

# ELECTRICAL ENGINEERING (BS)

CIP: 14.1001

## Program Description

Electrical Engineering at NYU Abu Dhabi prepares graduates to apply knowledge of advanced mathematics, such as differential and integral calculus, linear algebra, complex variables and discrete mathematics, probability and statistics, sciences, and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

Electrical Engineering majors study:

- integrated circuits
- fabrication technology
- solid state devices
- digital and analog circuits analysis and design
- VLSI design
- computer-aided design and manufacturing
- embedded systems
- micro-electro-mechanical systems
- digital and analog communications
- signal processing
- systems design and optimization

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.

## Accreditation

The Electrical 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.

## Study Away

The study away pathway can be found on the NYUAD Student Portal at [students.nyuad.nyu.edu/pathways](https://students.nyuad.nyu.edu/pathways) (<https://bulletins.nyu.edu/undergraduate/abu-dhabi/programs/electrical-engineering-bs/students.nyuad.nyu.edu/pathways/>). Students with questions should contact the Office of Global Education.

## 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

Course	Title	Credits
<b>General Education Requirements</b>		
Physical Education (2 courses)		
Quantitative Reasoning (1 course)		
Experimental Inquiry (1 course)		
Islamic Studies (1 course)		
First-Year Writing Seminar		4
Colloquia		4
Field Colloquia (2 J-Term courses)		6
<i>Core Competencies</i>		
Arts, Design, and Technology		4
Cultural Exploration Analysis		4
Data and Discovery		4
Structures of Thought and Society		4
<b>Major Requirements</b>		
<i>Science Courses (12 credits)</i>		
SCIEN-UH 1121EQ	Foundations of Science 1-2: Physics	1.5
SCIEN-UH 1122EQ	Foundations of Science 1-2: Chemistry	3
SCIEN-UH 1123EQ	Foundations of Science 1-2: Biology	1.5
SCIEN-UH 1124C	Foundations of Science 2 Lab: Chemistry	1
SCIEN-UH 1124P	Foundations of Science 1 Lab: Physics	1
PHYS-UH 2115	Electricity and Magnetism for Engineers	4
<i>Mathematics Courses (22 credits)</i>		
MATH-UH 1012Q	Calculus with Applications to Science and Engineering	4
MATH-UH 1020Q	Multivariable Calculus with Applications to Science and Engineering	4
MATH-UH 1022Q	Linear Algebra	4
MATH-UH 2010Q	Ordinary Differential Equations	4
or ENGR-UH 2710	Differential Equations for Engineers	
MATH-UH 3610	Complex Analysis	4
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
<i>Engineering Common Courses (17 credits)</i>		
ENGR-UH 1000	Computer Programming for Engineers	4
ENGR-UH 1010	Engineering Ethics	1
ENGR-UH 1021	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
<i>Electrical Engineering Required Courses (22 credits)</i>		
ENGR-UH 2311	Advanced Circuits	2
ENGR-UH 3610	Signals and Systems	4
ENGR-UH 3611	Electronics	4

ENGR-UH 3620	Analog and Digital Communication Theory	4
ENGR-UH 4610	Control Systems Engineering	4
ENGR-UH 3613	Electromagnetics	4
or PHYS-UH 3011	Electricity and Magnetism	
<i>Electrical Engineering Electives (15 credits)</i>		
Complete at least 15 credits of Electrical Engineering electives (see list below)		15
<i>Capstone (6 credits)</i>		
ENGR-UH 4011	Senior Design Capstone Project I	2
ENGR-UH 4020	Senior Design Capstone Project II	4
<b>Other Electives</b>		
Complete enough courses to reach the minimum overall required 128 credits		4
<b>Total Credits</b>		<b>128</b>

Electrical Engineering Electives

Course	Title	Credits
CS-UH 1050	Data Structures	4
CS-UH 1052	Algorithms	4
CS-UH 2010	Computer Systems Organization	4
CS-UH 2220	Machine Learning	4
CS-UH 3012	Computer Networks	4
CS-UH 3211	Quantum Computing	4
ENGR-UH 1801	Bioengineering Principles	2
ENGR-UH 2510	Object-Oriented Programming	4
ENGR-UH 2812	Bioimaging	2
ENGR-UH 3331	Computer Vision	2
ENGR-UH 3332	Applied Machine Learning	4
ENGR-UH 3510	Data Structures and Algorithms	4
ENGR-UH 3511	Computer Organization and Architecture	4
ENGR-UH 3512	Computer Networks	4
ENGR-UH 3530	Embedded Systems	4
ENGR-UH 4112	Engineering Honors Research	2
ENGR-UH 4141	Fundamentals and Applications of MEMS	4
ENGR-UH 4142	Bio-sensors and Biochips	4
ENGR-UH 4143	Computer Vision and Pattern Recognition	4
ENGR-UH 4230	Applied Optimization	4
ENGR-UH 4320	Hardware Security	4
ENGR-UH 4560	Selected Topics in Information and Computational Systems	2-4
ENGR-UH 4620	Fundamentals of Photonics-I	2
ENGR-UH 4621	Wireless Communications	3
ENGR-UH 4701	Electrochemical Energy Devices	2
MUSIC-UH 2419	Computational Approaches to Music and Audio I	4
MUSIC-UH 3417	Computational Approaches to Music and Audio II	4
PHYS-UH 3220	Imaging and Spectroscopy Lab	2

