Master of Science in Computer Science (Thesis)

About This Program

The Master of Science in Computer Science provides graduates with the latest theoretical and hands-on skills for gaining employment in the IT industry, or to prepare for continuation to a PhD program.

The thesis plan is for students interested in a more research-oriented degree. Most students will following the non-thesis plan. Both plans are explained in more detail in the CSE Master's Program Guide.

Competencies

1. Upon completion, students will be able to 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 be able to evaluate and synthesize scholarly literature and existing solutions to inform new approaches
3. Upon completion, students will be able to apply critical thinking and quantitative analysis to evaluate system performance, security, scalability, and usability
4. Upon completion, students will be able to apply advanced computing theory and knowledge to design and develop computing-based solutions
5. Upon completion, students will be able to analyze and solve computing problems using appropriate models, algorithms, tools, and technologies

Admissions Criteria

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

- An undergraduate degree, preferably in an area related to computer science, computer engineering, or software engineering.
- 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 on Computer Science/ Computer Engineering/Software Engineering related courses are emphasized.
- Relevance of the student’s degree (background) to the CSE curriculum.
- Rigor of the student’s Bachelor’s degree. A three-year degree is not considered rigorous. Note: International applicants with a “3+2” Master’s degree will be evaluated as equivalent to a 4-year Bachelor’s degree.
- Reputation of the University/College from which the student has received his/her previous degrees.
- A sum of verbal plus quantitative scores of at least 305 on the GRE. Additionally:
  - GRE quantitative score of at least 160
  - GRE verbal score of at least 145
  - The department does not require the advanced computer science test. A passing score on the Engineering in-Training (EIT) exam is also given consideration for admission decisions.
- Students may be accepted with a GRE score of 300 but may be required to complete additional coursework for their MS degree (see degree requirements found later in this document). In this case:
  - GRE quantitative score of at least 155
  - GRE verbal score of at least 145
- Students may also be accepted with up to three deficiency courses but may be required to do additional coursework for their MS degree (see degree requirements found later in this document).
- International Applicants will need to take the Test of English as a Foreign Language (TOEFL) and score at least 83 with no area score of less than 20 or take the International English Language Testing System (IELTS) and score at least 6.5 in all areas.

Note:

- Applications with significant mathematics deficiencies may be deferred/denied pending completion of the required courses.
- We neither require nor review letters of recommendation or statements of purpose from MS applicants.
- Students with (or completing in the near future) a BS awarded by the CSE department at UTA or a comparable degree from another accredited U.S. university who have a GPA of at least 3.2 should contact the graduate advisor regarding a GRE waiver. UTA CSE students with a GPA of at least 3.5 should contact the graduate advisor regarding nomination for Advanced Admission (i.e. admission without application and fee). Baseline criteria for GRE waiver and Advanced Admission are established by the Graduate Dean and can be found in the current version of the UTA Graduate Catalog.

The above criteria are used as follows in relevance to the three possible admission decisions, i.e. *Unconditional Status, Probationary Status,* and *Denied*.

UNCONDITIONAL ADMISSION

Applies to an applicant who meets the first six criteria above to a degree satisfactory to the graduate admissions committee.

PROBATIONARY ADMISSION

Applies to an applicant who meets at least five of the six criteria to a degree satisfactory to the graduate admissions committee and whose record shows promise for success in the program or to an applicant who does not fulfill all the deficiency course requirements.

DENIAL OF ADMISSION

Applies to an applicant who does not meet five of the first six criteria to a degree satisfactory to the graduate admissions committee.

WAIVER OF GRADUATE RECORD EXAMINATION

Upon recommendation of the Graduate Advisor, outstanding UT Arlington graduates may qualify for waiver of the requirements for the Graduate Record Examination (GRE). To qualify, the applicant must meet the following minimum requirements:

- The student must have graduated from a commensurate bachelor's degree program at UT Arlington no more than three academic years prior to admission to the graduate program (as measured from the start of the semester for which admission is sought). A commensurate bachelor's degree program is one that is a normal feeder program for the master's degree program to which the student seeks admission. Undergraduate students in their final year of study are also eligible; in such cases, admission with the GRE waiver is contingent upon successful completion of the bachelor's degree.
- The student's UT Arlington grade-point average must equal or exceed 3.0 in the following calculations:
  - As calculated for admission to the Graduate School;
  - Overall;
  - In the major field; and
  - In all upper-division work.

