CHEMISTRY/CHEMICAL AND BIOMOLECULAR ENGINEERING (BS/BS)

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

NYSED: 33276 **HEGIS:** 1905.00 **CIP:** 40.0501

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 B.S. degree from the College of Arts and Science and a B.S. 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		
BIOL-UA 11	Principles of Biology I	4
BIOL-UA 12	Principles of Biology II	4
BIOL-UA 123	Principles of Biology Laboratory	1
CHEM-UA 125	General Chemistry I & Laboratory	5
CHEM-UA 126	General Chemistry II & Laboratory	5
CHEM-UA 225	Organic Chemistry I & Laboratory	5
CHEM-UA 226	Organic Chemistry II & Laboratory	5
CHEM-UA 651	Quantum Mechanics & Spectroscopy	4
CHEM-UA 652	Thermodynamics & Kinetics	4
CHEM-UA 661	Physical Chemistry Laboratory	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
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 262	Ordinary Diff Equations	4
CSCI-UA 101	Intro to Computer Science	4
EG-UY 1004	Introduction to Engineering and Design	4
CBE-UY 2124	Analysis of Chemical and Biomolecular Processes	4
CBE-UY 3313	Transport I	3
CBE-UY 3323	Transport II	3
CBE-UY 3153	Chemical and Biomolecular Engineering Thermodynamics	3
CBE-UY 2233	Chemical Engineering Computation	3
CBE-UY 3233	Chem & Biomolecular Eng Separations	3
CBE-UY 3223	Kinetics and Reactor Design	3
CBE-UY 4113	Engineering Laboratory I	3
CBE-UY 4213	Engineering Laboratory II	3
CBE-UY 4163	Chemical and Biomolecular Process Design I	3
CBE-UY 4263	Chemical and Biomolecular Process Design II	3
CBE-UY 4143	Process Dynamics and Control	3
CBE-UY 3173	Polymeric Materials	3
CBE-UY 4223	Biochemical Engineering	3
Electives		
Humanities/Social Science Electives (2)		8
Total Credits		**159**

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CHEM-UA 125	General Chemistry I & Laboratory	5
MATH-UA 121	Calculus I	4
BIOL-UA 11	Principles of Biology I	4
EXPOS-UA 1	Writing as Inquiry	4
	Credits	**17**
2nd Semester/Term		
CHEM-UA 126	General Chemistry II & Laboratory	5
EG-UY 1004	Introduction to Engineering and Design	4
BIOL-UA 12	Principles of Biology II	4
BIOL-UA 123	Principles of Biology Laboratory	1
First-Year Seminar		4
	Credits	**18**
3rd Semester/Term		
CHEM-UA 225	Organic Chemistry I & Laboratory	5
MATH-UA 122	Calculus II	4
PHYS-UA 91	Physics I	3
PHYS-UA 71	Introductory Experimental Physics I	2
Texts and Ideas		4
	Credits	**18**
4th Semester/Term		
CHEM-UA 226	Organic Chemistry II & Laboratory	5
MATH-UA 123	Calculus III	4
PHYS-UA 93	Physics II	3
PHYS-UA 72	Introductory Experimental Physics II	2
Cultures and Contexts		4
	Credits	**18**
5th Semester/Term		
CHEM-UA 651	Quantum Mechanics & Spectroscopy	4
PHYS-UA 95	Physics III	3
MATH-UA 140	Linear Algebra	4
PHYS-UA 73	Intermediate Experimental Physics I	2
CBE-UY 2124	Analysis of Chemical and Biomolecular Processes	4
	Credits	**17**
6th Semester/Term		
CHEM-UA 652	Thermodynamics & Kinetics	4
MATH-UA 262	Ordinary Diff Equations	4
CHEM-UA 661	Physical Chemistry Laboratory	4
CBE-UY 2233	Chemical Engineering Computation	3
	Credits	**15**
7th Semester/Term		
CSCI-UA 101	Intro to Computer Science	4
CBE-UY 3313	Transport I	3
CBE-UY 3153	Chemical and Biomolecular Engineering Thermodynamics	3
Societies and the Social Sciences		4
	Credits	**14**
8th Semester/Term		
CBE-UY 3233	Chem & Biomolecular Eng Separations	3
CBE-UY 3223	Kinetics and Reactor Design	3
CBE-UY 3323	Transport II	3
Humanities/Social Science Elective		4
Expressive Culture		4
	Credits	**17**
9th Semester/Term		
CBE-UY 4113	Engineering Laboratory I	3
CBE-UY 4143	Process Dynamics and Control	3
CBE-UY 4163	Chemical and Biomolecular Process Design I	3
Degree Elective		4
	Credits	**13**
10th Semester/Term		
CBE-UY 4213	Engineering Laboratory II	3
CBE-UY 4263	Chemical and Biomolecular Process Design II	3
CBE-UY 4223	Biochemical Engineering	3
CBE-UY 3173	Polymeric Materials	3
	Credits	**12**
	Total Credits	**159**

Learning Outcomes

College of Arts and Science

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

1. A fundamental command of chemistry, as well as of the subdisciplines of organic, inorganic, and physical chemistry.
2. Facility (via elective offerings) in analytical chemistry and/or mathematical and machine computational methods.
3. Mastery of laboratory skills in organic and physical chemistry.
4. Familiarity with contemporary problems in chemistry and the ability to articulate these problems and propose well-considered solutions.
5. Expertise in modern research methods as applied in contemporary scientific studies.

Tandon School of Engineering

The goals of the BS degree in Chemical and Biomolecular Engineering are:

1. Students will learn the major concepts of chemistry and biology and their relations to biomolecular science and engineering.
2. Students will learn the use of basic chemical and biological techniques and instrumentation.
3. Students will be prepared for advanced studies and research in biomolecular science and engineering and related fields.
4. Students will be prepared for employment in biomedical and other health-related fields, STEM education, and post-graduate studies.

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-credit allowance in the other divisions of NYU, and also cannot be applied toward the 64-credit 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/).