Doctoral Program Guide

Computer Science and

Engineering Department

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Purpose of This Guide

This guide will answer some of the common questions asked about the PhD programs offered by the University of Texas at Arlington Computer Science and Engineering Department. It supplements the Graduate Catalog with specific information about the program. Nothing in this guide is intended to conflict with the information in the UTA Catalog.

All students are expected to be familiar with the information presented in this guide before seeking advice from the Graduate Advisor.

For the rest of this guide, The University of Texas at Arlington will be referred to as UTA and Computer Science and Engineering will be referred to as CSE.

Graduate Advisor

A CSE Graduate Advisor will serve as the point of contact to answer questions and help resolve academic issues regarding the CSE graduate program degree requirements, policies, and procedures.

Student Responsibility

http://catalog.uta.edu/academicregulations/studentresponsibility/

The student is responsible for seeking academic advice, for enrolling in appropriate courses to ensure progress toward a degree, for timely completion of his or her academic program, for familiarity with the appropriate catalog, and for maintaining University standards. Assistance from an academic advisor is not a substitute for the personal responsibility of the student.

Communications Sent to Students

All UTA students must check their UTA email account frequently as CSE department communications to students will be sent to that address.

CSE Doctoral Programs

Typically Accepted Students

CSE gives priority admission consideration to applicants who:

1. Have a master's degree in computer science or a related field, *preferably with a thesis*, as evidence of research aptitude, unless the applicant is seeking admission to the BS to PhD program and has earned only a bachelor's degree,
2. Have a 3.2 GPA (on a 4.0 scale) in all previous coursework, especially in advanced coursework.
3. Supply GRE scores of 310 or better with a quantitative score of no less than 160. The GRE is strongly recommended but not required.
4. Are able to obtain three strong recommendation letters, preferably from university faculty in technical areas. One letter from a manager or supervisor is acceptable but academic references are preferred.
5. Submit a solid statement of goals, called the Statement of Purpose (SOP), indicating an area of doctoral-level research that can be supported by the UTA CSE department. The statement must have specific research area(s) that the applicant seeks to pursue and cannot be a general statement of interest encompassing all areas of CSE. The SOP will be used by the PhD Admission Committee to ascertain whether available faculty expertise and interest can properly support the applicant's dissertation research.
6. If applicable, an international student whose native language is not English is required to take the TOEFL, IELTS, or Duolingo test. For the TOEFL, if the applicant scores less than 92 (IBT max = 120), the applicant may be required to take additional English courses after admittance to UTA. For the IELTS, if the student scores less

than 7.5 the applicant may be required to take additional English course after admittance to UTA. The CSE department strongly recommends the TOEFL or IELTS over the Duolingo exam as Duolingo scores are not accepted for departmental assignment and funding as a graduate teaching assistant.

7. Submit their CV/resume

Entrance Procedures

When the needed application materials have been collected, the file is noted as ready for review. Upon review by the CSE PhD Admissions Committee, a decision is submitted to Graduate Admissions and then the applicant is sent a final decision by Graduate Admissions.

Students currently in the master's program at UTA who wish to continue on into PhD studies should file a Change of Program Request and submit the additional documents needed for PhD admission. UTA students seeking continuation into the PhD program will be reviewed in the same manner as applicants who would be new to UTA.

Degree Requirements

This section contains the specific requirements for earning the Doctor of Philosophy degree in Computer Science or Computer Engineering from CSE at UTA. It is the intent of CSE to incorporate all UTA Graduate School requirements into this document. However, students are still responsible for meeting all current UTA Graduate School requirements as stated in the general UTA catalog.

Introduction

Students in the PhD program in Computer Science (CS) or Computer Engineering (CpE) are expected to achieve and demonstrate a mastery of the discipline, and significantly advance the state of knowledge through an original research effort. Coursework for a masters CSE degree tends to be the primary focus while the thesis is secondary. The emphasis is reversed in PhD studies.

Regarding the completion of a PhD degree, graduation requirements fall into three categories: successful completion of a specified number of graduate courses in appropriate subjects with an acceptable grade point average, demonstration of understanding of the discipline of computer science or computer engineering as evidenced by examination, and completion of a substantial research effort documented in a doctoral dissertation.