Applicants qualifying for waiver of GRE who do not qualify for advanced admission, must comply with all other requirements for admission, i.e., submitting the application for admission, paying fees, providing official transcripts from other institutions, and meeting any requirements established by the admitting graduate program. The GRE waiver must be recommended by the Graduate Advisor at the time of admission. The waiver of GRE program applies to applicants for master's degree programs only. Some programs may require higher grade-point averages to qualify, and some will not waive the GRE under any circumstances.

Additionally, some programs may waive the GRE requirement for non-UT Arlington graduates who seek admission as a master's student and meet qualifications listed in those programs' specific admission requirements. Such waivers are not offered by all graduate programs.

Curriculum

MS CS Foundations		
CSE 5311	DESIGN AND ANALYSIS OF ALGORITHMS	3
Select one from the following:		3
CSE 5301	DATA ANALYSIS & MODELING TECHNIQUES	
CSE 5306	DISTRIBUTED SYSTEMS	
CSE 5317	DESIGN AND CONSTRUCTION OF COMPILERS	
CSE 5350	COMPUTER ARCHITECTURE II	
CSE 5351	PARALLEL PROCESSING	
MS CS Specialization		
From one of the following specializations, select 3 courses at least one of which must be at the 6000 level. Individual courses may not be offered every semester. Students should take care to build a plan from available options.		9
Big Data Management/Databases/Cloud Computing		
CSE 5330	DATABASE SYSTEMS	
CSE 5331	DBMS MODELS AND IMPLEMENTATION TECHNIQUES	
CSE 5333	CLOUD COMPUTING	
CSE 5334	DATA MINING	
CSE 5335	WEB DATA MANAGEMENT	
CSE 5339	SPECIAL TOPICS IN DATABASE SYSTEMS	
CSE 5362	SOCIAL NETWORKS AND SEARCH ENGINES	
CSE 6331	ADVANCED TOPICS IN DATABASE SYSTEMS	
CSE 6332	CLOUD COMPUTING & BIG DATA	

