

COMPUTER ENGINEERING (MS)

Electrical and Computer Engineering Department (<https://engineering.nyu.edu/academics/departments/electrical-and-computer-engineering/>)

NYSED: 22437 **HEGIS:** 0999.00 **CIP:** 14.0901

Program Description

Computer engineering makes it possible for us to telecommute from home, check our e-mail on the go, and videoconference with clients from around the world. But laptops and information networks aren't the only products computer engineers develop; they reconstruct genomes, design robots, and conceive software to make businesses more efficient.

At the Tandon School of Engineering, we want to place our students at the forefront of the telecommunications, networks, and microelectronics industries. The master's program in Computer Engineering gets you there. By teaching you the principles underlying the design and integration of computer components and systems, we make sure you have a base from which to launch improvements in the field.

Our collaborative relationships with industry and government agencies help you reach your potential, and you gain practical experience that adds to in-class explorations in a number of critical areas – everything from VLSI verification and testing to embedded systems design and computer architecture.

Many fields are open to our students, including information technology, computer design and engineering, operating systems and networks, computer architecture, and software applications, among others.

Admissions

To apply for admission to any Tandon graduate program, please contact the Office of Graduate Admissions (<https://engineering.nyu.edu/admissions/graduate/>).

Requirements

Admission to the MS program requires a bachelor's degree in computer engineering, electrical engineering or computer science from an accredited institution. Students without such prior degrees must complete appropriate undergraduate courses to remove any deficiencies in preparation. Topics in which deficiencies must be removed include logic circuits design, state analysis and synthesis techniques, computer architecture, data structures and algorithms and C or C++ programming.

Program Requirements

The program requires the completion of 30 credits, comprised of the following:

Course	Title	Credits
Core Requirements		
Select two of the following: ¹		6
ECE-GY 6353	INTERNET ARCHITECTURE & PROTOCOLS	
ECE-GY 6463	ADVANCED HARDWARE DESIGN	
ECE-GY 6473	Introduction to VLSI System Design	
ECE-GY 6483	Real Time Embedded Systems	

ECE-GY 6913	Computing Systems Architecture ²	
Electives		
ECE-GY Electives ³		18
Free Elective ⁴		3
Advanced Project		
Select one of the following: ⁵		3
ECE-GY 9953	ADVANCED PROJECT	
ECE-GY 997X	MS THESIS IN ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT	
CS-GY 9963	ADVANCED PROJECT IN COMPUTER SCIENCE	
Total Credits		30

¹ The core courses cover fundamental material and should be taken as early as possible. An advanced course subsequent to a core course may be taken in lieu of the core course, with the approval of the Program Director.

² Note that ECE-GY 6913 Computing Systems Architecture is a newly developed course that replaces CS-GY 6133 as a core course. ECE students interested in computer architecture should take this course instead of CS-GY 6133. CS-GY 6133 will be approved as a core course only if it was taken prior to Fall 2017.

³ CP-GY 9911 Internship for MS I and CP-GY 9921 Internship for MS II can be counted as ECE-GY Electives. The following ROB-GY courses may also count as ECE-GY Electives:

- ROB-GY 6003 FOUNDATIONS OF ROBOTICS
- ROB-GY 6213 ROBOT LOCALIZATION AND NAVIGATION
- ROB-GY 6323 REINFORCEMENT LEARNING AND OPTIMAL CONTROL FOR ROBOTICS
- ROB-GY 6333 NETWORKED ROBOTICS SYSTEMS, COOPERATIVE CONTROL AND SWARMING
- ROB-GY 6423 INTERACTIVE MEDICAL ROBOTICS

⁴ Students may choose another ECE-GY course here or a different type of course (non-ECE-GY) from another science, engineering, or management department at NYU.

⁵ Other courses with a significant project component may be used to satisfy the project requirement, subject to approval of the Program Director.

Note about CS-GY 6843 Computer Networking

The Electrical and Computer Engineering Department expects most students have covered the material of Computer Networking (CS-GY 6843) in an undergraduate course. Therefore, students can only take this course and have it counted towards the MS in Computer Engineering with the approval of the Program Director.

Thesis, Project, and Reading

Students are encouraged to participate in research by registering for a master's thesis (ECE-GY 997X MS THESIS IN ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT, 6 credits, can be taken over two semesters), an advanced project (ECE-GY 9953 ADVANCED PROJECT or ECE-GY 9963 ADVANCED PROJECT II, 3 credits each, ECE-GY 9941 Advanced Projects III, 1.5 credits) or a reading course (ECE-GY 9933 Readings in Electrical and Computer Engineering I, 3 credits). Students must secure a faculty member's commitment for advising such individual studies. Oral defense of the master's thesis with at least three professors (at least 2 ECE professors) in attendance is required. For the project and reading courses, a project report and an oral presentation are required.

No more than 9 total credits of thesis, projects, readings, and internships (see below) can be counted toward the MS.

Internships

Most international students must register for an internship course (CP-GY 9911 or CP-GY 9921) to participate in an internship. Students may take up to 3 credits of internship: each internship course is worth 1.5 credits. International students cannot be approved for an internship course after completing their degree requirements. The internship courses may count as ECE-GY Electives. For an internship to be approved for credit, the internship position must provide industry and/or research experience relevant to the Computer Engineering degree. All internships must be approved and supervised by an ECE faculty member. Students must secure a faculty member's commitment for advising an internship. The internship supervisor should submit a midterm and a final term evaluation report to the adviser. The student must submit a project report to the faculty adviser upon completion of the internship for the evaluation and grading of the internship course. The total credits for independent studies including MS thesis, projects, reading, and internship cannot exceed 9 credits. If a student has already taken more than 7.5 credits of independent studies, then an internship cannot be approved.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
ECE-GY Core Course 1		3
ECE-GY Core Course 2		3
ECE-GY Elective		3
Credits		9
2nd Semester/Term		
ECE-GY Elective		3
ECE-GY Elective		3
ECE-GY Elective		3
Credits		9
3rd Semester/Term		
ECE-GY Elective		3
ECE-GY Elective		3
Free Elective		3
Credits		9
4th Semester/Term		
Advanced Project Course		3
Credits		3
Total Credits		30

Learning Outcomes

Upon successful completion of the program, graduates will:

1. Have gained the principles underlying the design and integration of computer components and systems.
2. Acquire practical experience that adds to in-class explorations in a number of critical areas — everything from VLSI verification and testing to embedded systems design and computer architecture.
3. Be provided opportunities to specialize in primary subdisciplines of computer engineering, including information technology, computer design and engineering, operating systems and networks, computer architecture, and software applications, among others.

Policies

Program Policies

GPA Requirement

An overall GPA of 3.0 or above in all graduate courses taken at NYU is required. In addition, an average of 3.0 is required among the two core courses.

Out-of-Department Courses and 5000-level ECE-GY Courses

Non-ECE-GY courses numbered in the 5000-level from other departments cannot be counted towards degree requirements, except with the approval of the Program Director. The total number of credits for 5000-level ECE-GY courses and non-ECE-GY courses cannot exceed 12 credits.

Transfer Credits

No transfer credits are accepted towards the MS degree.

NYU Policies

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

Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (<https://bulletins.nyu.edu/graduate/engineering/academic-policies/>).