The PhD Timeline that appears later in this document shows when various milestones are expected to be met. The milestones that a student must pass during the course of a doctoral program are basic and advanced course work, the diagnostic evaluation, the comprehensive examination, the research proposal, dissertation research and documentation, and the dissertation defense. PhD students must also continuously maintain a minimum 3.0 cumulative GPA. There is no foreign language requirement for a PhD degree in CSE.

Transfer work

There is no transfer credit option for PhD students. If a student previously took graduate courses equivalent to the required courses for the UTA CSE degree, the UTA courses can be waived off the student's degree requirements, however, the number of hours required for the degree is not reduced. The student must still meet the minimum hours required for the earning of the degree by taking courses other than those listed as required. Such courses should be taken under the direction of the student's supervising professor.

Credit Requirements for MS to PhD Candidates

MS to PhD students must complete a minimum of 18 semester hours of coursework as noted below. Research oriented coursework (numbered 6397, 6697, and 6697), if taken, does not count toward these 18 hours.

An MS to PhD Computer Science student must enroll for a minimum of 18 semester hours of coursework as follows:

-Completion of 4 core courses with a minimum GPA of 3.0 chosen from the following:

- CSE 5311 - Design and Analysis of Algorithms
  and three of the following:
  - CSE 5301 - Data Analysis and Modeling Techniques
  - CSE 5306 - Distributed Systems
  - CSE 5317 - Design and Construction of Compilers
  - CSE 5350 - Computer Systems Architecture or CSE 5351 - Parallel Processing
  - or proof that the student completed a course at a different institution at a master's level or above

-Completion of at least three 6000 level courses (9 hours) as a PhD student at UTA.

-All students must also enroll for a minimum of 18 semester hours of dissertation courses (CSE 6399, 6699, 6999, or 7399) with 6699, 6999, or 7399 required in the semester in which the dissertation is defended.

An MS to PhD Computer Engineering student must enroll for a minimum of 18 semester hours of coursework as follows:

-Completion of 4 core courses with a minimum GPA of 3.0 chosen from the following:

- CSE 5301 - Data Analysis and Modeling Techniques
- CSE 5306 - Distributed Systems
- CSE 5311 - Design and Analysis of Algorithms
- CSE 5317 - Design and Construction of Compilers
- CSE 5342 - Embedded Systems II
- CSE 5350 - Computer Systems Architecture or CSE 5351 - Parallel Processing –
- CSE 5354 - Real-time Operating Systems (or CSE 6351 when co-listed)
- or proof that the student completed a course at a different institution at a master's level or above

-Completion of at least three 6000 level courses (9 hours) as a PhD student at UTA.

-All students must also enroll for a minimum of 18 semester hours of dissertation (CSE 6399, 6699, 6999, or 7399) with 6699, 6999, or 7399 required in the semester in which the dissertation is defended.

Milestone	Expected Semester
Form Committee - 4 members minimum	1st or 2nd long semester
Diagnostic Evaluation	2nd or 3rd long semester
Comprehensive Exam	2 long semesters after Diagnostic Evaluation[1,2]
Proposal	1 long semester after Comprehensive Exam
Defense	See 99 hour/ 14 semester regulations[3]

1- To pass the diagnostic evaluation, the student must achieve a GPA of 3.0 or higher in the core courses. If a student schedules the diagnostic evaluation while completing core coursework a conditional pass will be given until the completion of the courses and achievement of a 3.0 or better GPA

2- The PhD committee may increase the number of the required courses subject to the candidate's background during the diagnostic evaluation

3-99 hour/14 Long Semester rule: The new policy stated that all PhD students cannot exceed 99 semester hours and 14 Long semesters. This is to ensure sufficient progress. Failure to meet this will be resulted in loss of funding, tuition support privileges or termination.

Credit Requirements for BS to PhD Candidates

BS to PhD students must complete a minimum of 30 hours of coursework at UTA. Research oriented coursework (numbered 6397, 6697, or 6697) counts toward these 30 hours.

A BS to PhD student must enroll for a minimum of 30 semester hours of coursework as follows:

For a BS to PhD in Computer Science:

-Completion of 4 core courses with a minimum GPA of 3.0 chosen from the following:

- CSE 5311 - Design and Analysis of Algorithms
    and three of the following:
- CSE 5301 - Data Analysis and Modeling Techniques
- CSE 5306 - Distributed Systems
- CSE 5317 - Design and Construction of Compilers
- CSE 5350 - Computer Systems Architecture or CSE 5351 - Parallel Processing
- or proof that the student completed a course at a different institution at a master's level or above

-Completion of at least three 6000 level courses (9 hours) as a PhD student at UTA

-Completion of at least nine hours of research courses (CSE 6x97)

-Completion of a minimum of 18 semester hours of dissertation courses (CSE 6399, 6699, 6999, or 7399) with 6699, 6999, or 7399 required in the semester in which the dissertation is defended.

