BIOLOGY/CHEMICAL AND BIOMOLECULAR ENGINEERING (BS/BS)

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

NYSED: 33275 **HEGIS:** 0401.00 **CIP:** 26.0101

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 The Essay:	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		4
BIOL-UA 123		1
BIOL-UA 21	Molecular and Cell Biology I	4
BIOL-UA 223	Molecular and Cell Biology Laboratory	1
BIOL-UA 22		4
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
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 4123		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		
Advanced Biology Elective		4

Humanities/Social Science Electives (2)	8
Total Credits	**168**

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 The Essay:	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		4
BIOL-UA 123		1
First-Year Seminar		4
	Credits	**18**
3rd Semester/Term		
PHYS-UA 91	Physics I	3
PHYS-UA 71	Introductory Experimental Physics I	2
MATH-UA 122	Calculus II	4
BIOL-UA 21	Molecular and Cell Biology I	4
BIOL-UA 223	Molecular and Cell Biology Laboratory	1
Texts and Ideas		4
	Credits	**18**
4th Semester/Term		
PHYS-UA 93	Physics II	3
PHYS-UA 72	Introductory Experimental Physics II	2
BIOL-UA 22		4
MATH-UA 140	Linear Algebra	4
MATH-UA 123	Calculus III	4
	Credits	**17**
5th Semester/Term		
CHEM-UA 651	Quantum Mechanics & Spectroscopy	4
CHEM-UA 225	Organic Chemistry I & Laboratory	5
PHYS-UA 95	Physics III	3
PHYS-UA 73	Intermediate Experimental Physics I	2
CBE-UY 2124	Analysis of Chemical and Biomolecular Processes	4
	Credits	**18**
6th Semester/Term		
CHEM-UA 652	Thermodynamics & Kinetics	4
CHEM-UA 226	Organic Chemistry II & Laboratory	5
MATH-UA 262	Ordinary Diff Equations	4
CBE-UY 2233	CHEMICAL ENGINEERING COMPUTATION	3
	Credits	**16**
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
Cultures and Contexts		4
CBE-UY 3173	Polymeric Materials	3
	Credits	**17**
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
Advanced Bio Elective		4
Societies and the Social Sciences		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
HU/SS Elective		4
Expressive Culture		4
	Credits	**17**
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
HU/SS Elective		4
	Credits	**13**
	Total Credits	**168**

Learning Outcomes

College of Arts and Science

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

1. A foundation of knowledge in current concepts of, and the mechanisms underlying, living systems.
2. Skills that enable them to reason critically and to analyze primary literature in the life sciences.
3. Experience in problem-solving, including quantitative analysis.
4. The ability to use the scientific method to design and implement controlled experiments or tests to address explicit hypotheses.
5. Proficiency in communicating scientific ideas in both oral and written formats, and also in collaborating on common scientific projects.

Tandon School of Engineering

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

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/).