CSE 6339	SPECIAL TOPICS IN ADVANCED DATABASE SYSTEMS
CSE 6363	MACHINE LEARNING
Embedded Systems	
CSE 5342	EMBEDDED SYSTEMS II
CSE 5352	IoT AND NETWORKING
CSE 5354	REAL-TIME OPERATING SYSTEMS
CSE 5355	ELECTROMECHANICAL SYSTEMS AND SENSORS
CSE 5356	SYSTEM ON CHIP (SoC) DESIGN
CSE 5357	ADVANCED DIGITAL LOGIC DESIGN
CSE 5358	MICROPROCESSOR SYSTEMS
CSE 5372	RISC PROCESSOR DESIGN
CSE 5373	GENERAL PURPOSE GPU ARCHITECTURE
CSE 6351	ADVANCED TOPICS IN COMPUTER ENGINEERING
CSE 6353	COMPUTER ENGINEERING SYSTEM DESIGN
Another course approved by advisor.	
Imaging/Health Informatics/Bioinformation	
CSE 5348	MULTIMEDIA SYSTEMS
CSE 5365	COMPUTER GRAPHICS
CSE 5370	BIOINFORMATICS
CSE 5379	SPECIAL TOPICS IN BIOINFORMATICS
CSE 5389	SPECIAL TOPICS IN MULTIMEDIA, GRAPHICS, & IMAGE PROCESSING
CSE 6366	DIGITAL IMAGE PROCESSING
CSE 6367	COMPUTER VISION
CSE 6379	SPECIAL TOPICS IN ADVANCED BIOINFORMATICS
CSE 6389	SPECIAL TOPICS IN ADVANCED MULTIMEDIA, GRAPHICS, & IMAGE PROCESSING
Another course approved by advisor.	
Intellegent Systems/Robotics	
CSE 5301	DATA ANALYSIS & MODELING TECHNIQUES
CSE 5334	DATA MINING
CSE 5355	ELECTROMECHANICAL SYSTEMS AND SENSORS
CSE 5360	ARTIFICIAL INTELLIGENCE I
CSE 5361	ARTIFICIAL INTELLIGENCE II
CSE 5362	SOCIAL NETWORKS AND SEARCH ENGINES
CSE 5364	ROBOTICS
CSE 5365	COMPUTER GRAPHICS
CSE 5367	PATTERN RECOGNITION
CSE 5368	NEURAL NETWORKS
CSE 5369	SPECIAL TOPICS IN INTELLIGENT SYSTEMS
CSE 5383	INTRODUCTION TO UNMANNED VEHICLE SYSTEMS
CSE 5384	UNMANNED VEHICLE SYSTEM DEVELOPMENT
CSE 6363	MACHINE LEARNING
CSE 6366	DIGITAL IMAGE PROCESSING
CSE 6367	COMPUTER VISION
CSE 6369	SPECIAL TOPICS ADVANCED INTELLIGENT SYSTEMS
Another course approved by advisor.	
Networks/IoT/Communications	
CSE 5344	COMPUTER NETWORKS
CSE 5345	FUNDAMENTALS OF WIRELESS NETWORKS
CSE 5346	NETWORKS II
CSE 5347	FUNDAMENTALS OF BLOCKCHAIN & CRYPTOCURRENCY TECHNOLOGIES
CSE 5349	SPECIAL TOPICS IN NETWORKING
CSE 5352	IoT AND NETWORKING

CSE 5366	DIGITAL SIGNAL PROCESSING
CSE 5377	WIRELESS COMMUNICATION SYSTEMS
CSE 6344	ADVANCED TOPICS IN COMMUNICATION NETWORKS
CSE 6345	PERVASIVE COMPUTING & COMMUNICATIONS
CSE 6347	ADVANCED WIRELESS NETWORKS & MOBILE COMPUTING
CSE 6348	EMBEDDED SYSTEM NETWORKING
CSE 6349	SPECIAL TOPICS IN ADVANCED NETWORKING
CSE 6350	ADVANCED TOPICS IN COMPUTER ARCHITECTURE
CSE 6388	SPECIAL TOPICS IN ADVANCED INFORMATION SECURITY
Another course approved by advisor.	
Security/Privacy	
CSE 5380	INFORMATION SECURITY 1
CSE 5381	INFORMATION SECURITY 2
CSE 5382	SECURE PROGRAMMING
CSE 5388	SPECIAL TOPICS IN INFORMATION SECURITY
CSE 6348	EMBEDDED SYSTEM NETWORKING
CSE 6350	ADVANCED TOPICS IN COMPUTER ARCHITECTURE
CSE 6388	SPECIAL TOPICS IN ADVANCED INFORMATION SECURITY
CSE 6389	SPECIAL TOPICS IN ADVANCED MULTIMEDIA, GRAPHICS, & IMAGE PROCESSING
Another course approved by advisor.	
Software Engineering	
CSE 5320	SPECIAL TOPICS IN SOFTWARE ENGINEERING
CSE 5321	SOFTWARE TESTING
CSE 5322	SOFTWARE DESIGN PATTERNS
CSE 5323	SOFTWARE ENGINEERING PROCESSES
CSE 5324	SOFTWARE ENGINEERING: ANALYSIS, DESIGN, AND TESTING
CSE 5325	SOFTWARE ENGINEERING: MANAGEMENT, MAINTENANCE, AND QUALITY ASSURANCE
CSE 5326	REAL-TIME SOFTWARE DESIGN
CSE 5327	TELECOMMUNICATIONS SOFTWARE DEVELOPMENT
CSE 5328	SOFTWARE ENGINEERING TEAM PROJECT I
CSE 5329	SOFTWARE ENGINEERING TEAM PROJECT II
CSE 5335	WEB DATA MANAGEMENT
CSE 5382	SECURE PROGRAMMING
CSE 6321	ADVANCED AUTOMATION TESTING
CSE 6323	AGILE SOFTWARE DEVELOPMENT
CSE 6324	ADVANCED TOPICS IN SOFTWARE ENGINEERING
CSE 6329	SPECIAL TOPICS IN ADVANCED SOFTWARE ENGINEERING
CSE 6332	CLOUD COMPUTING & BIG DATA
Another course approved by advisor.	
Systems/Architecture/Languages	
CSE 5306	DISTRIBUTED SYSTEMS
CSE 5307	PROGRAMMING LANGUAGE CONCEPTS
CSE 5317	DESIGN AND CONSTRUCTION OF COMPILERS
CSE 5333	CLOUD COMPUTING
CSE 5348	MULTIMEDIA SYSTEMS
CSE 5350	COMPUTER ARCHITECTURE II
CSE 5351	PARALLEL PROCESSING
CSE 5354	REAL-TIME OPERATING SYSTEMS
CSE 5358	MICROPROCESSOR SYSTEMS
CSE 5359	SPECIAL TOPICS IN COMPUTER ENGINEERING
CSE 5372	RISC PROCESSOR DESIGN
CSE 5373	GENERAL PURPOSE GPU ARCHITECTURE