Milestone	Expected Semester
Form Committee - 4 members minimum	3rd or 4th long semester
Diagnostic Evaluation	4th or 5th long semester
Comprehensive Exam	2 long semesters after Diagnostic Evaluation[1,2]
Proposal	1 long semester after Comprehensive Exam
Defense	See 99 hour/ 14 semester regulations[3]

1- To pass the diagnostic evaluation, the student must achieve a GPA of 3.0 or higher in the core courses. If a student schedules the diagnostic evaluation while completing core coursework, a conditional pass will be given until the completion of the courses and achievement of a 3.0 or better GPA

2- The PhD committee may increase the number of the required courses subject to the candidate's background during the diagnostic evaluation

3- The 99 hour/14 Long Semester rule: The new policy stated that all PhD students cannot exceed 99 semester hours and 14 Long semesters. This is to ensure sufficient progress. Failure to meet this will result in loss of funding, tuition support privileges or termination.

For a BS to PhD in Computer Engineering:

-Completion of 4 core courses with a minimum GPA of 3.0 chosen from the following:

- CSE 5311 - Design and Analysis of Algorithms
- CSE 5301 - Data Analysis and Modeling Techniques
- CSE 5306 - Distributed Systems
- CSE 5317 - Design and Construction of Compilers
- CSE 5342 - Embedded Systems II
- CSE 5350 - Computer Systems Architecture or CSE 5351 - Parallel Processing
- CSE 5354 - Real-time Operating Systems (or CSE 6351 when co-listed)
- or proof that the student completed a course at a different institution at a master's level or above

-Completion of at least three 6000 level courses (9 hours)

-Completion of at least nine hours of research courses (CSE 6x97)

-Completion of a minimum of 18 semester hours of dissertation research (CSE 6399, 6699, 6999, or 7399) with 6999 or 7399 required in the semester in which the dissertation is defended.

Milestone	Expected Semester
Form Committee - 4 members minimum	3rd for 4th long semester
Diagnostic Evaluation	4th or 5th long semester
Comprehensive Exam	2 long semesters after Diagnostic Evaluation[1,2]
Proposal	1 long semester after Comprehensive Exam
Defense	See 99 hour/ 14 semester regulations[3]

1- To pass the diagnostic evaluation, the student must achieve a GPA of 3.0 or higher in the core courses. If a student schedules the diagnostic evaluation while completing core coursework, a conditional pass will be given until the completion of the courses and achievement of a 3.0 or better GPA

2- The PhD committee may increase the number of the required courses subject to the candidate's background during the diagnostic evaluation

3-99 hour/14 Long Semester rule: The new policy stated that all PhD students cannot exceed 99 semester hours and 14 Long semesters. This is to ensure sufficient progress. Failure to meet this will be resulted in loss of funding, tuition support privileges or termination.

Grades

Courses in which a student earns a grade of D or F cannot be used to satisfy degree requirements. All grades do, however, count toward the student's overall GPA. Courses in which a student earns a grade of C can be used toward degree requirements, however, minimum GPA requirements must still be met. PhD students cannot repeat a course in which they earned a grade of C or better.

The PhD program requires a student to maintain a cumulative GPA of 3.0 or higher in their core courses and for the passing of the Diagnostic Evaluation. But also, if at any point a student's cumulative GPA drops below 3.0, the student will be placed on academic probation. The student then has one semester to raise the GPA to 3.0 or better. If the student does not do so, they risk being dismissed from the program and the university.

Residence

The objective of the PhD program is to develop PhD candidates who can do independent research upon graduation. This objective is not compatible with part-time study. Therefore, at least two consecutive semesters of full-time residence are required during the dissertation phase. Full time study may be pursued in conjunction with some teaching duties or departmentally supported research but is not compatible with off-campus employment.

The Graduate Studies Committee may require additional residence requirements or set specific progress goals to be attained during residency.

Annual PhD Review

All PhD students are reviewed annually by CSE faculty to ensure they are making appropriate progress toward completion of their degree. This review is generally done during the spring term.

