

Master of Science Degree Computer Science (G704) Program Guide (eff. Fall 2025)

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 |
| Subtotal: 4 s.h. | | | | | |

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 07559 | Advanced Models of Deep Learning | | | | 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 03552 | Graduate Digital Forensics | | | | 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 |
| DS 02510 | Visual Analytics | | | | 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 |
| | | | | | Subtotal: 6-9 s.h. |

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 |
| | | | | | Subtotal: 9 s.h. |

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.