

# COMPUTER ENGINEERING (BS)

CIP: 14.0901

## Program Description

NYU Abu Dhabi's Computer Engineering program prepares graduates to apply knowledge of discrete mathematics, differential calculus, integral calculus, probability and statistics, sciences, computer science, and engineering topics necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

Computer Engineering majors study:

- machine architecture and logic design
- robotics
- multimedia
- computer networks
- operating systems
- database systems
- programming systems and languages
- digital devices and circuits

NYU Abu Dhabi offers six engineering degree programs: General Engineering, Bioengineering, Civil Engineering, Computer Engineering, Electrical Engineering, and Mechanical Engineering.

Each program is designed to create technological leaders with a global perspective, a broad education, and the capacity to think creatively. The uniqueness of the program lies in the integration of invention, innovation, and entrepreneurship into all phases of study. Students enjoy a learning environment conducive to creativity, which is at the heart of tomorrow's technological innovations and enterprises.

The Computer Engineering program at NYU Abu Dhabi is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org> (<https://www.abet.org/>), and the Commission for Academic Accreditation (CAA). Graduates receive a Bachelor of Science degree.

## 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 \(https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html\)](https://www.nyu.edu/admissions/undergraduate-admissions/how-to-apply.html).

## Program Requirements

Course	Title	Credits
<b>General Education Requirements</b>		
Colloquia		8
First-Year Seminar		4
Arts, Design, and Technology		4
Cultural Exploration Analysis		4
Data and Discovery		4
Structures of Thought and Society		4
January Term Courses (3 courses)		12

### Science Courses

SCIEN-UH 1101:1104	Foundations of Science 1: Energy & Matter	4
SCIEN-UH 1201:1204		4
PHYS-UH 2115 or ENGR-UH 3130	Electricity and Magnetism for Engineers Quantitative Synthetic Biology	4

### Mathematics Courses

MATH-UH 1012Q	Calculus with Applications to Science and Engineering	4
MATH-UH 1020	Multivariable Calculus with Applications to Science and Engineering	4
MATH-UH 1022	Linear Algebra	4
MATH-UH 1024	Fundamentals of Ordinary Differential Equations	2
CS-UH 1002	Discrete Mathematics	4
ENGR-UH 2010Q	Probability and Statistics for Engineers	2

### Engineering Common Courses

ENGR-UH 1000	Computer Programming for Engineers	4
ENGR-UH 1010	Engineering Ethics	1
ENGR-UH 1021J	Design and Innovation	2
ENGR-UH 2011	Engineering Statics	2
ENGR-UH 2012	Conservation Laws in Engineering	2
ENGR-UH 2013	Digital Logic	2
ENGR-UH 2017	Numerical Methods	2
ENGR-UH 2019	Circuits Fundamentals	2

### Computer Engineering Required Courses

ENGR-UH 2310	Advanced Digital Logic	2
ENGR-UH 2311	Advanced Circuits	2
ENGR-UH 2510	Object-Oriented Programming	2
ENGR-UH 3510	Data Structures and Algorithms	4
ENGR-UH 3511	Computer Organization and Architecture	4
ENGR-UH 3512	Computer Networks	4
ENGR-UH 3520	Operating Systems	4
ENGR-UH 3530	Embedded Systems	4

### Computer Engineering Elective Courses

Select 14 credits from the following list of courses, including at least 14 one hardware elective course:

ENGR-UH 2610	Fundamentals of Complex Variables	
ENGR-UH 2812	Bioimaging	
ENGR-UH 3110	Instrumentation, Sensors, Actuators <sup>1</sup>	
ENGR-UH 3331	Computer Vision	
ENGR-UH 3332	Applied Machine Learning	
ENGR-UH 3610	Signals and Systems	
ENGR-UH 3611	Electronics <sup>1</sup>	
ENGR-UH 4112	Engineering Honors Research	