Supervising Professor and Committee

The student must find a qualified faculty member willing to be their supervisor to guide their research and progress. With the help of the supervisor, the student must also establish a Supervising Committee.

The Supervising Committee consists of the Supervising Professor (serving as the chair of the committee), and at least three other members. The Supervising Professor must be a member of the CSE graduate faculty. Of the remaining members, three must be members or associate members of the graduate faculty. A majority of the committee must be from the CSE faculty.

The supervisor selection and the committee selection must be entered in the CSE Milestones application and verified by the supervisor and committee members.

The Supervisory Committee is responsible for administering the diagnostic evaluation, the comprehensive exam, overseeing the student's dissertation research, conducting the dissertation defense, and approving the final dissertation sent to the library.

The CSE Online App

Information regarding the student's chosen supervisor and committee must be entered in the CSE Online App. The supervisor and each committee member must also indicate their willingness to be on the committee by noting approval in the online CSE Milestones Application. Milestone scheduling must also be entered by the student as well as the final result for each milestone by the student's supervisor in the app.

PhD Timeline

A PhD student is required to select a Supervising Professor by the end of their second long semester in the PhD program. The selection of the supervisor must be entered in the CSE Milestones app and approved in the by the chosen supervising professor.

- The student must form their committee at least one month prior to the Diagnostic Evaluation. The formation of the committee must be entered in the online CSE app and each member must validate their willingness to serve on the committee.

- The Diagnostic Evaluation itself must be completed no later than three long semesters after the student starts the PhD program. The signed Diagnostic Evaluation Form must be submitted to the Graduate Advisor upon completion of the evaluation by the committee.

- The Comprehensive Exam must be scheduled no later than one year for full-time students and two years for part-time students after the Diagnostic Evaluation. The signed Comprehensive Exam Report must be submitted to the Graduate Advisor upon completion of the exam.

- The student must present his/her research proposal to the PhD Committee no later than two years after the Comprehensive Exam. The Research Proposal Form with the required presentation schedule information must be submitted to the Graduate Advisor prior to the proposal presentation.

- The student is expected to submit a copy of the PhD dissertation document along with the slides to the PhD committee at least one month prior to the actual defense. Also, copies of papers and associated reviews must be submitted to the committee at that time.

- The Final Dissertation Defense must be scheduled no earlier than 6 months after the Research Proposal. The signed Dissertation Defense Form must be submitted to the Graduate Advisor upon completion of the defense evaluation by the committee and the final dissertation must be submitted to the UTA library for cataloging and archiving.

PhD Degree Milestones

As noted in the table previously shown, PhD students are responsible for completing a series of PhD Milestones. These are described below.

Diagnostic Evaluation

All PhD students who already have a master's degree must complete the 4 required core courses as well as three 6000 level breadth courses before attempting the Diagnostic Evaluation. Students in the BS to PhD program must complete the 4 required core courses, three 6000 level breadth courses, and three occurrences the CSE 6397 research class before attempting the Diagnostic Evaluation. See course list below.

Note that most students with a CSE background may have already passed a majority of these courses before entering the PhD program. In this case, the student is not be required to retake the courses, but rather would take other classes under the direction from their supervising professor. The diagnostic evaluation must be requested by the student in the CSE Milestones app and the final decision entered by the supervisor in the app as well.

For PhD in Computer Science students:

- CSE 5311 - Design and Analysis of Algorithms
  and three of the following:
- CSE 5301 - Data Analysis and Modeling Techniques
- CSE 5306 - Distributed Systems
- CSE 5317 - Design and Construction of Compilers
- CSE 5350 - Computer Systems Architecture or CSE 5351 - Parallel Processing

For PhD in Computer Engineering students:

- CSE 5311 - Design and Analysis of Algorithms
- CSE 5301 - Data Analysis and Modeling Techniques
- CSE 5306 - Distributed Systems
- CSE 5317 - Design and Construction of Compilers
- CSE 5342 - Embedded Systems II
- CSE 5350 - Computer Systems Architecture or CSE 5351 - Parallel Processing
- CSE 5354 - Real-time Operating Systems (or CSE 6351 when co-listed)

The purpose of the breadth courses is to give the student a well-rounded CSE education and exposure to topics outside their specialty. Students have a choice of 3 courses out of a 9 possible breadth areas. The breadth areas reflect the main areas of emphasis of the CSE department and may change to include new areas over time. Currently, students may choose from the following breadth areas:

- Big Data Management/Databases/Cloud Computing

- Embedded Systems

- Imaging/Health Informatics/Bioinformatics

- Intelligent Systems/Robotics

- Networks/IoT/Communications

- Security/Privacy

- Software Engineering

- Systems/Architecture/Languages

- Data Analytics/Algorithms/Theory

General course work to support each of the above areas is available. Other areas are possible if the appropriate faculty is willing to support them.

