PHYSICS/CIVIL ENGINEERING (BS/BS)

Department Website (http://cas.nyu.edu/engineering/)

NYSED: 33283 **HEGIS:** 1902.00 **CIP:** 40.0801

Program Description

Since the fall of 2010, the College's dual degree program with the NYU Tandon School of Engineering, formerly known as the Polytechnic School of Engineering, has offered highly qualified and motivated students who are technically oriented the opportunity to pursue both a liberal arts program with a major in science, mathematics, or computer science and a traditional engineering program. Upon completion of this five-year program, students receive both a BS degree from the College of Arts and Science and a BS degree from the NYU Tandon School of Engineering. Students with this combination of degrees are likely to find excellent employment opportunities.

It is crucial that students begin the required dual-degree coursework in their first year.

The available dual degree combinations are as follows:

- BS in Biology/BS in Chemical and Biomolecular Engineering
- BS in Chemistry/BS in Chemical and Biomolecular Engineering
- BS in Computer Science/BS in Computer Engineering
- BS in Computer Science/BS in Electrical Engineering
- BS in Mathematics/BS in Civil Engineering
- BS in Mathematics/BS in Computer Engineering
- BS in Mathematics/BS in Electrical Engineering
- BS in Mathematics/BS in Mechanical Engineering
- BS in Physics/BS in Civil Engineering
- BS in Physics/BS in Computer Engineering
- BS in Physics/BS in Electrical Engineering
- BS in Physics/BS in Mechanical Engineering

Students in the program complete all of the CAS College Core Curriculum requirements, with the exception of the foreign language requirement, from which they are exempted. (Their required mathematics and science courses automatically satisfy the Core's Foundations of Scientific Inquiry requirements.) There is usually some flexibility concerning the semester in which a given course can be taken. Detailed programs of study for each of the degree combinations are available on the program website for reference.

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
CAS Core + Tandon General Education Requirements		
EXPOS-UA 1	Writing as Inquiry	4
First-Year Seminar		4
Texts and Ideas		4
Cultures and Contexts		4
Societies and the Social Sciences		4
Expressive Culture		4
Major Requirements		
MATH-UA 121	Calculus I	4
MATH-UA 122	Calculus II	4
MATH-UA 123	Calculus III	4
MATH-UA 140	Linear Algebra	4
MATH-UA 185	Probability & Statistics (Formerly MATH-UA 235 Probability & Statistics)	4
MATH-UA 262	Ordinary Diff Equations	4
PHYS-UA 91	Physics I	3
PHYS-UA 93	Physics II	3
PHYS-UA 95	Physics III	3
PHYS-UA 71	Introductory Experimental Physics I	2
PHYS-UA 72	Introductory Experimental Physics II	2
PHYS-UA 73	Intermediate Experimental Physics I	2
PHYS-UA 74	Intermediate Experimental Physics II	2
PHYS-UA 120	Dynamics	3
PHYS-UA 106	Mathematical Physics	3
PHYS-UA 123	Quantum Mechanics I	3
PHYS-UA 131	Electricity & Magnet I	3
PHYS-UA 112	Advanced Experimental Physics	3
PHYS-UA 140	Thermal & Statistical Physics	3
CM-UY 1003	General Chemistry for Engineers	3
CM-UY 1001	General Chemistry for Engineers Laboratory	1
CS-UY 1113	Problem Solving and Programming I	3
EG-UY 1004	Introduction to Engineering and Design	4
CE-UY 1002	Introduction to Civil and Environmental Engineering	2
CE-UY 2143	Analysis of Determinate Structures	3
CE-UY 2213	Fluid Mechanics and Hydraulics	3
CE-UY 2343	Transportation Engineering	3
CE-UY 2533	Construction Project Management	3
CE-UY 3013	Computing in Civil Engineering	3
CE-UY 3153	Geotechnical Engineering	3
CE-UY 3163	Materials for the Built Environment	3
CE-UY 3183	Structural Engineering	3
CE-UY 3223	Fundamentals of Environmental Engineering	3
CE-UY 3243	Water Resources Engineering	3
CE-UY 4092	Leadership, Business Principles, Policy and Ethics in Civil Engineering	2
CE-UY 4803	Civil Engineering Capstone	3
Civil Engineering Concentration Capstone		3
CE-UY 4990	Fundamentals of Engineering Exam Registration for CUE	0
Electives		
Civil Engineering Electives (3)		9
Humanities/Social Sciences Electives (2)		8
Free Elective		1
Physics Electives (0110 and above)		6

Science Elective (not Physics or Chemistry)	3
Other Elective Credits	3
Total Credits	**164**

