COMPUTER SCIENCE

Degree Requirements

Master of Science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (https://gradschool.psu.edu/graduate-education-policies/)

A total of 30 credits (400-, 500-, 600-, or 800-level) is required for the Master of Science in Computer Science. Students are required to take the following courses:

Code	Title	Credits
Required Courses		
COMP 505	Theory of Computation	3
COMP 511	Design and Analysis of Algorithms	3
COMP 512	Advanced Operating Systems	3
COMP 519	Advanced Topics in Database Management Systems	3
Total Credits		**12**

Additionally, students are required to complete either a thesis or a paper according to one of the two options described below. Students who believe that they have completed a course substantially similar to one of the specific course requirements may apply to have their previous work evaluated for the purpose of exemption to that requirement. If the exemption is granted, another approved course shall be taken in place of that required course. The remaining 18 credits must be completed according to one of the following options:

Thesis Option

Research into a specific computer science problem, development of a scholarly written paper, and an oral defense. This option requires:

Code	Title	Credits
COMP 600	Thesis Research	6
3 credits from approved 500-level electives in computer science, mathematics, engineering, and information systems courses		3
9 credits from approved 400- and 500-level electives in computer science, mathematics, engineering, and information systems courses		9
Total Credits		**18**

Paper Option

In-depth study of specific computer science problems, development of a written paper or project, and an oral defense. This option requires:

Code	Title	Credits
COMP 594	Master's Studies	3
9 credits from approved 500-level electives in computer science, mathematics, engineering, and information systems courses		9
6 credits from approved 400- and 500-level electives in computer science, mathematics, engineering, and information systems courses		6
Total Credits		**18**

A maximum of 9 transfer credits will be allowed for course work completed as a graduate student at another institution, subject to restrictions outlined in GCAC-309 Transfer Credit (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/transfer-credit/).

Suggested Tracks

For students with interests in the areas of software engineering, systems programming, and artificial intelligence, the program suggests the following course work. These tracks are only advisory--there is no requirement that a student follow any track, and tracks will not be noted on diplomas or transcripts.

Track in Software Engineering

Students following the track in software engineering will be provided with the conceptual tools needed for designing and managing large software systems. In addition to the required core, the track in software engineering consists of the following courses:

Code	Title	Credits
COMP 513	Formal Methods for Software Engineering	3
COMP 516	Advanced Programming Languages	3
INFSY 570	Software Engineering in the Analysis and Design of Information Systems	3

In addition to these courses, CMPSC 470 is highly recommended, as compiler development is an ideal environment for gaining practical experience with software engineering techniques and tools.

Track in Systems Programming

Students following the track in systems programming will receive instruction in both the conceptual foundation of systems software and the implementation of such systems. In addition to the required core, the track in systems programming consists of the following courses:

Code	Title	Credits
CMPSC 436	Communications and Networking	3
COMP 517	Computer Security	3
COMP 545	Computer Architecture	3

Track in Artificial Intelligence

Students following the track in artificial intelligence are expected to gain an understanding in the theory and applications of AI methods as well as evolutionary methods for solving a variety of problems. In addition to the required core, the track in artificial intelligence consists of the following courses:

Code	Title	Credits
COMP 520	Artificial Intelligence	3
COMP 524	Evolutionary Computation	3
COMP 556		