CSE 5383	INTRODUCTION TO UNMANNED VEHICLE SYSTEMS	
CSE 5384	UNMANNED VEHICLE SYSTEM DEVELOPMENT	
CSE 6306	ADVANCED TOPICS IN OPERATING SYSTEMS	
CSE 6348	EMBEDDED SYSTEM NETWORKING	
CSE 6349	SPECIAL TOPICS IN ADVANCED NETWORKING	
CSE 6350	ADVANCED TOPICS IN COMPUTER ARCHITECTURE	
CSE 6351	ADVANCED TOPICS IN COMPUTER ENGINEERING	
CSE 6352	FAULT TOLERANT SYSTEMS	
CSE 6353	COMPUTER ENGINEERING SYSTEM DESIGN	
CSE 6359	ADVANCED TOPICS IN SYSTEMS & ARCHITECTURE	
Another course approved by advisor.		
Data Analytics/Algorithms/Theory		
CSE 5301	DATA ANALYSIS & MODELING TECHNIQUES	
CSE 5307	PROGRAMMING LANGUAGE CONCEPTS	
CSE 5311	DESIGN AND ANALYSIS OF ALGORITHMS	
CSE 5314	COMPUTATIONAL COMPLEXITY	
CSE 5315	NUMERICAL METHODS	
CSE 5316	MODELING, ANALYSIS, AND SIMULATION OF COMPUTER SYSTEMS	
CSE 5317	DESIGN AND CONSTRUCTION OF COMPILERS	
CSE 5318	APPLIED GRAPH THEORY AND COMBINATORICS	
CSE 6311	ADVANCED COMPUTATIONAL MODELS AND ALGORITHMS	
CSE 6314	ADVANCED TOPICS IN THEORETICAL COMPUTER SCIENCE	
CSE 6319	SPECIAL TOPICS IN ADVANCED THEORY AND ALGORITHMS	
Another course approved by advisor.		
Breadth Courses		
Select 6 hours of CSE or external approved coursework in consultation with a CSE graduate advisor; these courses should not come from a selected speciality area.		6
Completion Options		
Select one of the following completion options.		9-15
Thesis		9
Select an additional course in the chosen speciality area.		
CSE 5698	MASTER'S THESIS II	
Non-thesis		15
Select 3 courses in an additional area of sepecialization at least one of which must be at the 6000 level		
Select 6 hourse of CSE 53xx or 63xx from any CSE specialty area		
Total Hours		**30-36**

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/)