Comprehensive Exam

The comprehensive exam is intended to test the student's ability to comprehend quality research through critical

analysis and to present their analysis to an audience, in this case the supervising committee. A student will be given at most two chances to pass the exam. The exam has two components: A written portion and an oral portion. The request for the comprehensive exam must be submitted by the student in the CSE Milestones app and the final result must be reported by the supervisor in the app. The final result must also be submitted to the UTA Office of Records.

At the request of the Supervising Professor, each member of the student's supervising committee sends the student one or two technical papers to read and questions to answer related to the papers. The total number of questions from all committee members should be no fewer than five but no more than ten. The student should be given approximately two weeks to provide responses to the questions in written form to the committee. This constitutes the written part of the exam. The student and committee then meet for an oral presentation by the student, at which time the committee tests the student's understanding of the technical content of the assigned papers. This constitutes the oral part of the exam.

Research Proposal

The research proposal serves two purposes, to showcase the work the student has completed on the topic of planned dissertation study, and secondly, it allows the student to propose the work they plan to pursue towards completion of a dissertation. At the committee's discretion, the student may be required to make an oral presentation. The student must request the research proposal in the CSE Milestones app and the final result must be reported by the supervising professor in the app.

Dissertation

The most clearly distinguishing characteristic of a program leading to the Ph.D. degree is the requirement that the candidate write a dissertation embodying the results of significant and original investigation. The dissertation must make a real contribution to the field of engineering or the applied science discipline and is expected to be a mature and competent piece of writing. The work that it reports may be scientific research, engineering research, or creative design.

All dissertations must be in the format prescribed by the student's supervising committee and must be submitted electronically to the UTA Central Library for cataloging and archiving. Details of the dissertation submission process are available from the UTA Central Library and at https://libraries.uta.edu/services/thesis-dissertation.

Dissertation Defense

The dissertation defense is the oral dissertation presentation made by the student and is open to all members of the university community and the general public. The questioning of the candidate will be directed by the student's supervising committee, but any person attending the defense may participate in the examination. Although the defense is concerned primarily with the dissertation research and content, the committee may explore the student's knowledge of areas interrelated to the core of the dissertation problem.

The student must schedule the defense in the CSE Milestone app and the final result must be reported by the supervising professor in the app. The final result must also be submitted to the UTA Office of Records.

Publication Requirements

A PhD student is required to conduct research leading to the submission of distinct, quality publications to at least one premier journal and two premier conferences.

• All papers must be related to the PhD dissertation work

• Copies of all papers and associated reviews are due when the dissertation is submitted to the committee

