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.

Accreditation

The Mechanical 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 (http://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
General Education Requirements		
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
Core Competencies		
Arts, Design, and Technology		4
Cultural Exploration Analysis		4
Data and Discovery		4
Structures of Thought and Society		4
Major Requirements		
Science Courses (12 credits)		
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
Mathematics Courses (18 credits)		
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
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
ENGR-UH 2710	Differential Equations for Engineers	4
Engineering Common Courses (17 credits)		
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
Mechanical Engineering Required Courses (28 credits)		
ENGR-UH 2210	Engineering Dynamics	3
ENGR-UH 2211	Solid Mechanics	2
ENGR-UH 2212	Fluid Mechanics	3
ENGR-UH 3120	Engineering Materials	2
ENGR-UH 3210	Advanced Solid Mechanics	2
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 3752	Thermofluids Lab	1
ENGR-UH 4140	Mechatronics	3
ENGR-UH 4145	Mechatronics Lab	1
Mechanical Engineering Electives (13 credits)		
Complete at least 13 credits of Mechanical Engineering electives (see list below)		13
Capstone (6 credits)		
ENGR-UH 4011	Senior Design Capstone Project I	2

ENGR-UH 4020	Senior Design Capstone Project II	4
Other Electives		
Complete enough courses to reach the minimum overall required 128 credits		4
Total Credits		**128**

Mechanical Engineering Electives

Code	Title	Credits
CS-UH 2220	Machine Learning	4
ENGR-UH 2028	Tissue Engineering	2
ENGR-UH 2113	Introduction to Manufacturing Processes	2
ENGR-UH 2350	Hardware Design	4
ENGR-UH 2610	Fundamentals of Complex Variables	2
ENGR-UH 2810	Biomechanics	2
ENGR-UH 2812	Bioimaging	2
ENGR-UH 3111	Analysis of Chemical and Biological Processes	4
ENGR-UH 3230	Finite Element Modeling and Analysis	4
ENGR-UH 3332	Applied Machine Learning	4
ENGR-UH 3410	Structural Systems	2
ENGR-UH 3411	Environmental Engineering	4
ENGR-UH 3420	Project Management	2
ENGR-UH 3810	Quantitative Physiology	2
ENGR-UH 3812	Laser and Optics in Medicine	4
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 4230	Applied Optimization	4
ENGR-UH 4231	Membrane Science and Engineering	2
ENGR-UH 4330	Robotics	4
ENGR-UH 4423	Production and Logistics Management	4
ENGR-UH 4610	Control Systems Engineering	4
ENGR-UH 4701	Electrochemical Energy Devices	2
ENGR-UH 4712	Mechanics of Composite Materials	2
ENGR-UH 4760	Selected Topics in Mechanical Engineering	4
ENGR-UH 4810	Biomaterials	2
PHYS-UH 3213	Computational Physics	4

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
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		
	Credits	**16**
2nd Semester/Term		
ENGR-UH 1021	Design and Innovation	2
	Credits	**2**
3rd Semester/Term		
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
	Credits	**16**
4th Semester/Term		
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
ENGR-UH 3120	Engineering Materials	2
ENGR-UH 3720	Computer-Aided Design	2
Physical Education		
	Credits	**16**
5th Semester/Term		
Field Colloquia (J-Term)		3
	Credits	**3**
6th Semester/Term		
ENGR-UH 2210	Engineering Dynamics	3
ENGR-UH 2212	Fluid Mechanics	3
ENGR-UH 2710	Differential Equations for Engineers	4
ENGR-UH 3710	Thermodynamics	3
ENGR-UH 1010	Engineering Ethics	1
	Credits	**14**
7th Semester/Term		
ENGR-UH 2211	Solid Mechanics	2
ENGR-UH 3210	Advanced Solid Mechanics	2
ENGR-UH 3730	Modeling and Analysis of Dynamical Systems	3
ENGR-UH 3751	Heat Transport	3
ENGR-UH 3752	Thermofluids Lab	1
PHYS-UH 2115	Electricity and Magnetism for Engineers	4
	Credits	**15**
8th Semester/Term		
Field Colloquia (J-Term)		3
	Credits	**3**
9th Semester/Term		
Major Elective		3
Major Elective		3
Major Elective		3
Major Elective		4
Core Competency		4
	Credits	**17**
10th Semester/Term		
ENGR-UH 2010Q	Probability and Statistics for Engineers	2
ENGR-UH 2017	Numerical Methods	2
ENGR-UH 4011	Senior Design Capstone Project I	2
ENGR-UH 4140	Mechatronics	3
ENGR-UH 4145	Mechatronics Lab	1
Core Competency		4
	Credits	**14**
11th Semester/Term		
ENGR-UH 4020	Senior Design Capstone Project II	4
Core Competency		4
General Elective		4
	Credits	**12**
	Total Credits	**128**

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

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/).