MECHANICAL ENGINEERING (BS)

Department Website (https://engineering.nyu.edu/academics/departments/mechanical-and-aerospace-engineering/)

NYSED: 08829 **HEGIS:** 0910.00 **CIP:** 14.1901

Program Description

Mechanical engineering builds the physical systems and devices that define modern society — everything from air conditioning to automobiles, robots to power plants, artificial limbs to escalators, and rocket engines to weather satellites. Mechanical engineering offers almost limitless opportunity for the inventions and innovations that lead to entrepreneurial ventures.

Through hands-on computer and laboratory work in our state-of-the-art facilities, the School of Engineering's Bachelor of Science in Mechanical Engineering (BMSE) program teaches the principles underpinning the discipline and how to apply them in the field. Students also develop talents in such specialized areas as solid and fluid mechanics, machine control systems, and robotic devices. The BSME degree program is accredited by the Engineering Accreditation Commission of ABET.

Mechanical engineers find careers in industries including national defense, aerospace, automotive, and telecommunications. Mechanical engineering also has a long tradition of breaking new ground in such areas as resource conservation, improved efficiency of energy-consuming devices, and renewable energy sources. There are emerging opportunities in biomedical systems and devices, as well as nanotechnology and mechatronics. Alternatively, students can use their education as a springboard to law, medicine, corporate management, or further graduate studies.

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

The program requires the completion of 131 credits, and offers a combined Bachelor of Science degree with a minor in Aerospace Engineering for interested students. See BS/Minor requirements below.

Course	Title	Credits
General Education Requirements		
EXPOS-UA 1	Writing as Inquiry	4
EXPOS-UA 22	Advanced Writing for Engineers	4
Humanities and Social Sciences Electives (four 4-credit courses, for a total of 16 credits)		16
Major Requirements		
Computer Science		
CS-UY 1113	Problem Solving and Programming I	3
Mathematics		
MA-UY 1024	Calculus I for Engineers	4
MA-UY 1124	Calculus II for Engineers	4
MA-UY 2034	Linear Algebra and Differential Equations	4
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
Chemistry		
CM-UY 1003	General Chemistry for Engineers	3
CM-UY 1001	General Chemistry for Engineers Laboratory	1
Physics		
PH-UY 1013	Mechanics	3
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
Engineering		
EG-UY 1004	Introduction to Engineering and Design	4
ME-UY 1012	Introduction to Mechanical Engineering	2
ME-UY 2213	Statics	3
ME-UY 2123	Engineering Design Methods	3
ME-UY 2813	Introduction to Materials Science	3
ME-UY 2223	Dynamics	3
ME-UY 3811	Materials Science Laboratory	1
ME-UY 3213	Mechanics of Materials	3
ME-UY 3333	Thermodynamics	3
ME-UY 3511	Measurement Systems Laboratory	1
ME-UY 3513	Measurement Systems	3
ME-UY 3233	Machine Design	3
ME-UY 3231	Structures Practicum	1
ME-UY 3313	Fluid Mechanics	3
ME-UY 3411	Automatic Control Laboratory	1
ME-UY 3413	Automatic Control	3
ME-UY 4103	Senior Design I	3
ME-UY 4214	Finite Element Modeling, Design and Analysis	4
ME-UY 4312	Thermo-Fluids Practicum	2
ME-UY 4313	Heat Transfer	3
ME-UY 4113	Senior Design II	3
Electives		
STEM Electives		6
Math/Science Elective		4
Physics Elective		3
Free Electives		9
Total Credits		**131**

Mechanical Engineering (BS)/Aerospace Engineering (Minor)

Program Requirements

This combined BS/Minor program requires the completion of 131 credits, comprised of the following:

Course	Title	Credits
General Education Requirements		
EXPOS-UA 1	Writing as Inquiry	4
EXPOS-UA 22	Advanced Writing for Engineers	4
Humanities and Social Sciences Electives (four 4-credit courses, for a total of 16 credits)		16
Major Requirements		

Computer Science		
CS-UY 1113	Problem Solving and Programming I	3
Chemistry		
CM-UY 1003	General Chemistry for Engineers	3
CM-UY 1001	General Chemistry for Engineers Laboratory	1
Physics		
PH-UY 1013	Mechanics	3
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
Engineering		
EG-UY 1004	Introduction to Engineering and Design	4
ME-UY 1012	Introduction to Mechanical Engineering	2
ME-UY 2213	Statics	3
ME-UY 2123	Engineering Design Methods	3
ME-UY 2813	Introduction to Materials Science	3
ME-UY 2223	Dynamics	3
ME-UY 3811	Materials Science Laboratory	1
ME-UY 3213	Mechanics of Materials	3
ME-UY 3333	Thermodynamics	3
ME-UY 3511	Measurement Systems Laboratory	1
ME-UY 3513	Measurement Systems	3
ME-UY 3233	Machine Design	3
ME-UY 3231	Structures Practicum	1
ME-UY 3313	Fluid Mechanics	3
ME-UY 3411	Automatic Control Laboratory	1
ME-UY 3413	Automatic Control	3
ME-UY 4103	Senior Design I	3
ME-UY 4214	Finite Element Modeling, Design and Analysis	4
ME-UY 4312	Thermo-Fluids Practicum	2
ME-UY 4313	Heat Transfer	3
ME-UY 4113	Senior Design II	3
Mathematics		
MA-UY 1024	Calculus I for Engineers	4
MA-UY 1124	Calculus II for Engineers	4
MA-UY 2034	Linear Algebra and Differential Equations	4
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
Aerospace Engineering		
AE-UY 4603	Compressible Flow	3
AE-UY 4653	Aircraft Flight Mechanics	3
AE-UY 4613	Aerodynamics	3
AE-UY 4633	Aerospace Propulsion	3
Electives		
Physics Elective		3
Math/Science Elective		4
Free Elective		3
Total Credits		**131**

