

# Master of Science Degree Computer Science (G704) Program Guide (eff. Fall 2024)

## Program Information

The Master of Science in Computer Science will provide individuals with the opportunity to acquire an excellent graduate level education in Computer Science that prepares them to work in a variety of computer related fields, including education, industry, research, business, and government.

The M.S. in Computer Science is designed for individuals with a B.S. in Computer Science who are looking to expand their knowledge and opportunities. Students with a bachelor's degree in another discipline may also apply for the M.S. in Computer Science after meeting certain eligibility criteria. This degree can be completed as a full-time or part-time student. Most classes are offered in the evening to enable students to complete their degree while working.

Rowan University undergraduates majoring in the Bachelor of Science in Computer Science program may apply to the Advanced Dual Degree (4+1) program which allows them to earn both the Bachelor of Science and Master of Science degrees in five years instead of six.

## Program Requirements

The M.S. in Computer Science is a 31 credit-hour program with an optional thesis track. Eleven distinct courses must be taken to fulfill the Master's Degree. Any course taken that belongs in multiple categories cannot double count. Up to two courses may be taken from other appropriate graduate programs, subject to advisor approval, provided all requirements for this MS degree are fulfilled.

Tracks:

The program includes two tracks – a thesis track and a non-thesis track.

- **Non-Thesis Track:** Students choosing the non-thesis track will take 31 credits of traditional (non-thesis) courses.
- **Thesis Track:** Students choosing the thesis track will also take 31 credits, but they will substitute between 6 to 9 credits of thesis courses for traditional (non-thesis) courses.

Algorithms Core:

- All students must complete a 3 credit Algorithms Core course

Common Core:

- All students must complete 9-credits of Common Core courses.

Advanced Courses:

- All students must complete 9-credits of advanced (600 level) courses. Thesis II and Thesis III courses will fulfill this requirement for thesis-track students.

Students accepted into the program are expected to be well versed in programming, discrete mathematics, computer organization/architecture, direct interactions with operating systems, data structures, and algorithmic thinking either through undergraduate course work or work experience. Students not meeting all of these criteria may be accepted into this master's program but will be required to complete one or two computer science bridge courses before enrolling into other computer science graduate courses. These courses are:

- CS 01501 Essential of Computer Science I\*
- CS 01502 Essentials of Computer Science II\*

*\*CS 01501 and CS 01502 will not count toward the 31 graduate credits needed for degree completion.*

## Required Courses – 4 s.h.

Course #	Course Name	Course Attributes / Notes	Sem/Yr	Grade	Credits
CS 00500	Computer Science Graduate Seminar				1
CS 07540	Advanced Design & Analysis of Algorithms				3
<b>Subtotal: 4 s.h.</b>					

## Core Courses – 9 s.h.

Students are required to complete at least one course in each of any **three of the five** Common Core areas below:

### Algorithms and Theory

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 07510	Mathematical Foundations of Computer Science				3
CS 07556	Machine Learning I				3
CS 07622	Advanced Theory of Computing	Counts as advanced course			3
CS 07650	Concepts in Artificial Intelligence	Counts as advanced course			3
CS 07652	Cryptographic Algorithms†	Counts as advanced course			3
CS 07656	Machine Learning II	Counts as advanced course			3

### Software Design

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 04515	Embedded Systems Programming				3
CS 04524	Agile Software Engineering				3
CS 04563	Parallel and Concurrent Programming				3
CS 04580	Human Centered Computing				3
CS 04623	Advanced Software Engineering	Counts as advanced course			3
CS 04670	Advanced Object Oriented Design	Counts as advanced course			3

### Cybersecurity

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 03551	Advanced Cyber Security: Principles & Applications				3
CS 03570	Cyber Defense of Operating Systems and Networks				3
CS 03580	Cloud Computing and the Internet of Things - Architectures and Security†				3
CS 07652	Cryptographic Algorithms†	Counts as advanced course			3
CS 09612	Network Security†	Counts as advanced course			3

### Data Management and Analytics

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 02505	Data Mining I				3
CS 02530	Advanced Database Systems: Theory and Programming				3
CS 02605	Data Mining II	Counts as advanced course			3
CS 02620	Data Warehousing	Counts as advanced course			3
CS 02625	Data Quality & Web Text Mining	Counts as advanced course			3
CS 02630	Advanced Topics in Database Systems	Counts as advanced course			3

### Computer Networks

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 03580	Cloud Computing and the Internet of Things - Architectures and Security†				3
CS 09510	Computer Networks				3
CS 09605	Wireless Networks & Systems	Counts as advanced course			3
CS 09612	Network Security†	Counts as advanced course			3
CS 09675	Advanced TCP/IP & Internet Protocols & Technologies	Counts as advanced course			3

†course can count from one of two course areas but cannot count for both core areas

## Advanced Courses – 9 s.h.

*Students must complete three 600-level courses to obtain the Master's Degree. Note: These courses are listed in areas below and can fulfill a core course requirement, as well, so long as ten distinct courses have been taken.*

## Remaining Courses – 9 s.h.

### *Thesis-track*

*Students may take either 6 credits of thesis and 1 elective, or they may take 9 credits of thesis. If thesis track is chosen, students must successfully complete and defend a Master's Thesis.*

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 07530	Computer Science Thesis I				3
CS 07631	Computer Science Thesis II				3
CS 07632	Computer Science Thesis III (optional)				3
<b>Subtotal: 6-9 s.h.</b>					

### *Non thesis-track*

*Students must take 9 credits of electives, they may not take any thesis courses. Electives can be chosen from the core banks as well.*

Course #	Course Name	Notes	Sem/Yr	Grade	Credits
CS 01541	Bioinformatics - Advanced Computational Aspects				3
CS 02570	Information Visualization				3
CS 04548	Programming Languages: Theory, Implementation & Application				3
CS 04564	Compiler Design Theory				3
CS 04565	System Programming				3
CS 04571	Advanced Topics in Mobile Programming				3
CS 04590	Computer Game Design & Development				3
CS 04605	Advanced Web Programming	Counts as advanced course			3
CS 06520	Topics in Computer Architecture				3
CS 06560	Design & Implementation of Operating Systems				3
CS 07565	Computer Vision				3
CS 07645	Advanced Robotics	Counts as advanced course			3
CS 07655	Natural Language Processing	Counts as advanced course			3
CS 07695	Advanced Topics in Computer Science	Counts as advanced course			3
CS 08560	Computer Graphics				3
CS 08680	Computer Animation	Counts as advanced course			3
<b>Subtotal: 9 s.h.</b>					

### Graduation/Exit, Benchmark, and/or Thesis Requirements

If thesis track is chosen, students must successfully complete and defend Master's Thesis.

### Minimum Required Grades and Cumulative GPA

The Master of Science in Computer Science is a Category 3 program.

For details regarding satisfactory academic progress and graduation requirements, please visit University Policies.