

COMPUTER ENGINEERING (MS)

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 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

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. The Graduate Record Exam (GRE) is required for all applicants.

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 6913	Computing Systems Architecture ²	
ECE-GY 6463	ADVANCED HARDWARE DESIGN	
ECE-GY 6473	Introduction to VLSI System Design	
ECE-GY 6483	Real Time Embedded Systems	
ECE-GY 6353	INTERNET ARCHITECTURE & PROTOCOLS	
Electives		
Select 21 credits of ECE-GY prefixed courses ³		21
Advanced Project		
Select one of the following: ⁴		3
ECE-GY 9953	ADVANCED PROJECT I	

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, upon by the program advisor.

2

Note that ECE-GY 6913 Computing Systems Architecture is a newly developed course that replaces CS-GY 6133 Computer Architecture I as a core course. ECE students interested in computer architecture should take this course instead of CS-GY 6133 Computer Architecture I. CS-GY 6133 Computer Architecture I will be approved as a core course for MS-CE only if it was taken prior to Fall 17.

3

At least 24 out of 30 credits should be ECE-GY prefixed courses including the core courses. The robotics courses listed below count as ECE-GY courses. Up to two non-ECE courses (equivalent to six credits) can be taken from other science, engineering, or management departments at NYU. The total number of credits for 5000-level ECE courses and non-ECE courses cannot exceed 12 credits. Note that CP-GY 9911 Internship for MS I and CP-GY 9921 Internship for MS II can be counted towards the ECE-GY course requirement. Furthermore, credits from 5000-level courses from other departments cannot be counted towards MS/CE degree, except with approval by Program Director.

The following robotics courses count as as ECE-GY prefixed courses:

- 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

Certain courses with a significant project component may be used to satisfy the project requirement, subject to approval by 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 I 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 is required. The total credits for thesis, projects, readings, and internships (see below) should not exceed 9 credits within the 30 credits required for the MS degree.

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
Non-ECE Elective 1		3
Credits		9
3rd Semester/Term		
ECE-GY Elective		3
ECE-GY Elective		3
Non-ECE Elective 2		3
Credits		9
4th Semester/Term		
ECE-GY Elective		3
Credits		3
Total Credits		30

GY 9911 Internship for MS I and CP-GY 9921 Internship for MS II can be counted towards the ECE-GY course requirement. However, if a student has already taken more than 7.5 credits of independent studies, he/she will not be approved for another CP course.

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/>).

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 sub-disciplines of computer engineering, including information technology, computer design and engineering, operating systems and networks, computer architecture, and software applications, among others.

Policies

GPA Policy

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.

Internships

International students must register for an internship course (CP-GY 9911 Internship for MS I, CP-GY 9921 Internship for MS II, 1.5 credit each) to do an internship. Up to 3 credits of approved internships can be applied towards the 30 credits MS degree requirement. International students cannot do internship after they have completed the degree requirement. For an internship to be approved for credits, the internship job must provide industry and/or research experience relevant to the Electrical Engineering degree program. 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 advisor. The student must submit a project report to the faculty advisor 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 within the 30 credits towards the MS degree. Note that CP-