

M.S. in Computer Science Student Handbook

(Effective Fall 2018)

The Department of Computer Science offers advanced studies leading to a Master of Science degree in Computer Science. Our MS degree program in Computer Science is driven by two distinct needs that are fueled by the growth in technological companies and jobs in the Middle Tennessee and Upper Cumberland regions. These needs include:

- Opportunities for personnel from surrounding industries to upgrade their professional skills.
- A strong academic program that prepares graduates to pursue a terminal (PhD) degree in Computer Science.

In order to meet the needs listed above, the following **learning objectives** are emphasized by the Master's program:

1. The student should gain breadth of knowledge in the discipline and depth in the specific area of his/her specialization.
2. The student should learn and gain experience in doing independent academic work.
3. The student should demonstrate knowledge of the techniques, methods, and disciplines of computer science research.

Advisory Committee

Each MS student will have an advisory committee comprised of at least three members. The advisory committee shall be chaired or co-chaired by a CS faculty member and include an additional member from the CS Department. Other members of the advisory committee may be from outside of CS department. This graduate committee may be appointed during the student's first term, but no later than the term in which 15 credit hours of graduate work are to be completed.

At the discretion of the chairperson of the committee, the advisory committee may include more than three members. If desired, two members of the committee may serve as co-chairs of the committee. If a student is not able to identify a sufficient number of faculty who are suitable and willing to serve on her/his advisory committee, the student will be advised by the departmental chairperson that he/she should either change her/his area of research interests to more closely match those of the available faculty, or consider selecting another major. Failure to form a committee is cause for transfer to non-degree status.

Program of study

Each M.S. student must file a program of study containing the schedule of the courses they will complete to fulfill the degree requirements by the time 15 semester hours have been earned but no later than the end of the student's second semester. Each proposed program of study must be approved by the student's advisory committee, the departmental chairperson, and the Associate Dean of Graduate Studies.

Probation for unsatisfactory performance

A graduate student is required to maintain a cumulative grade point average of at least "B" (3.0). When a student's cumulative average falls below 3.0, but not less than 2.0, the student will be placed on probation. If the cumulative average falls below 2.0, the student will be dismissed.

If the term average, on all courses presented as part of the hours required for graduation, during any semester is less than 2.0, the student's record will be reviewed and may be placed on probation.

Dismissal for unsatisfactory performance

A graduate student will be dismissed from the graduate program if any one of the following conditions occurs:

- Two consecutive semesters of probation and recommendation by the student's advisory committee. Summer semester is not included as one of the consecutive semesters if no courses are taken during this term in which a grade of "A" through "F" is assigned.
- Two "F" grades in courses presented as part of the hours required for graduation
- Two consecutive semesters of "No Progress" grades assigned in thesis and recommendation by the student's advisory committee.

A student who has been dismissed for unsatisfactory performance may request reinstatement, provided he/she produces evidence of extenuating circumstances that would prevent dismissal. The request must be approved by the department chair, director of the student's graduate program, the dean of the college, and the Graduate School Executive Committee. The decision of the Graduate School Executive Committee is final.

Curriculum

A student may choose a thesis, project, or course option, and all students must take a comprehensive exam that covers their core coursework and area of specialization.

Thesis Option:

A thesis option requires 31 semester credit hours of graduate work, including 24 hours of coursework, one hour of graduate seminar, and 6 hours of graduate thesis approved by the advisory committee. A student may take maximum of 9 hours of 5000-level courses. A student may take maximum of 3 hours of directed independent study courses to satisfy the required 24 hours of coursework.

Project Option:

A non-thesis project option requires 34 semester credit hours of graduate work, including 30 hours of course work, one hour of graduate seminar, and 3 hours of project work (CSC6980) approved by the advisory committee. A student may take maximum of 9 hours of 5000-level courses. A student may take maximum of 3 hours of directed independent study courses to satisfy the required 30 hours of coursework.

Course Option:

A non-thesis project option requires 34 semester credit hours of graduate work, including 30 hours of course work, one hour of graduate seminar, and 3 hours of directed independent study. A student may take maximum of 9 hours of 5000-level courses. A student has to pass a written/oral comprehensive exam set by his/her graduate committee.

***Students of Thesis or Project option must complete a final presentation and defense exam in the thesis/project related area.**

Students must complete the following courses:

- Graduate Seminar (1 hour)
- Core Theory (3 hours)
- Fundamentals (6 hours)
- Specialization in an approved area (9 hours)
- Approved Electives (6 hours for thesis option; 12 hours for non-thesis option)

List of Courses

Graduate Seminar (1 hour):

- CSC 6910 – Graduate Seminar

Fundamentals (6 hours):

- CSC 5240 - Artificial Intelligence (Knowledge Discovery area)
- CSC 5575 – Information Assurance and Security (Information Assurance and Security area)
- CSC 5760 – Parallel Programming (Parallel and Distributed Computing area)

A student who has taken any of these courses for undergraduate credit may use the undergraduate course to meet the graduate Fundamental Areas requirement and substitute another graduate-level course approved by the student's advisory committee.

Core Theory (3 hours):

- CSC 5400 – Analysis of Algorithms
- CSC 5450 – Introduction to Automata Theory and Computation
- MATH 6450 – Advanced Theory of Computation

Specialization (9 hours from one area of specialization):

Parallel and Distributed Computing

- CSC 5760 – Parallel Programming
- CSC 6740 – Parallel and Distributed Algorithms
- CSC 6720 – Internet Protocols
- CSC 6780 – Distributed Computing
- CSC 6760 – Grid Computing
- CSC 6730 – Advanced Networking

Information Assurance and Security

- CSC 5575 – Information Assurance and Security
- CSC 6575 – Internet Security
- CSC 6580 – Advanced Reverse Engineering
- DS 5260 – Network Security and Forensics
- DS 5125 – Computer Forensics and Investigations

Knowledge Discovery

- CSC 5220 – Data Mining and Machine Learning
- CSC 5240 - Artificial Intelligence
- CSC 6220 – Data Mining
- CSC 6230 – Machine Learning
- CSC 6250 – Knowledge-Based/Expert Systems

*** A student can apply a class taken as part of fundamentals to fulfill 9 hours of area specialization requirement.**

**** A student can apply CSC 6900 (Advanced Topics) to fulfill 9 hours area specialization requirement if approved by student's advisory committee.**

Possible Electives:

- CSC 5010 – Programming Languages
- CSC 5200 – Computer Networks
- CSC 5100 – Operating Systems
- CSC 5320 – Computer Architecture
- CSC 5580 – Software Reverse Engineering
- CSC 6300 – Web Based Data base
- CSC 6400 – Internet Algorithmics
- CSC 6901/6902/6903 – Advanced Topics
- CSC 6801/6802/6803 – Directed Independent Study
- MATH 6170 – Experimental Design I
- MATH 6180 – Experimental Design II
- ME 5140 – Introduction to Robotics
- ME 6640 – Advanced Robotics
- ECE 6130 – Computer Architecture
- ECE 6140 – Parallel Processing Systems