

# GENERAL ENGINEERING (BS)

CIP: 14.0101

## Program Description

The General Engineering program allows students to approach engineering in an integrated manner that cuts across traditional boundaries of the profession and practice. The program provides a balance between breadth across the traditional engineering disciplines and depth in a thematic multi-disciplinary area.

The thematic areas currently emphasized correspond to research themes within the division:

- Cyber Security
- Robotics
- Urban Systems
- Environmental Sustainability
- BioMedical and Health Systems

Students are encouraged to choose a specialization in one of the thematic areas. The engineering courses in the program related to the specialization consist of some required courses that explore the broad interdisciplinary basis of the area, followed by electives that provide depth in an aspect of the specialization.

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 General 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/general-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
<b>Core Competencies</b>		
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 (20 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	
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
Complete at least 2 credits from the following:		2
CS-UH 1002	Discrete Mathematics	
ENGR-UH 2027	Introduction to Data Analysis for Engineers	
<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>Major Electives (39 credits)</i>		
Complete at least 39 credits of Engineering electives (see list below)		39
<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>

## Engineering Electives

Code	Title	Credits
CS-UH 2010	Computer Systems Organization	4
CS-UH 2010G	Computer Systems Organization	4
CS-UH 2220	Machine Learning	4
CS-UH 3211	Quantum Computing	4
ENGR-UH 1801	Bioengineering Principles	2
ENGR-UH 2028	Tissue Engineering	2
ENGR-UH 2112	Engineers for Social Impact	2
ENGR-UH 2113	Introduction to Manufacturing Processes	2
ENGR-UH 2210	Engineering Dynamics	3
ENGR-UH 2211	Solid Mechanics	2
ENGR-UH 2212	Fluid Mechanics	3
ENGR-UH 2310	Advanced Digital Logic	2
ENGR-UH 2311	Advanced Circuits	2
ENGR-UH 2510	Object-Oriented Programming	4
ENGR-UH 2610	Fundamentals of Complex Variables	2
ENGR-UH 2810	Biomechanics	2
ENGR-UH 2811	Biotransport Phenomena	2
ENGR-UH 2812	Bioimaging	2
ENGR-UH 3111	Analysis of Chemical and Biological Processes	4
ENGR-UH 3210	Advanced Solid Mechanics	2
ENGR-UH 3230	Finite Element Modeling and Analysis	4
ENGR-UH 3331	Computer Vision	2
ENGR-UH 3332	Applied Machine Learning	4
ENGR-UH 3410	Structural Systems	2
ENGR-UH 3411	Environmental Engineering	4
ENGR-UH 3412	Geotechnical Engineering	4
ENGR-UH 3413	Transportation and Traffic Engineering	4
ENGR-UH 3420	Project Management	2
ENGR-UH 3430	Steel Structures Design	2
ENGR-UH 3431	Concrete Structures Design	2
ENGR-UH 3432	Water and Wastewater Systems Design	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
ENGR-UH 3610	Signals and Systems	4
ENGR-UH 3611	Electronics	4
ENGR-UH 3613	Electromagnetics	4
ENGR-UH 3620	Analog and Digital Communication Theory	4
ENGR-UH 3710	Thermodynamics	3
ENGR-UH 3720	Computer-Aided Design	2
ENGR-UH 3730	Modeling and Analysis of Dynamical Systems	3
ENGR-UH 3751	Heat Transport	3

ENGR-UH 3810	Quantitative Physiology	2
ENGR-UH 3813	Nanobiotechnology	2
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 4160	Selected Topics in Biomedical and Health Systems	2-4
ENGR-UH 4230	Applied Optimization	4
ENGR-UH 4320	Hardware Security	4
ENGR-UH 4330	Robotics	4
ENGR-UH 4423	Production and Logistics Management	4
ENGR-UH 4424	Information Management and Modeling for Construction	2
ENGR-UH 4431	Foundation Engineering Design	2
ENGR-UH 4433	Structure and Properties of Civil Engineering Materials	2
ENGR-UH 4434	Water Desalination Engineering	2
ENGR-UH 4436	Computer Assisted Design for Civil Engineers	2
ENGR-UH 4460	Selected Topics in Urban Systems	2-4
ENGR-UH 4560	Selected Topics in Information and Computational Systems	2-4
ENGR-UH 4610	Control Systems Engineering	4
ENGR-UH 4620	Fundamentals of Photonics-I	2
ENGR-UH 4701	Electrochemical Energy Devices	2
ENGR-UH 4710	Thermal Systems	2
ENGR-UH 4712	Mechanics of Composite Materials	2
ENGR-UH 4760	Selected Topics in Mechanical Engineering	4
ENGR-UH 4810	Biomaterials	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
ENGR-UH 1010	Engineering Ethics	1
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>17</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>		
MATH-UH 2010Q or ENGR-UH 2710	Ordinary Differential Equations or Differential Equations for Engineers	4
PHYS-UH 2115	Electricity and Magnetism for Engineers	4
Major Elective		4
General Elective		4
<b>Credits</b>		<b>16</b>
<b>7th Semester/Term</b>		
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
ENGR-UH 2017	Numerical Methods	2
Major Elective		4
Major Elective		4
Core Competency		4
<b>Credits</b>		<b>16</b>
<b>8th Semester/Term</b>		
Field Colloquia (J-Term)		3
<b>Credits</b>		<b>3</b>
<b>9th Semester/Term</b>		
Major Elective		4
Major Elective		4
Major Elective		4
Major Elective		3
<b>Credits</b>		<b>15</b>
<b>10th Semester/Term</b>		
ENGR-UH 4011	Senior Design Capstone Project I	2
ENGR-UH 2027 or CS-UH 1002	Introduction to Data Analysis for Engineers or Discrete Mathematics	2
Major Elective		4
Core Competency		4
<b>Credits</b>		<b>12</b>
<b>11th Semester/Term</b>		
ENGR-UH 4020	Senior Design Capstone Project II	4
Major Elective		4
Major Elective		4
<b>Credits</b>		<b>12</b>
<b>Total Credits</b>		<b>128</b>

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/>).

### 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 General 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