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
MATH-UA 121	Calculus I	4
EXPOS-UA 1	Writing as Inquiry	4
First-Year Seminar		4
PHYS-UA 91	Physics I	3
PHYS-UA 71	Introductory Experimental Physics I	2
	Credits	**17**
2nd Semester/Term		
MATH-UA 122	Calculus II	4
PHYS-UA 93	Physics II	3
PHYS-UA 72	Introductory Experimental Physics II	2
Texts and Ideas		4
EG-UY 1004	Introduction to Engineering and Design	4
	Credits	**17**
3rd Semester/Term		
MATH-UA 123	Calculus III	4
Cultures and Contexts		4
PHYS-UA 95	Physics III	3
PHYS-UA 73	Intermediate Experimental Physics I	2
CS-UY 1113	Problem Solving and Programming I	3
	Credits	**16**
4th Semester/Term		
PHYS-UA 120	Dynamics	3
PHYS-UA 74	Intermediate Experimental Physics II	2
PHYS-UA 106	Mathematical Physics	3
Societies and the Social Sciences		4
CE-UY 1002	Introduction to Civil and Environmental Engineering	2
MATH-UA 140	Linear Algebra	4
	Credits	**18**
5th Semester/Term		
PHYS-UA 123	Quantum Mechanics I	3
PHYS-UA 131	Electricity & Magnet I	3
MATH-UA 262	Ordinary Diff Equations	4
CM-UY 1003 & CM-UY 1001	General Chemistry for Engineers and General Chemistry for Engineers Laboratory	4
Other Elective Credits		3
	Credits	**17**
6th Semester/Term		
PHYS-UA 112	Advanced Experimental Physics	3
PHYS-UA 140	Thermal & Statistical Physics	3
Physics Elective (0110 and up)		3
CE-UY 2143	Analysis of Determinate Structures	3
CE-UY 2213	Fluid Mechanics and Hydraulics	3
	Credits	**15**
7th Semester/Term		
CE-UY 2533	Construction Project Management	3
CE-UY 2343	Transportation Engineering	3
MATH-UA 185	Probability & Statistics (Formerly MATH-UA 235 Probability & Statistics)	4
Expressive Culture		4
HU/SS Elective		4
	Credits	**18**
8th Semester/Term		
Civil Engineering Elective		3
CE-UY 3153	Geotechnical Engineering	3
CE-UY 3183	Structural Engineering	3
CE-UY 3013	Computing in Civil Engineering	3
CE-UY 3223	Fundamentals of Environmental Engineering	3
CE-UY 3243	Water Resources Engineering	3
	Credits	**18**
9th Semester/Term		
CE-UY 4803	Civil Engineering Capstone	3
CE-UY 4092	Leadership, Business Principles, Policy and Ethics in Civil Engineering	2
Physics Elective (0110 and up)		3
Civil Engineering Elective		3
CE-UY 4990	Fundamentals of Engineering Exam Registration for CUE	0
CE-UY 3163	Materials for the Built Environment	3
	Credits	**14**
10th Semester/Term		
Civil Engineering Concentration Capstone		3
HU/SS Elective		4
Civil Engineering Electives		3
Science Elective		3
Other Elective Credits		1
	Credits	**14**
	Total Credits	**164**

Learning Outcomes

College of Arts and Science

Upon completion of program requirements, students are expected to have acquired:

1. A fundamental command of physics, as well as of the subdisciplines of classical mechanics and electromagnetism, special relativity, quantum mechanics, and statistical and thermal physics.
2. Facility in advanced topics (chosen from among general relativity, condensed matter physics, biophysics, and others) relevant to modern research.
3. The mathematical skills required to describe and predict the behavior of physical systems from first principles.
4. The experimental and analytical skills needed to test the application of physical laws to real systems.
5. Facility in advanced topics in mathematics, chemistry, and/or biology, and an understanding of their relation to concepts in physics.

Tandon School of Engineering

1. Apply scientific principles, interdisciplinary knowledge, critical thinking skills, cutting-edge technology, and a passion for civil engineering to solve complex engineering and societal problems.
2. Demonstrate leadership in professional careers, pursue continuous and lifelong learning, and progress towards professional licensure.
3. Communicate and collaborate effectively with industry professionals, decision-makers, and community stakeholders.
4. Work in an ethical and professional manner towards sustainable and resilient civil and urban infrastructure systems.
5. Successfully perform functions of civil engineering practice, including analysis, design, project management, experimentation, interpretation of data, application of new knowledge, and use of sound engineering judgment to draw conclusions.

Policies

Program Policies

Students may elect to withdraw from the dual-degree program in Engineering and complete only the College of Arts and Science Core and major requirements, thus earning one undergraduate degree from CAS. If students elect to withdraw from the dual-degree program and remain in CAS, they are no longer exempt from the CAS foreign language requirement and must factor this into their academic planning.

Also, if students elect to withdraw from the dual degree program and remain in CAS, any Tandon courses taken will count against each student's 16-point allowance in the other divisions of NYU and also cannot be applied toward the 64-point UA residency requirement.

NYU Policies

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

College of Arts and Science Policies

A full list of relevant academic policies can be found on the CAS Academic Policies page (https://bulletins.nyu.edu/undergraduate/arts-science/academic-policies/).