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MA-UY 1024	Calculus I for Engineers	4
CM-UY 1003	General Chemistry for Engineers	3
CM-UY 1001	General Chemistry for Engineers Laboratory	1
EXPOS-UA 1	Writing as Inquiry	4
EG-UY 1004	Introduction to Engineering and Design	4
	Credits	**16**
2nd Semester/Term		
MA-UY 1124	Calculus II for Engineers	4
PH-UY 1013	Mechanics	3
ME-UY 1012	Introduction to Mechanical Engineering	2
CS-UY 1113	Problem Solving and Programming I	3
EXPOS-UA 22	Advanced Writing for Engineers	4
	Credits	**16**
3rd Semester/Term		
MA-UY 2034	Linear Algebra and Differential Equations	4
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
ME-UY 2213	Statics	3
Humanities and Social Sciences Elective [1]		4
	Credits	**15**
4th Semester/Term		
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
ME-UY 2123	Engineering Design Methods	3
ME-UY 2813	Introduction to Materials Science	3
ME-UY 2223	Dynamics	3
Humanities and Social Sciences Elective [1]		4
	Credits	**17**
5th Semester/Term		
ME-UY 3811	Materials Science Laboratory	1
ME-UY 3213	Mechanics of Materials	3
ME-UY 3333	Thermodynamics	3
ME-UY 3511	Measurement Systems Laboratory	1
ME-UY 3513	Measurement Systems	3
STEM[2] Elective [2]		3
Humanities and Social Sciences Elective [1]		4
	Credits	**18**
6th Semester/Term		
ME-UY 3233	Machine Design	3
ME-UY 3231	Structures Practicum	1
ME-UY 3313	Fluid Mechanics	3
ME-UY 3411	Automatic Control Laboratory	1
ME-UY 3413	Automatic Control	3
Math/Science Elective [3]		4
	Credits	**15**
7th Semester/Term		
ME-UY 4103	Senior Design I	3
ME-UY 4214	Finite Element Modeling, Design and Analysis	4
ME-UY 4312	Thermo-Fluids Practicum	2
ME-UY 4313	Heat Transfer	3
STEM[2] Elective [2]		3
Free Elective [4]		3
	Credits	**18**
8th Semester/Term		
ME-UY 4113	Senior Design II	3
Physics Elective [5]		3
Free Elective [4]		3
Free Elective [4]		3
Humanities and Social Sciences Elective [1]		4
	Credits	**16**
	Total Credits	**131**

[1] Students must take at least sixteen credits of elective courses in the humanities and social sciences. The number of total humanities and social sciences credits (including EXPOS-UA 1 Writing as Inquiry

& EXPOS-UA 22 Advanced Writing for Engineers) must add up to at least twenty four. At least one humanities and social sciences (HuSS) elective must be an Advanced Seminar Series course. And at least one humanities and social sciences elective must be an Ethics course.

2 STEM[2] electives are satisfied by the following Tandon courses:

- Any level 2 or higher course starting with the prefix AE-UY, BMS-UY, CBE-UY, CM-UY, CE-UY, CS-UY, ECE-UY, EG-UY, FIN-UY, DM-UY, MA-UY, ME-UY, MG-UY, PH-UY, ROB-UY, STS-UY, or VIP-UY
- Any graduate course starting with BE-GY, BI-GY, BT-GY, BTE-GY, CBE-GY, CM-GY, CE-GY, CS-GY, DM-GY, IE-GY, MG-GY, MA-GY, ME-GY, ROB-GY, or TR-GY
- Any course which satisfies Humanities credit must be in excess of the NYU Tandon 24 credit Humanities and Social Sciences (HuSS) requirement to be eligible for STEM[2] elective credit. Double-counting HuSS credit and STEM[2] credit is not permitted.

3 A Math/Science Elective is any Tandon math or science course which is level 2 or higher starting with the prefix BMS-UY, CM-UY, MA-UY, PH-UY.