• Quality of submission will be established either by acceptance for publication or by the committee based on the paper's
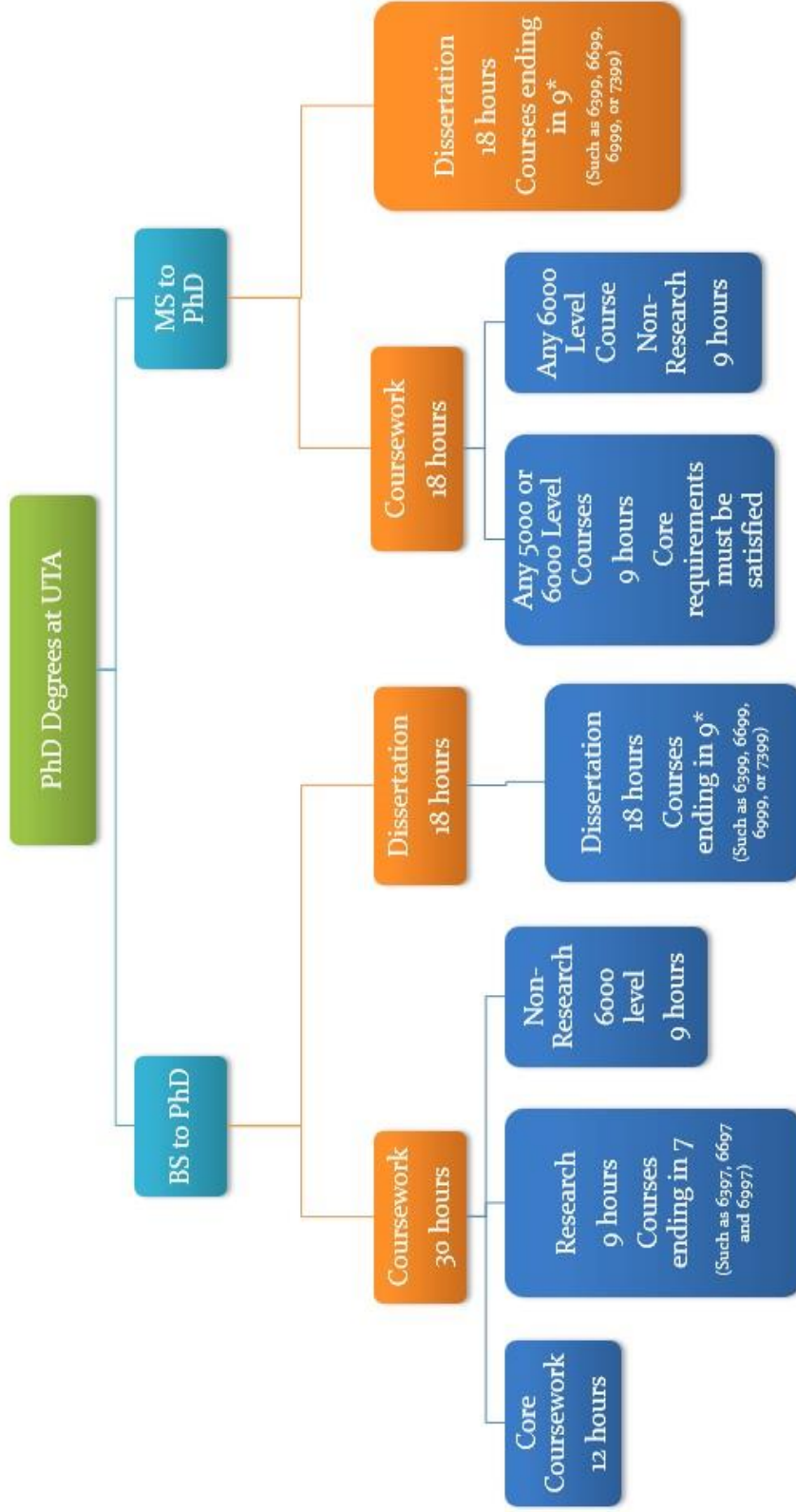
content and referee reviews/comments

Time Limit

The UTA Catalog states that all requirements for the doctoral degree must be completed within four years of the passing the comprehensive examination. Exceptions to this time limit may be approved by the supervising committee under compelling circumstances, for example for students pursuing a part-time PhD. A student's total time in the PhD program may not exceed 99 semester hours or 14 long semesters.

Change of Committee or Coursework

A student may change coursework, supervising professor, or supervising committee members at any point, subject to the approval of the Graduate Studies Committee. If the student elects to change course work after Comprehensive Exam report is filed, a "Change of Program Request" must be approved and filed. If a student changes a major professor or supervising committee member after the original research proposal has been submitted, a new research proposal will be required.

BS and MS to PhD Degrees and Hours at UTA

PhD Degrees at UTA

MS to PhD

- **Dissertation 18 hours** — Courses ending in 9* (Such as 6399, 6699, 6999, or 7399)
- **Coursework 18 hours**
  - Any 6000 Level Course — Non-Research 9 hours
  - Any 5000 or 6000 Level Courses 9 hours — Core requirements must be satisfied

BS to PhD

- **Dissertation 18 hours** — Dissertation 18 hours Courses ending in 9* (Such as 6399, 6699, 6999, or 7399)
- **Coursework 30 hours**
  - Non-Research 6000 level 9 hours
  - Research 9 hours Courses ending in 7 (Such as 6397, 6697 and 6997)
  - Core Coursework 12 hours

*CSE 6399 can only be used for hours and cannot be taken in graduating semester. CSE 7399 can only be taken once and when it is the student's intention to defend and graduate in that term.