Computer Science
TENNESSEE TECH

Effective Date: Fall 2023

The Computer Science (CS) graduate program offers a **Masters in Computer Science** (MSCS). The MS program has three options: *thesis*, *project*, or *courses-only*. Each MS student must take a *comprehensive ex*am that covers his or her core coursework and area of specialization. The student will have an *Advisory Committee* comprised of at least three members. The chair of the committee must be a CS graduate faculty member, at least two members (including the chair) must also be from the CS department, and the third member can be a TTU faculty member from outside of the CS department.

MS Program Options:

***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 a maximum of 9 hours of 5000-level courses. A student may take a 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 27 hours of coursework, one hour of graduate seminar, and 6 hours of project work (CSC6980) approved by the advisory committee. A student may take a maximum of 9 hours of 5000-level courses. A student may take a 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 coursework, one hour of graduate seminar, and 3 hours of directed independent study. A student may take a 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**.

An MS student must complete the following courses:

- Graduate Seminar (1 Credit Hour)
- Core Theory (3 Credit Hours)
- Specialization in an Approved Area (9 Credit Hours)
- Other Specialized Areas (6 Credit Hours from Two Other Specialized Areas – 3 hours from each of them)
- Electives (6 Credit Hours for Thesis Option; 12 Credit Hours for Project Option; 15 Credit Hours for Course Option)

- Thesis (6 Credit Hours for Thesis Option)
- Project (3 Credit Hours for Project Option)

List of Courses

Graduate Seminar (1 hour):

- CSC 6910 – Graduate Seminar

Core Theory (3 hours):

- CSC 5400 – Analysis of Algorithms
- CSC 6240 – Mathematics and Theory of Machine Learning
- CSC 6400 – Advanced Analysis of Algorithms
- MATH 6360 – Graph Theory

Specialization (9 hours from one area of specialization + 6 hours from two other areas of specialization)[1]:

- ***Parallel and Distributed Computing***

  CSC 5760 – Parallel Programming
  CSC 5770 – Distributed & Cloud Computing
  CSC 6730 – Advanced Networking
  CSC 6740 – Parallel and Distributed Algorithms
  CSC 6780 – Distributed Computing
  CSC 6903 – Special Topics (related to Parallel and Distributed Computing)
  CSC 7560 – Advanced Networking and Next Gen Internet Protocols[2]
  CSC 7720 – Distributed Operating Systems[2]
  CSC 7750 – Topics in High-Performance Computing[2]

- ***Information Assurance and Security***

  DS 5125 – Computer Forensics and Investigation
  DS 5260 – Network Security and Forensics
  CSC 5575 – Cryptography/Network Security
  CSC 5585 – Software and Systems Security
  CSC 6570 – Cloud Security Fundamentals and Practices
  CSC 6575 – Internet Security
  CSC 6580 – Advanced Reverse Engineering
  CSC 6585 – Secure Software Development
  CSC 6590 – Application Security
  CSC 6903 – Special Topics (related to Information Assurance and Security)

[1] Given the wide range of possible specialization areas in the field of Computer Science, a student may, working closely with the Chair of their Advisory Committee, choose to build a different specialization area. The criteria is the same as the existing specialization areas, except that 9 hours of specialization will be from a different set of courses as defined by the Advisory Committee.

[2] While MS students can take 7xxx courses, it is recommended that students continuing on to a PhD delay taking such courses.

CSC 7570 – AI Assisted Cyber Security[2]
CSC 7575 - Cyber Physical System Security[2]

- ***Artificial Intelligence***

  CSC 5220 – Data Mining and Machine Learning
  CSC 5240 - Artificial Intelligence
  CSC 5260 – Advanced Data Science & Applications
  CSC 6220 – Data Mining
  CSC 6230 – Machine Learning
  CSC 6260 – Advanced Topics in Artificial Intelligence
  CSC 6903 – Special Topics (related to Artificial Intelligence)
  CSC 7210 – Anomaly and Intrusion Detection Systems[2]
  CSC 7240 – Intelligent Information Systems[2]

Other Possible Electives (outside of Computer Science)[3]:

- MATH 5060 – Topics in Cryptography
- MATH 6170 – Experimental Design I
- MATH 6180 – Experimental Design II
- MATH 6460 – Computational Methods for Graphs and Modelling

Thesis (6 hours):

- CSC 6990 Research & Thesis

Project (3 hours):

- CSC 6980 - Non-Thesis Design Project

Courses Only – Directed Independent Study (3 hours):

- CSC 6803 – Directed Independent Study

The following should also be noted regarding all MS students in Computer Science:

1. A student can apply up to one CSC 6803 (Directed Independent Study) and two CSC 6903 (Special Topics) in the Program of Study, or courses from another discipline if approved by the student's Advisory Committee.
2. A student can take a course (e.g., ECE 6900 – Special Topics in Electrical Engineering) from different departments across the university towards ONE specialization course if his or her Advisory Committee approves.
3. A student can take courses from different departments across the university as electives if his or her Advisory Committee approves.

[3] The list of possible electives is not intended to be comprehensive – student should consult with their Advisor regarding relevant courses.