4 A free elective is any course in any department of the University for which the student has the prerequisites. Free electives may include internships for credit (CP-UY 2xxx or Study Abroad courses). A total of six internship credits may be applied to the BSME degree. Letter graded and pass/fail approved internship courses are allowable.

5 A Physics Elective is any Tandon physics course which is level 2 or higher starting with the prefix PH-UY.

Mechanical Engineering (BS)/Aerospace Engineering (Minor)

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
EG-UY 1004	Introduction to Engineering and Design	4
MA-UY 1024	Calculus I for Engineers	4
CM-UY 1003	General Chemistry for Engineers	3
CM-UY 1001	General Chemistry for Engineers Laboratory	1
EXPOS-UA 1	Writing as Inquiry	4
	Credits	**16**
2nd Semester/Term		
MA-UY 1124	Calculus II for Engineers	4
PH-UY 1013	Mechanics	3
ME-UY 1012	Introduction to Mechanical Engineering	2
CS-UY 1113	Problem Solving and Programming I	3
EXPOS-UA 22	Advanced Writing for Engineers	4
	Credits	**16**
3rd Semester/Term		
MA-UY 2034	Linear Algebra and Differential Equations	4
PH-UY 2023	Electricity, Magnetism, & Fluids	3
PH-UY 2121	General Physics Laboratory I	1
ME-UY 2213	Statics	3
Humanities and Social Sciences Elective [1]		4
	Credits	**15**
4th Semester/Term		
MA-UY 2114	Calculus III: Multi-Dimensional Calculus	4
ME-UY 2123	Engineering Design Methods	3
ME-UY 2813	Introduction to Materials Science	3
ME-UY 2223	Dynamics	3
Humanities and Social Sciences Elective [1]		4
	Credits	**17**
5th Semester/Term		
ME-UY 3811	Materials Science Laboratory	1
ME-UY 3213	Mechanics of Materials	3
ME-UY 3333	Thermodynamics	3
ME-UY 3511	Measurement Systems Laboratory	1
ME-UY 3513	Measurement Systems	3
Humanities and Social Sciences Elective [1]		4
Physics Elective [5]		3
	Credits	**18**
6th Semester/Term		
ME-UY 3233	Machine Design	3
ME-UY 3231	Structures Practicum	1
ME-UY 3313	Fluid Mechanics	3
ME-UY 3411	Automatic Control Laboratory	1
ME-UY 3413	Automatic Control	3
Math/Science Elective [3]		4
	Credits	**15**
7th Semester/Term		
ME-UY 4103	Senior Design I	3
ME-UY 4214	Finite Element Modeling, Design and Analysis	4
ME-UY 4312	Thermo-Fluids Practicum	2
ME-UY 4313	Heat Transfer	3
AE-UY 4603	Compressible Flow	3
AE-UY 4653	Aircraft Flight Mechanics	3
	Credits	**18**
8th Semester/Term		
ME-UY 4113	Senior Design II	3
AE-UY 4613	Aerodynamics	3
AE-UY 4633	Aerospace Propulsion	3
Free Elective [4]		3
Humanities and Social Sciences Elective [1]		4
	Credits	**16**
	Total Credits	**131**

Learning Outcomes

Upon successful completion of the program, graduates will be able to demonstrate the following (per ABET):

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

GPA Policy

Please note that students must earn an average of 2.0 GPA or better after their first four semesters at Tandon, in addition to meeting the School requirement of a 2.0 GPA or better for graduation. Seniors with GPAs of 3.5 or better may take certain graduate courses as electives with approval from the departmental adviser. Students on academic probation usually are permitted to preregister for the next semester, but are obliged to consult with their adviser after grades are posted and before classes begin.

Departmental GPA Requirements

All ME majors must satisfy the following minimum GPA requirements per the table below:

Number of Full-Time Semesters Completed	Minimum Required Cumulative GPA	Minimum Number of Credits Earned
1	1.5	8
2	1.70	16
3	1.85	28
4	2.0	40
5	2.0	56
6	2.0	68
7	2.0	84
8	2.0	96
9	2.0	112
10	2.0	128

Any student who does not meet the requirements above after the first semester will be automatically placed on final probation. Any student who does not meet the requirements above after the second semester will be automatically disqualified.

Transfer Students in the Mechanical Engineering Program

All transfer students must meet the School's minimum residency requirement of 66 credits. In addition, transfer students in the Mechanical Engineering Program are required to take all junior and senior mechanical engineering courses and technical electives at NYU Tandon. However, junior and select senior ME courses could be taken during an approved Study Abroad experience. Senior Design I & II must be taken at Tandon.

Qualified graduates of two-year pre-engineering programs, such as those offered at several community colleges and four-year liberal-arts colleges, often may fulfill the requirements for BS in Mechanical Engineering in two additional years. Since such programs vary from college to college, students should meet with the mechanical engineering undergraduate adviser for guidance. The School has formal articulation agreements with some colleges; as a result, students from these schools have a series of transfer courses preapproved.

NYU Policies

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

Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (https://bulletins.nyu.edu/undergraduate/engineering/academic-policies/).