

MECHANICAL ENGINEERING (BS)

CIP: 14.1901

Program Description

Mechanical Engineering at NYU Abu Dhabi focuses on the use of mechanical and thermal energy to design and produce devices for the improvement of human life. Applications of mechanical engineering principles are wide and varied: aircraft design, biomechanics, control of satellite orbits, manufacturing, robotics, robot-aided medical procedures, automotive systems, jet engines, construction equipment, heating/cooling systems, just to name a few.

The field of mechanical engineering involves the study of mechanics, kinematics, thermodynamics, material science, computer-aided design, and computational methods among other topics. A solid basis in mathematics is essential in this major, along with a strong background in the basic sciences: physics, chemistry, and biology.

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 Mechanical Engineering program at NYU Abu Dhabi is accredited by the Engineering Accreditation Commission of ABET, (<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>).

Program Requirements

Course	Title	Credits
General Education Requirements		
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	Electricity and Magnetism for Engineers	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 2010	Ordinary Differential Equations	4
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
ENGR-UH 2026	Partial Differential Equations 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

Mechanical Engineering Required Courses

ENGR-UH 2210	Engineering Dynamics	2
ENGR-UH 2211	Solid Mechanics	2
ENGR-UH 2212	Fluid Mechanics	2
ENGR-UH 3110	Instrumentation, Sensors, Actuators	4
ENGR-UH 3120	Engineering Materials	2
ENGR-UH 3210	Advanced Solid Mechanics	2
ENGR-UH 3710	Thermodynamics	2
ENGR-UH 3720	Computer-Aided Design	2
ENGR-UH 3730	Modeling and Analysis of Dynamical Systems	4
ENGR-UH 3751	Heat Transport	2
ENGR-UH 4710	Thermal Systems	2

Mechanical Engineering Elective Courses

Select 14 credits from the following list of courses:		14
ENGR-UH 2028	Tissue Engineering	
ENGR-UH 2113	Introduction to Manufacturing Processes	
ENGR-UH 2610	Fundamentals of Complex Variables	
ENGR-UH 2810	Biomechanics	
ENGR-UH 2811	Biotransport Phenomena	
ENGR-UH 3111	Analysis of Chemical and Biological Processes	
ENGR-UH 3230	Finite Element Modeling and Analysis	
ENGR-UH 3332	Applied Machine Learning	
ENGR-UH 3410	Structural Systems	

ENGR-UH 3411	Environmental Engineering	
ENGR-UH 3420	Project Management	
ENGR-UH 3810	Quantitative Physiology	
ENGR-UH 4112	Engineering Honors Research	
ENGR-UH 4141	Fundamentals and Applications of MEMS	
ENGR-UH 4142	Bio-sensors and Biochips	
ENGR-UH 4230	Applied Optimization	
ENGR-UH 4330	Robotics	
ENGR-UH 4423	Production and Logistics Management	
ENGR-UH 4560	Selected Topics in Information and Computational Systems	
ENGR-UH 4610	Control Systems Engineering	
ENGR-UH 4701	Electrochemical Energy Devices	
ENGR-UH 4711	Compressible Flow	
ENGR-UH 4712	Mechanics of Composite Materials	
ENGR-UH 4760	Selected Topics in Mechanical Engineering	
ENGR-UH 4770	Micro-power Generation	
ENGR-UH 4810	Biomaterials	
CS-UH 2220	Machine Learning	

Capstone

ENGR-UH 4011	Senior Design Capstone Project I	2
ENGR-UH 4020	Senior Design Capstone Project II	4
Other Elective Credits		5

Total Credits 140

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MATH-UH 1012		4
First-Year Writing Seminar		4
General Elective		4
ENGR-UH 1000	Computer Programming for Engineers	4
Credits		16
2nd Semester/Term		
ENGR-UH 1021J	Design and Innovation	4
Credits		4
3rd Semester/Term		
MATH-UH 1020	Multivariable Calculus with Applications to Science and Engineering	4
Colloquium		4
Credits		8

4th Semester/Term		
MATH-UH 1023	Fundamentals of Linear Algebra	4
Core		4
MATH-UH 1024	Fundamentals of Ordinary Differential Equations	4
Credits		12

5th Semester/Term		
General Elective		4
Credits		4

6th Semester/Term		
ENGR-UH 2019	Circuits Fundamentals	4
Core		4
ENGR-UH 2212	Fluid Mechanics	4
ENGR-UH 2012	Conservation Laws in Engineering	4
ENGR-UH 2210	Engineering Dynamics	4
ENGR-UH 2011	Engineering Statics	4
ENGR-UH 2211	Solid Mechanics	4
Credits		28

7th Semester/Term		
ENGR-UH 3710	Thermodynamics	4
Colloquium		4
ENGR-UH 3713		4
ENGR-UH 3210	Advanced Solid Mechanics	4
ENGR-UH 2017	Numerical Methods	4
ENGR-UH 2010		4
ENGR-UH 3751	Heat Transport	4
Credits		28

8th Semester/Term		
General Elective		4
Credits		4

9th Semester/Term		
ENGR-UH 3120	Engineering Materials	4
General Elective		4
Mechanical Engineering Elective		4
Mechanical Engineering Elective		4
ENGR-UH 3720	Computer-Aided Design	4
Credits		20

10th Semester/Term		
ENGR-UH 4010		4
Core		4
Mechanical Engineering Elective		4
ENGR-UH 3110	Instrumentation, Sensors, Actuators	4
ENGR-UH 4011	Senior Design Capstone Project I	4
Credits		20

11th Semester/Term		
ENGR-UH 4020	Senior Design Capstone Project II	4
Core		4
ENGR-UH 4710	Thermal Systems	4
ENGR-UH 2025	Fundamentals of Discrete Math	4
ENGR-UH 2013	Digital Logic	4
Credits		20

Total Credits 164

Learning Outcomes

Upon graduation, NYU Abu Dhabi Mechanical 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/>).