

COMPUTER SCIENCE COURANT (MS)

Department Website (<http://cs.nyu.edu>)

NYSED: 07834 **HEGIS:** 0701.00 **CIP:** 11.0101

Program Description

The Department of Computer Science offers three M.S. degree programs, Masters in Computer Science (https://cs.nyu.edu/home/master/prospective_mscs.html)(MSCS), Masters in Information Systems (https://cs.nyu.edu/home/master/prospective_msis.html)(MSIS), and Master's in Computing, Entrepreneurship and Innovation (<http://cs.nyu.edu/ms-cei/>)(MS-CEI) for all prospective students. If you are an existing NYU CS undergraduate, we also offer an accelerated BA-MS (https://cs.nyu.edu/home/undergrad/accelerated_ms.html) program.

Students who obtain a Master's of Science in Computer Science are qualified to do significant development work in the computer industry or important application areas. Those who receive a doctoral degree are in a position to hold faculty appointments and do research and development work at the forefront of this rapidly changing and expanding field. Additionally, the department offers a Masters of Science in Information Systems in collaboration with the Stern School of Business. The emphasis in the MS in Information Systems program is on the use of computer systems in business. The Master of Science in Scientific Computing, just established by the Mathematics and Computer Science Departments, is designed to provide broad training in areas related to scientific computing using modern computing technology and mathematical modeling arising in various applications.

Established in 1969 as part of the Courant Institute of Mathematical Sciences, the department has experienced substantial growth in its faculty, student body, research staff, and funding. Research areas include algorithmics, computational geometry, high-level programming languages, compilers and compiler optimization techniques, parallel and distributed computing, design of computer systems, databases, artificial intelligence, natural language processing, graphics, multimedia, computer vision, mathematical programming, numerical analysis, computational biology and computational finance.

The core of the curriculum consists of courses in algorithms, programming languages, compilers, artificial intelligence, database systems, and operating systems. Advanced courses are offered in many areas such as natural language processing, the theory of computation, computer vision, software engineering, compiler optimization techniques, computer graphics, distributed computing, multimedia, networks, cryptography and security, and computational finance. Adjunct faculty, drawn from outside academia, teach special topics courses in their areas of expertise.

The Masters in Computer Science (MSCS) program is designed to make you a better thinker, a better programmer and a better system architect. It will also provide you with a good understanding of current technology. Our philosophy is to require you to master foundational topics and then let you specialize in application areas of your interest. You will gain a broad and deep understanding of many aspects of computer science, choosing among such fields as security and cryptography, graphics, scientific computing, programming languages, databases, networking,

and distributed systems, to name a few. This may enable you to become a design lead in a complex multi-faceted project.

Admissions

All applicants to the Graduate School of Arts and Science (GSAS) are required to submit the general application requirements (<https://gsas.nyu.edu/nyu-as/gsas/admissions/arc.html>), which include:

- Academic Transcripts (<https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/academic-transcripts.html>)
- Test Scores (<https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/test-scores.html>) (if required)
- Applicant Statements (<https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/statements.html>)
- Résumé or Curriculum Vitae
- Letters of Recommendation (<https://gsas.nyu.edu/nyu-as/gsas/admissions/arc/letters-of-recommendation.html>), and
- A non-refundable application fee (<https://gsas.nyu.edu/admissions/arc.html#fee>).

See Computer Science (<https://gsas.nyu.edu/admissions/arc/programs/computer-science.html>) for admission requirements and instructions specific to this program.

Program Requirements

Course	Title	Credits
Major Requirements		
CSCI-GA 1170	Fundamental Algorithms	3
CSCI-GA 2110	Programming Languages	3
CSCI-GA 2250	Operating Systems	3
CSCI-GA 3840	Master's Thesis Research	1-6
Electives		
Other Elective Credits		18
Total Credits		30

Additional Program Requirements Thesis/Capstone

Either a capstone course must be successfully completed with a grade of B or better that represents a combination of the key elements of the M.S. program of study or, if qualified and approved, write a master's thesis or complete a capstone advanced lab. In order to qualify to write a master's thesis, a student must achieve a GPA of 3.75 or better after completing six courses and complete the three foundational courses with a grade of B+ or better.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CSCI-GA 1170	Fundamental Algorithms	3
CSCI-GA 2110	Programming Languages	3
Other Elective Credits		3
		Credits
		9
2nd Semester/Term		
CSCI-GA 2250	Operating Systems	3
Other Elective Credits		3
Other Elective Credits		3
		Credits
		9

3rd Semester/Term		
Other Elective Credits		3
Credits		3
4th Semester/Term		
CSCI-GA 3840	Master's Thesis Research	1-6
Other Elective Credits		3
Other Elective Credits		3
Credits		9
Total Credits		30

Learning Outcomes

Upon successful completion of the program, graduates will have achieved the following learning outcomes:

1. **Algorithms:** By the end of their first year (for full-time students), students should be able to analyze the mathematical complexity of a wide range of algorithms and be able choose the most appropriate algorithm to use for a given programming task.
2. **Programming Languages.** By the end of their first year (for full-time students), students should understand the fundamental features of programming languages of the procedural, object-oriented, and functional language paradigms, as well as be able to write programs in a substantial number of different languages covering these paradigms.
3. **Operating Systems.** By the end of their first year (for full-time students), students should have a detailed understanding of the design and implementation of modern operating systems, including processes and synchronization, memory management, file systems, and input/output.
4. **Large-scale Software Development.** By the completion of their studies, students should have extensive skills in large scale software development and should have completed a project integrating algorithmic design, software development, and testing (by completion of the studies). In this project, students are expected to be able to implement large software components using the analysis, design, and implementation skills learned in the MSCS program.

Policies

NYU Policies

University-wide policies can be found on the New York University Policy pages (<https://bulletins.nyu.edu/nyu/policies/>).

Graduate School of Arts and Science Policies

Academic Policies for the Graduate School of Arts and Science can be found on the Academic Policies page (<https://bulletins.nyu.edu/graduate/arts-science/academic-policies/>).