complete 54 credits of course work in the Ph.D. program. At least 33 credits of the total must be at the 700-level. (Students with a B.S. in Computer Science or a related discipline must complete 72 credits; see section below for information.)

**Total Credit Hours** 54-72

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>CSC 701</td>
<td>Doctoral Student Orientation</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Core Courses (18 credits)</strong></td>
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<tr>
<td></td>
<td>Select two courses (6 credits) from the following Theory and Algorithms courses:</td>
<td>6</td>
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<tr>
<td>CSC 752</td>
<td>Theory of Computation</td>
<td></td>
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<tr>
<td>CSC 754</td>
<td>Algorithm Analysis and Design</td>
<td></td>
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<tr>
<td>CSC 756</td>
<td>Foundations of Computer Science</td>
<td></td>
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<td>Select two courses (6 credits) from the following Systems and Networks courses:</td>
<td>6</td>
</tr>
<tr>
<td>CSC 761</td>
<td>Principles of Computer Architecture</td>
<td></td>
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<tr>
<td>CSC 762</td>
<td>Principles of Operating Systems</td>
<td></td>
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<tr>
<td>CSC 777</td>
<td>Principles of Computer Networks</td>
<td></td>
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<tr>
<td>CSC 779</td>
<td>Dissertation</td>
<td>15</td>
</tr>
</tbody>
</table>

Select two courses (6 credits) from the following Data/Knowledge courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>CSC 705</td>
<td>Data Science</td>
</tr>
<tr>
<td>CSC 709</td>
<td>Big Data and Machine Learning</td>
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<tr>
<td>CSC 716</td>
<td>Digital Image Processing</td>
</tr>
<tr>
<td>CSC 725</td>
<td>Bioinformatics</td>
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<tr>
<td>CSC 729</td>
<td>Artificial Intelligence</td>
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<tr>
<td>CSC 744</td>
<td>Human-Computer Interface Development</td>
</tr>
<tr>
<td>CSC 771</td>
<td>Advanced Database Systems</td>
</tr>
</tbody>
</table>

Electives (18-36 credits)

Select 18-36 credits from other 600- or 700-level CSC courses ** 18-36

Dissertation (15 credits)

CSC 799 | Dissertation

* Must take at least two courses from each area. Prior graduate-level course work may be used to complete the core courses requirement, but students must pass their qualifying exam in each area at UNC Greensboro.

** Other than CSC 799. At least 15 credits of electives must be at the 700-level. Students may select courses from other departments with approval of the Graduate Program Director.

Advisory Committee

Each student will have an advisory/dissertation committee, consisting of at least four members of the graduate faculty, who shall assist the student with the preparation of the plan of study and shall guide and evaluate the doctoral dissertation. This committee will be appointed by the Dean of Graduate Education upon the recommendation of the Computer Science Graduate Program Director and must be mutually acceptable to the student and all committee members. The committee chair must be a graduate faculty member in the Department of Computer Science and at most, one committee member may come from outside the Department of Computer Science. If appropriate to the student's dissertation research, one member may be from outside the department or outside the university (any member from outside UNC Greensboro must be approved by the university as adjunct graduate faculty). The student must request the appointment of this committee no later than upon completion of the first 18 credits of graduate course work. Any subsequent changes in the advisory/dissertation committee must be approved by the Graduate Program Director and submitted to the Graduate School for approval.

Seminar Attendance and Participation

Ph.D. students are expected to become part of an active scholarly community with other students and faculty in the department. As such, all students are expected to attend all departmental research talks and present at least one public research talk in addition to their dissertation proposal and defense. Students must track attendance at talks using a department-determined process, such as an attendance log.

Qualifying Exam

- Part 1: Based on core courses taken by the student
- Part 2: Ph.D. dissertation proposal

Part 1 of qualifying exam is a written exam based on the core courses the student has taken. It is offered twice per year: a regular exam offering in May (after Spring classes conclude) and a "make-up exam" offering in...
the early part of the Fall semester. This part of the qualifying exam will
consist of three individual area exams, corresponding to the three core
areas in the table above, and each area exam will be designed to be three
hours long. Area exams will be scheduled over a period of two weeks.
Content will be determined by faculty responsible for the core courses
taken by the student. If a student fails an area exam for any of the core
areas in the regular exam offering, a second and final chance will be given
to retake the failed area exam(s) at the make-up date.

Part 2 is intended to evaluate students research aptitude. In consultation
with the student’s advisor, the student thoroughly surveys a research
area and prepares a written proposal for his/her dissertation that puts
the proposed research in the context of previous work. Then an oral
exam is held during which the student presents the proposal to the
advisory committee, who evaluates and assigns a grade (pass/fail). A
failing student is given a second and final chance. Students must have
demonstrated participation in the department’s scholarly community by
documenting attendance at 9 or more department research talks before
being eligible for presenting their dissertation proposal.

**Dissertation Defense**

With the approval of the advisor, the student submits the dissertation
to Graduate School. The dissertation defense is then conducted by the
advisory committee.

**Students with a B.S. in Computer Science or Related Discipline**

Students with a B.S. in Computer Science or a related discipline can
apply for admission to the Ph.D. in Computer Science. The minimum
credit hour requirement for the Ph.D. for these students is 72 credits. The
admissions committee can require students with inadequate preparation,
who are otherwise qualified, to take additional courses (in addition to the
minimum 72 credits). Normally, these students will spend at least one
year (2 semesters) in preparation for the Ph.D. program. These students
may register for CSC 701 at the beginning of their second year. Students
who complete the M.S. program may receive a “pass through master’s”
after passing phase 1 of their qualifying exam.