ELECTRICAL AND COMPUTER ENGINEERING (BS)

Department Website (https://engineering.nyu.edu/academics/departments/electrical-and-computer-engineering/)

NYSED: 41026 **HEGIS:** 0909.00 **CIP:** 14.1001

Program Description

Since electrical engineering and computer engineering are both extremely pertinent in today's high technology and global world, this program gives the students the opportunity of garnering knowledge from both fields. The program thus presents the opportunity to take cutting-edge courses in both disciplines such as chip design, wireless, software engineering, bioelectronics, cybersecurity, robotics, power, electronics, and networking. This degree is useful for the student who wants more knowledge in electrical engineering and more depth in computer science.

Students with departmental approval take 134 combined credits in both electrical and computer engineering fields. This program is administered by the Electrical and Computer Engineering Department. Students upon graduation receive one degree in electrical and computer engineering.

Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html).

Program Requirements

The program requires the completion of 134 credits, comprised of the following:

Course	Title	Credits
General Education Requirements		
EXPOS-UA 1	Writing as Inquiry	4
EXPOS-UA 22	Advanced Writing for Engineers	4
Humanities and Social Sciences Electives (four 4-credit courses, for a total of 16 credits) [1]		16
Major Requirements		
MA-UY 1024	Calculus I for Engineers	4
MA-UY 1124	Calculus II for Engineers	4
MA-UY 1044	Linear Algebra	4
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
MA-UY 2314	Discrete Mathematics	4
MA-UY 4204	Ordinary Diff Equations	4
CS-UY 1114	Intro To Programming & Problem Solving [2]	4
CS-UY 1134	Data Structures and Algorithms [2]	4
CS-UY 2124	Object Oriented Programming [2]	4
CS-UY 2214	Computer Architecture and Organization	4
ECE-UY 1002	Introduction to Electrical and Computer Engineering	2
ECE-UY 2004	Fund. Of Electric Circuits [2]	4
ECE-UY 2204	Digital Logic and State Machine Design [2]	4
ECE-UY 2233	Introduction to Probability	3
or MA-UY 2224	Probability and Statistics for Engineers	
ECE-UY 3114	Fundamentals of Electronics I	4
ECE-UY 3054	Signals and Systems [2]	4
ECE-UY 3604	Electromagnetic Waves	4
ECE-UY 4001	ECE Professional Development & Presentation	1
ECE-UY 4144	Introduction to Embedded Systems Design	4
EG-UY 1004	Introduction to Engineering and Design [3]	4
PH-UY 1013	Mechanics	3
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
Design Project		
ECE/CS-UY 4XX3	Design Project I	3
ECE/CS-UY 4XX3	Design Project II	3
Electives		
MA/SCI Elective [4]		3
ECE Elective		3
ECE/CS Electives (two 3-credit courses, for a total of 6 credits)		6
ECE Restricted Elective [5]		4
Free Electives (two 3- to 4-credit courses, for a minimum of 7 credits)		7-8
Total Credits		**134**

[1] Choice of Humanities and Social Sciences courses must conform to university requirements. Students must complete at least ONE Advanced Seminar and one Ethics requirement.

[2] Grade of at least C- required in this course.

[3] For transfer students and students changing major, ECE-UY 1002 Introduction to Electrical and Computer Engineering is not required. EG-UY 1004 Introduction to Engineering and Design may also be excused depending on transfer credits. Missing credit will be substituted with upper level engineering credit.

[4] Students may replace MA-UY 1044 Linear Algebra and MA-UY 4204 Ordinary Diff Equations with MA-UY 2034 Linear Algebra and Differential Equations, in which case an additional MA/SCI elective will be required.

[5] Select one of the following:
- ECE-UY 3064 Feedback Control
- ECE-UY 3124 Fundamentals Of Electronics II
- ECE-UY 3404 Fundamentals of Communication Theory
- ECE-UY 3824 Electric Energy Conversion Systems

Senior Design Project

In the 2-semester Senior Design Project, a required course for seniors, students will focus on an aspect of electrical engineering. In the first semester, they will develop skills using specialized laboratory equipment and computer-design packages. Students will be introduced to techniques for planning projects and how to make effective presentations. They will also learn to balance such design requirements as performance, safety, reliability, and cost effectiveness.

In the final semester, students will design, build, or simulate and test a device or system to meet prescribed engineering specifications. Informal and formal written and public oral presentations will help students prepare for professional careers. Design project students frequently work in groups or pairs to develop interaction skills essential to good engineering.

Senior Thesis

Seniors with a 3.0 GPA or above may register for Senior Thesis in place of the Senior Design Project. Before registering for Senior Thesis, students must arrange for a faculty member to serve as thesis adviser. The thesis must be design oriented. If students opt to complete a Senior Thesis, they do not need to register for either DP-1 or DP-2 but must instead:

- Complete 6 total credits of ECE-UY 397. It is recommended that these credits be taken over the course of 2 semesters;
- Make a presentation to the student's thesis adviser that is open for other students and faculty to attend; and
- Bind the thesis according to the School of Engineering's guidelines for MS and PhD theses.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MA-UY 1024	Calculus I for Engineers	4
EG-UY 1004	Introduction to Engineering and Design	4
CS-UY 1114	Intro To Programming & Problem Solving	4
EXPOS-UA 1	Writing as Inquiry	4
	Credits	**16**
2nd Semester/Term		
MA-UY 1124	Calculus II for Engineers	4
PH-UY 1013	Mechanics	3
ECE-UY 1002	Introduction to Electrical and Computer Engineering	2
CS-UY 1134	Data Structures and Algorithms	4
EXPOS-UA 22	Advanced Writing for Engineers	4
	Credits	**17**
3rd Semester/Term		
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
CS-UY 2124	Object Oriented Programming	4
ECE-UY 2004	Fund. Of Electric Circuits	4
MA-UY 1044	Linear Algebra	4
	Credits	**16**
4th Semester/Term		
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
MA-UY 2314	Discrete Mathematics	4
ECE-UY 2204	Digital Logic and State Machine Design	4
ECE-UY 3114	Fundamentals of Electronics I	4
MA/SCI Elective		3
	Credits	**19**
5th Semester/Term		
CS-UY 2214	Computer Architecture and Organization	4
ECE-UY 3054	Signals and Systems	4
MA-UY 4204	Ordinary Diff Equations	4
ECE-UY 2233 or MA-UY 2224	Introduction to Probability or Probability and Statistics for Engineers	3-4
ECE-UY 4001	ECE Professional Development & Presentation	1
	Credits	**17**
6th Semester/Term		
ECE-UY 3604	Electromagnetic Waves	4
ECE-UY 4144	Introduction to Embedded Systems Design	4
ECE Restricted Elective		4
ECE Restricted Elective		4
	Credits	**16**
7th Semester/Term		
ECE/CS-UY 4XX3	Design Project I	3
ECE Elective		3
ECE Elective		3
Humanities and Social Sciences Elective		4
Humanities and Social Sciences Elective		4
	Credits	**17**
8th Semester/Term		
ECE/CS 4XX3	Design Project II	3
ECE/CS Elective		3
ECE/CS Elective		3
Free Elective		3-4
Free Elective		3-4
	Credits	**16**
	Total Credits	**134**

Learning Outcomes

Upon successful completion of the program, graduates will have:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Policies

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/undergraduate/engineering/academic-policies/).