

ELECTRICAL AND COMPUTER ENGINEERING (BS)

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 The Essay:	4
EXPOS-UA 2	THE ADVANCED COLLEGE ESSAY	4
Humanities and Social Sciences Electives (four 4-credit courses, for a total of 16 credits) ¹		
Major Requirements		
MA-UY 1024	Calculus I for Engineers	4
MA-UY 1124	Calculus II for Engineers	4
MA-UY 3044	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 ⁴	4
CS-UY 1134	Data Structures and Algorithms ⁴	4
CS-UY 2124	Object Oriented Programming ⁴	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	4
ECE-UY 2204	DIGITAL LOGIC AND STATE MACHINE DESIGN ⁴	4
ECE-UY 2233	Introduction to Probability	3
	or MA-UY 2224 Data Analysis	
ECE-UY 3114	Fundamentals of Electronics I	4

ECE-UY 3054	Signals and Systems ⁴	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 ²	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 6 credits)	6-8

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

Students may replace MA-UY 3044 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.

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

Grade of at least C- required in this course.

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, you will focus on an aspect of electrical engineering. In the first semester, you will develop skills using specialized laboratory equipment and computer-design packages. You will be introduced to techniques for planning projects and how to make effective presentations. You will also learn to balance such design requirements as performance, safety, reliability, and cost effectiveness.

In the final semester, you 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 you 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. The thesis must be design oriented. If you opt to complete a Senior Thesis, you do not need to register for either DP-1 or DP-2 but must instead:

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

Before registering for Senior Thesis, you must arrange for a faculty member to serve as thesis adviser. Students in the Honors Program must complete a Senior Thesis, unless they have completed a MS thesis as part of their participation in the BS/MS Program. In such cases, the MS Thesis fulfills the requirement instead.

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 The Essay:	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 2	THE ADVANCED COLLEGE ESSAY	4
Credits		17
3rd Semester/Term		
MA-UY 3044	Linear Algebra ³	4
PH-UY 2023	ELECTRICITY, MAGNETISM, & FLUIDS	4
PH-UY 2121	General Physics Laboratory I	1
CS-UY 2124	Object Oriented Programming	4
ECE-UY 2004	FUND. OF ELECTRIC CIRCUITS	4
Credits		17
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 ²	4
MA-UY 4204	Ordinary Diff Equations	4
ECE-UY 2233 or MA-UY 2224	Introduction to Probability or Data Analysis	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		4
ECE Restricted Elective		4
Credits		16

7th Semester/Term

ECE/CS-UY 4XX3	Design Project I	3
ECE Elective ⁶		3
ECE Elective		3
Humanities and Social Sciences Elective ⁵		4
Humanities and Social Sciences Elective		4
Credits		17

8th Semester/Term

ECE/CS 4XX3	Design Project II	3
ECE/CS Elective ⁶		3
ECE/CS Elective		3
Free Elective ⁷		3-4
Free Elective		3-4
Credits		15
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/>).