ENGR-UH 4142	Bio-sensors and Biochips <sup>1</sup>	
ENGR-UH 4230	Applied Optimization	
ENGR-UH 4320	Hardware Security <sup>1</sup>	
ENGR-UH 4330	Robotics	
ENGR-UH 4560	Selected Topics in Information and Computational Systems	
ENGR-UH 4660	Selected Topics in Communication and Electronic Systems	
ENGR-UH 4701	Electrochemical Energy Devices	
CS-UH 2012	Software Engineering	
CS-UH 2214	Database Systems	
CS-UH 2220	Machine Learning	
IM-UH 2310		
MUSIC-UH 2419	Computational Approaches to Music and Audio I	
<b>Capstone</b>		
ENGR-UH 4011	Senior Design Capstone Project I	2
ENGR-UH 4020	Senior Design Capstone Project II	4
Other Elective Credits		5
<b>Total Credits</b>		<b>140</b>

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Course qualifies as a Computer Engineering hardware elective course.

## Sample Plan of Study

Course	Title	Credits
<b>1st Semester</b>		
MATH-UH 1012	Calculus with Applications to Science and Engineering	4
	First-Year Writing Seminar	4
	General Elective	4
ENGR-UH 1000	Computer Programming for Engineers	4
<b>Credits</b>		<b>16</b>
<b>2nd Semester</b>		
ENGR-UH 1021J	Design and Innovation	4
<b>Credits</b>		<b>4</b>
<b>3rd Semester</b>		
MATH-UH 1020	Multivariable Calculus with Applications to Science and Engineering	4
	Colloquium	4
<b>Credits</b>		<b>8</b>
<b>4th Semester</b>		
MATH-UH 1023	Linear Algebra for Engineers	4
	Core	4
MATH-UH 1024	Fundamentals of Ordinary Differential Equations	4
<b>Credits</b>		<b>12</b>
<b>5th Semester</b>		
	General Elective	4
<b>Credits</b>		<b>4</b>
<b>6th Semester</b>		
ENGR-UH 2510	Computer Systems Programming	4
	Core	4
ENGR-UH 2311	Advanced Circuits	4
ENGR-UH 2019	Circuits Fundamentals	4

ENGR-UH 2310	Advanced Digital Logic	4
ENGR-UH 2013	Digital Logic	4
ENGR-UH 2025	Fundamentals of Discrete Math	4
<b>Credits</b>		<b>28</b>
<b>7th Semester</b>		
ENGR-UH 3511	Computer Organization and Architecture	4
	Colloquium	4
	"ENGR-UH 3510 Data Structures, Algorithm Design and Analysis"	4
ENGR-UH 2017	Simulation and Computational Methods	4
ENGR-UH 2010	Probability and Statistics for Engineers	4
<b>Credits</b>		<b>20</b>
<b>8th Semester</b>		
	General Elective	4
<b>Credits</b>		<b>4</b>
<b>9th Semester</b>		
ENGR-UH 3520	Operating Systems	4
	General Elective	4
	HARDWARE	NA
ENGR-UH 3512	Computer Networks	4
<b>Credits</b>		<b>12</b>
<b>10th Semester</b>		
ENGR-UH 4010	Senior Capstone Seminar	4
	Core	4
ENGR-UH 3530	Embedded Systems	4
	Computer Engineering Elective	4
ENGR-UH 4011	Senior Design Capstone Project I	4
<b>Credits</b>		<b>20</b>
<b>11th Semester</b>		
ENGR-UH 4020	Senior Design Capstone Project II	4
	Core	4
	Computer Engineering Elective	4
ENGR-UH 2011	Mechanics/Engineering Statics	4
ENGR-UH 2012	Laws of Conservation/Engineering Conservation Laws	4
<b>Credits</b>		<b>20</b>
<b>Total Credits</b>		<b>148</b>

## Learning Outcomes

Upon graduation, NYU Abu Dhabi Computer Engineering students will possess:

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/>).

### **NYU Abu Dhabi Policies**

A full list of relevant policies can be found on NYU Abu Dhabi's undergraduate academic policies page (<https://bulletins.nyu.edu/undergraduate/abu-dhabi/academic-policies/>).