COMPUTER ENGINEERING (BS)

Department Website (https://engineering.nyu.edu/academics/programs/computer-engineering-bs/)

NYSED: 90109 **HEGIS:** 0909.00 **CIP:** 14.0901

Program Description

Products of computer engineering touch nearly every part of our lives. They let us chat via webcams, send e-mails from cell phones, and withdraw cash from ATMs. But computer-based devices and information networks aren't the only products computer engineers develop; they reconstruct genomes, design robots, and develop software to make businesses more efficient. That's just the kind of invention, innovation, and entrepreneurship that the School of Engineering encourages.

Our BS program in Computer Engineering is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org/). The program has a comprehensive analysis and design curriculum that provides an outstanding, cutting-edge education in computer systems with emphasis on hardware and software, The program incorporates the latest market and technology trends and combines the traditional disciplines of electronics, communications, control and computer programming with newer courses, such as Cyber Security, Nanoscale Circuit Design, Parallel Computers, Image Processing, Biomedical Instrumentation, Web Search Engines, Wireless Networks, Peer-to-Peer Networks, SoC (System-on-a-Chip), VLSI (Very Large Scale Integration) and Game Development.

Recognizing the need for well-rounded engineers, we also emphasize strong communication and interpersonal skills. Our students develop these skills not only through required courses in the humanities and social sciences but also during team projects in design classes. Sponsored research and affiliate programs at our Center for Advanced Technology in Telecommunications (CATT) (http://catt.nyu.edu/), and Offensive Security, Incident Response, and Internet Security Lab (https://www.osiris.cyber.nyu.edu/) also put you in constant contact with alumni and instructors whose experience in the industry you can draw upon.

Graduates of our program have gone on to design microchips and computer graphics, monitor and control industrial plants, and develop embedded hardware/software systems. They also occupy positions in manufacturing, research, financial services, health, and government, or create their own companies.

With departmental permission, you may earn a single bachelor's degree in electrical and computer engineering. This degree requires a minimum of 142 credits rather than the typical 128 required for individual bachelor's degrees.

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 128 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)		16
Major Requirements		
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
MA-UY 1124	Calculus II for Engineers	4
PH-UY 1013	MECHANICS	3
CS-UY 1134	Data Structures and Algorithms	4
MA-UY 2034	Linear Algebra and Differential Equations	4
ECE-UY 1002	INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING	2
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 2314	Discrete Mathematics	4
ECE-UY 3114	Fundamentals of Electronics I	4
ECE-UY 2204	DIGITAL LOGIC AND STATE MACHINE DESIGN	4
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
CS-UY 2214	COMPUTER ARCHITECTURE AND ORGANIZATION	4
ECE-UY 4001	ECE Professional Development & Presentation	1
MA-UY 2224	Data Analysis	4
ECE-UY 4144	Introduction to Embedded Systems Design	4
Design Project		
ECE/CS 4XX3	Design Project I	3
ECE-CS 4XX3	Design Project II	3
Electives		
Free Electives		15
Math/Science Electives (two 3-credit courses, for a total of 6 credits)		6
ECE/CS Electives (two 3- to 4-credit courses, for a minimum of 6 credits)		6-8
Total Credits		**128**

Program Notes

1. 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 upon transfer credits.

2. Grades of at least C- are required in CS-UY 1114 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=11&poid=3569&returnto=990#tt7782), CS-UY 1134 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=11&poid=3569&returnto=990#tt9036), CS-UY 2124 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=11&poid=3569&returnto=990#tt5177), CS-UY 2204

(http://bulletin.engineering.nyu.edu/preview_program.php?catoid=11&poid=3569&returnto=990#tt2994), and ECE-UY 2004 (http://bulletin.engineering.nyu.edu/preview_program.php?catoid=11&poid=3569&returnto=990#tt7531). C if repeated twice.

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

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MA-UY 1024	Calculus I for Engineers	4
CS-UY 1114	INTRO TO PROGRAMMING & PROBLEM SOLVING [1]	4
EG-UY 1004	Introduction to Engineering and Design [2]	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
CS-UY 1134	Data Structures and Algorithms [1]	4
ECE-UY 1002	INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING [3]	2
EXPOS-UA 2	THE ADVANCED COLLEGE ESSAY	4
	Credits	**17**
3rd Semester/Term		
MA-UY 2034	Linear Algebra and Differential Equations [2]	4
PH-UY 2023	ELECTRICITY, MAGNETISM, & FLUIDS	3
PH-UY 2121	General Physics Laboratory I	1
CS-UY 2124	Object Oriented Programming [1]	4
ECE-UY 2004	FUND. OF ELECTRIC CIRCUITS [1]	4
	Credits	**16**
4th Semester/Term		
MA-UY 2314	Discrete Mathematics	4
Math/Science Elective		3
ECE-UY 2204	DIGITAL LOGIC AND STATE MACHINE DESIGN [1]	4
ECE-UY 3114	Fundamentals of Electronics I	4
	Credits	**15**
5th Semester/Term		
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
Math/Science Elective		3
CS-UY 2214	COMPUTER ARCHITECTURE AND ORGANIZATION	4
ECE/CS Elective [4]		3-4
ECE-UY 4001	ECE Professional Development & Presentation	1
	Credits	**15**
6th Semester/Term		
MA-UY 2224	Data Analysis	4
ECE-UY 4144	Introduction to Embedded Systems Design	4
Humanities and Social Sciences Elective Course [5]		4
Free Elective [6]		3-4
	Credits	**15**
7th Semester/Term		
ECE/CS 4XX3	Design Project	3
ECE/CS Elective [4]		3-4
Humanities and Social Sciences Elective Course [5]		4
Free Elective [6]		3-4
Free Elective [6]		3-4
	Credits	**16**
8th Semester/Term		
ECE/CS 4XX3	Design Project II	3
Humanities and Social Sciences Elective Course [5]		4
Humanities and Social Sciences Elective Course [5]		4
Free Elective [6]		3-4
Free Elective [6]		3-4
	Credits	**18**
	Total Credits	**128**

1

Grades of at least C- is required in CS-UY 1114 INTRO TO PROGRAMMING & PROBLEM SOLVING, CS-UY 1134 Data Structures and Algorithms, CS-UY 2124 Object Oriented Programming, ECE-UY 2204 DIGITAL LOGIC AND STATE MACHINE DESIGN, and ECE-UY 2004 FUND. OF ELECTRIC CIRCUITS.

2

Students may replace MA-UY 2034 Linear Algebra and Differential Equations with MA-UY 3044 Linear Algebra and MA-UY 4204 Ordinary Diff Equations, in which case one of these classes will be used as a MA/SCI elective.

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 upon transfer credits. Missing credit will be substituted with upper level engineering credit.

4

ECE/CS electives can be chosen from any ECE-UY or CS-UY prefixed course not already required by the major. The following ROB-UY courses count as ECE Electives:

- ROB-UY 2004 ROBOTIC MANIPULATION AND LOCOMOTION
- ROB-UY 3203 ROBOT VISION
- ROB-UY 3303 ROBOT MOTION AND PLANNING
- ROB-UY 3404 INTRODUCTION TO HAPTICS AND TELEROBOTICS IN MEDICINE

5

Choice of Humanities and Social Sciences courses must conform to university requirements. Students must complete at least **one** Advanced Seminar and one Ethics Requirements.

6

Students may take up to 15 credits of free electives to count towards their degree.

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
GPA Policy

A GPA (Technical) of at least 2.0 is required in all ECE-UY, CS-UY and ECE-GY courses.

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/).