Doctor of Philosophy in Computer Science

About This Program

The purpose of the Doctor of Philosophy (PhD) in Computer Science is to facilitate the student's continued professional and scholarly development. The program is designed to prepare the student to conduct research and development in an area of concentration.

A doctorate in computer science builds on prior knowledge, education, and experience in the field. The degree typically takes 4-5 years to complete, and involves independent study and research in a focused area of interest. Doctoral programs include coursework and research that culminate in a final dissertation.

Students may apply for the PhD program after completing their MS degree in computer science or proceed directly to PhD program after completing their BS degree in computer science. Students without an MS will typically spend an extra year learning the basic research skills prior to begin working on their dissertation.

DEGREE OPTIONS

PhD candidates select one of the following 9 graduate tracks provided by the Computer Science and Engineering Department and complete five milestones to achieve their doctorate in Computer Science:

1. Big Data Management/Databases/Cloud Computing (database systems, data mining, cloud computing, big data, and others)
2. Intelligent Systems/Robotics (knowledge representation, knowledge acquisition, machine learning, neural networks, parallel AI and others)
3. Networks/IoT/Communications (telecommunications and mobile computing)
4. Software Engineering (environments, formal verification, testing, and others)
5. Systems/Architecture/Languages (authoring, compression, collaboration and communication)
6. Data Analytics/Algorithms/Theory (numerical methods, compilers)
7. Imaging/Health Informatics/Bioinformatics (multimedia systems, digital image processing)
8. Security/Privacy (information security, secure programming)
9. Embedded Systems (Real-time operating systems, microprocessor systems, RISC processor design)

Competencies

1. Upon completion, students will demonstrate mastery of advanced computer science topics, including both breadth across key areas and depth in a specialization or research area.
2. Upon completion, students will evaluate and synthesize scholarly literature and existing solutions to inform new approaches.
3. Upon completion, students will apply critical thinking and quantitative analysis to evaluate system performance, security, scalability, and usability.
4. Upon completion, students will apply advanced computing theory and knowledge to design and develop computing-based solutions.
5. Upon completion, students will analyze and solve computing problems using appropriate models, algorithms, tools, and technologies.

Admissions Criteria

The CSE graduate admission committee bases its decision for PhD graduate admission on the following criteria (in no specific order):

- An undergraduate degree in CS or CpE or a closely related field
  - Applications from other fields, particularly mathematics, science, and engineering are also considered. These applicants may need to take some deficiency courses.
- An overall GPA of 3.0 or higher in undergraduate coursework
- A 3.2 grade point average (on a 4.0 scale) on the last two years of undergraduate coursework. In particular, performance in CS/CpE related courses is emphasized.
- Rigor of the student's bachelor's degree. A three-year degree is not considered rigorous enough
- Reputation of the university/college that the student has received their previous degrees from
- GRE General Test: not required.
- For PhD applicants, three letters of recommendation are needed and are requested within the application system. Also needed directly from the applicant are a statement of purpose and a CV which the applicant must email to CSEGradAdvising@uta.edu
- For PhD applicants, the following are optional. Meeting these criteria will improve both a student's chances of securing admission and receiving financial support:
  - Publication in scholarly conferences/journals
- An international student whose native language is not English is required to take TOEFL (min 90, Speaking 23) or IELTS (7.5, Speaking 7.0).

Curriculum

Foundations (Core)		
CSE 5311	DESIGN AND ANALYSIS OF ALGORITHMS	3
Select three from the following:		9
CSE 5301	DATA ANALYSIS & MODELING TECHNIQUES	
CSE 5306	DISTRIBUTED SYSTEMS	
CSE 5317	DESIGN AND CONSTRUCTION OF COMPILERS	
CSE 5350	COMPUTER ARCHITECTURE II	
or CSE 5351	PARALLEL PROCESSING	
Electives		
Select 9 hours of advanced graduate coursework in consultation with advisor.		9
Research Hours		
Select at least 9 hours from the following:		9
CSE 6397	RESEARCH IN COMPUTER SCIENCE	
CSE 6697	RESEARCH IN COMPUTER SCIENCE	
CSE 6997	RESEARCH IN COMPUTER SCIENCE	
Dissertation		
Select at least 18 hours from the following:		18
CSE 6399	DISSERTATION	
CSE 6699	DISSERTATION	
CSE 6999	DISSERTATION	
CSE 7399	DOCTORAL DEGREE COMPLETION (to be taken only in the semester in which the student will defend)	
Total Hours		**48**

For students holding a master's degree and with approval of a CSE advisor, CSE 5311 may be waived if the candidate already successfully completed a graduate level algorithms course, and research hours may be waived in agreement with the student's supervising professor.

Program Completion

To fulfill its responsibility to graduate highly qualified students, the Department has established certain requirements that must be met by students continuing in the graduate programs. In addition to the requirements of the Graduate School listed elsewhere in the catalog, the Computer Science and Engineering Department has established additional requirements detailed in its Guide to Graduate Programs.

MILESTONES

After completing one of the major tracks, a PhD candidate must complete the following five milestones:

1. Committee Formation: At least 4 members (supervisor plus three committee members). One member may be external. External member must be approved by the department's Graduate Studies Committee.
2. Diagnostic Evaluation: All students must complete required core classes plus classes in their selected major.
3. Comprehensive Exam: A written and an oral examination that evaluates the basic research foundation of the candidate prior to the proposal and dissertation phases.
4. Research Proposal: Propose dissertation topic. Requires full approval of the committee members.
5. Defense: Final defense and granting PhD.

All PhD students' progress toward the milestones are reviewed and monitored by the student's committee.

Advising Resources

Graduate students should consult a graduate advisor as needed

Location:

Engineering Research Building 6th Floor

Email:

csegradadvising@uta.edu

Phone:

N/A

Web:

Graduate Advising (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/cse/students/graduate-advising/)