Sample Plan of Study

Course	Title	Credits
<b>1st Semester/Term</b>		
First-Year Writing Seminar		4
MATH-UH 1012Q	Calculus with Applications to Science and Engineering	4
ENGR-UH 1000	Computer Programming for Engineers	4

Core Competency		4
Physical Education		
<b>Credits</b>		<b>16</b>
<b>2nd Semester/Term</b>		
ENGR-UH 1021	Design and Innovation	2
<b>Credits</b>		<b>2</b>
<b>3rd Semester/Term</b>		
MATH-UH 1020Q	Multivariable Calculus with Applications to Science and Engineering	4
SCIEN-UH 1121EQ	Foundations of Science 1-2: Physics	1.5
SCIEN-UH 1122EQ	Foundations of Science 1-2: Chemistry	3
SCIEN-UH 1123EQ	Foundations of Science 1-2: Biology	1.5
SCIEN-UH 1124C	Foundations of Science 2 Lab: Chemistry	1
SCIEN-UH 1124P	Foundations of Science 1 Lab: Physics	1
Colloquia		4
<b>Credits</b>		<b>16</b>
<b>4th Semester/Term</b>		
MATH-UH 1022Q	Linear Algebra	4
ENGR-UH 2011	Engineering Statics	2
ENGR-UH 2012	Conservation Laws in Engineering	2
ENGR-UH 2013	Digital Logic	2
ENGR-UH 2019	Circuits Fundamentals	2
Core Competency		4
Physical Education		
<b>Credits</b>		<b>16</b>
<b>5th Semester/Term</b>		
Field Colloquia (J-Term)		3
<b>Credits</b>		<b>3</b>
<b>6th Semester/Term</b>		
ENGR-UH 1010	Engineering Ethics	1
ENGR-UH 2311	Advanced Circuits	2
MATH-UH 2010Q or ENGR-UH 2710	Ordinary Differential Equations or Differential Equations for Engineers	4
MATH-UH 3610	Complex Analysis	4
Core Competency		4
<b>Credits</b>		<b>15</b>
<b>7th Semester/Term</b>		
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
ENGR-UH 3610	Signals and Systems	4
ENGR-UH 3611	Electronics	4
PHYS-UH 2115	Electricity and Magnetism for Engineers	4
<b>Credits</b>		<b>14</b>
<b>8th Semester/Term</b>		
Field Colloquia (J-Term)		3
<b>Credits</b>		<b>3</b>
<b>9th Semester/Term</b>		
ENGR-UH 3613	Electromagnetics	4
Major Elective		3
Major Elective		3
Major Elective		3
Major Elective		3
<b>Credits</b>		<b>16</b>
<b>10th Semester/Term</b>		
ENGR-UH 4011	Senior Design Capstone Project I	2
ENGR-UH 2017	Numerical Methods	2
ENGR-UH 3620	Analog and Digital Communication Theory	4
ENGR-UH 4610	Control Systems Engineering	4
Major Elective		3
<b>Credits</b>		<b>15</b>
<b>11th Semester/Term</b>		
ENGR-UH 4020	Senior Design Capstone Project II	4
Core Competency		4

General Elective	4
Credits	12
Total Credits	128

## NYU Policies

University-wide policies can be found on the New York University Policy pages (<https://bulletins.nyu.edu/nyu/policies/>).

## Learning Outcomes

Upon graduation, NYU Abu Dhabi Electrical 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

### Program Policies

#### Foundations of Science Grading Policy

While each level of Foundations of Science is an integrated course, separate grades are provided for various components as a means to allow students to document their completion of the specific disciplinary and laboratory content that makes up these courses. Consistent with this integrated approach, students must earn an average grade of C for the components of each level of Foundations of Science to continue into the next level or to use the course to satisfy the prerequisites for other courses outside of Foundations of Science. Additionally, students majoring in biology, chemistry, or physics, must have grades of at least C in all Foundations of Science components in their specific, respective major fields. Finally, although continuation into other courses is based on the average performance in each level of Foundations of Science, students earn academic credits only for those graded components they pass or, for students subject to the transcript policy (see Academic Policies), only for those components with grades of at least C-. The number of earned credits for Foundations of Science components is particularly important for all engineering majors who must earn at least 16 credits in science.

### 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/>).