

# COMPUTER SCIENCE (BS)

Department Website (<https://engineering.nyu.edu/academics/departments/computer-science-and-engineering/>)

NYSED: 08772 HEGIS: 0701.00 CIP: 11.0101

## Program Description

Computer science focuses on how to design, build, and effectively use the computers and systems that we interact with every day from the smart phones in our hands to the complex databases in our banks and hospitals. Because computer technology powers the most essential functions of business, industry, government and entertainment, computer scientists have tremendous opportunities for growth and exploration.

In addition to the BS degree in Computer Science, the Computer Science and Engineering department offers minors in Computer Science, Cybersecurity, and Game Engineering.

The program provides research labs for specialized study in areas such as cybersecurity, game engineering, and big data, areas in which our department has a distinctive strength. In addition, the program's close ties to our graduate division immerse students in a vibrant, intellectual atmosphere.

## 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 128 credits, comprised of the following:

Course	Title	Credits
<b>Major Requirements</b>		
<i>Computer Science</i>		
CS-UY 1114	Intro To Programming & Problem Solving	4
CS-UY 1134	Data Structures and Algorithms	4
CS-UY 2124	Object Oriented Programming	4
CS-UY 1122	Introduction to Computer Science	2
CS-UY 2214	Computer Architecture and Organization	4
CS-UY 3224	Intro to Operating System	4
CS-UY 2413	Design & Analysis of Algorithms	3
CS-UY 4513	Software Engineering	3
CS-UY 4523	Design Project	3
<i>Mathematics</i> <sup>1</sup>		
MA-UY 1024	Calculus I for Engineers	4
MA-UY 1124	Calculus II for Engineers	4
MA-UY 2314	Discrete Mathematics	4
MA-UY 2224	Probability and Statistics for Engineers	4
<i>Engineering</i>		
EG-UY 1004	Introduction to Engineering and Design	4
<b>Science Requirement</b>		
Select three of the following: <sup>2</sup>		9-12

CM-UY 1003	General Chemistry for Engineers	
CM-UY 1013	General Chemistry I	
BMS-UY 1003	Introduction to Cell and Molecular Biology	
PH-UY 1013	Mechanics	
PH-UY 2023	Electricity, Magnetism, & Fluids	
PH-UY 2033	Waves, Optics, & Thermodynamics	
<i>Humanities and Social Sciences</i>		
EXPOS-UA 1	Writing as Inquiry	4
EXPOS-UA 22	Advanced Writing for Engineers	4
Select one Ethics course		4
Select three humanities and social sciences courses <sup>3</sup>		12
<b>Electives</b>		
Select 18 additional credits in computer science electives <sup>4</sup>		18
Select 26 credits of free electives <sup>4,5</sup>		26
<b>Total Credits</b>		<b>128</b>

<sup>1</sup> MA-UY 914 Precalculus for Engineers does not count toward the Math requirement.

MA-UY 2034 Linear Algebra and Differential Equations or another linear algebra course is recommended, but not required. Some CS electives have knowledge of linear algebra as a prerequisite. Students planning to take such electives should plan accordingly.

<sup>2</sup> Students may choose any three natural science courses (each at least 3 credits) offered by the NYU Tandon School of Engineering, provided that they meet pre-requisites and co-requisites. Other natural science courses may be approved by the CSE department.

<sup>3</sup> One must be an Advanced Seminar course.

<sup>4</sup> With approval of the CSE department, certain closely related courses in EE, Math or other related disciplines may be substituted for CS electives. A list of approved substitutions is available in the CSE department.

<sup>5</sup> NYU SPS courses are not accepted as free electives.

## Sample Plan of Study

Course	Title	Credits
<b>1st Semester/Term</b>		
CS-UY 1114	Intro To Programming & Problem Solving <sup>1</sup>	4
EG-UY 1004	Introduction to Engineering and Design	4
EXPOS-UA 1	Writing as Inquiry	4
MA-UY 1024	Calculus I for Engineers <sup>2</sup>	4
<b>Credits</b>		<b>16</b>
<b>2nd Semester/Term</b>		
CS-UY 1134	Data Structures and Algorithms <sup>1</sup>	4
CS-UY 1122	Introduction to Computer Science	2
MA-UY 1124	Calculus II for Engineers	4
EXPOS-UA 22	Advanced Writing for Engineers	4
Science Elective <sup>3</sup>		3
<b>Credits</b>		<b>17</b>
<b>3rd Semester/Term</b>		
CS-UY 2124	Object Oriented Programming <sup>1</sup>	4
MA-UY 2314	Discrete Mathematics	4
Science Elective <sup>3</sup>		3
Humanities and Social Sciences Elective <sup>4</sup>		4
<b>Credits</b>		<b>15</b>
<b>4th Semester/Term</b>		
CS-UY 2214	Computer Architecture and Organization	4
CS-UY 2413	Design & Analysis of Algorithms	3
MA-UY 2224	Probability and Statistics for Engineers	4

Humanities and Social Sciences Elective <sup>4</sup>	4
<b>Credits</b>	<b>15</b>
<b>5th Semester/Term</b>	
CS-UY 3224 Intro to Operating System	4
CS Elective <sup>5</sup>	3
Humanities and Social Sciences Elective <sup>4</sup>	4
Science Elective <sup>3</sup>	3
Free Elective	3
<b>Credits</b>	<b>17</b>
<b>6th Semester/Term</b>	
CS Elective <sup>5</sup>	3
CS Elective <sup>5</sup>	3
Humanities and Social Sciences Elective <sup>4</sup>	4
Free Elective	3
Free Elective	3
<b>Credits</b>	<b>16</b>
<b>7th Semester/Term</b>	
CS-UY 4513 Software Engineering	3
CS Elective <sup>5</sup>	3
CS Elective <sup>5</sup>	3
Free Elective	3
Free Elective	4
<b>Credits</b>	<b>16</b>
<b>8th Semester/Term</b>	
CS-UY 4523 Design Project	3
CS Elective <sup>5</sup>	3
Free Elective	4
Free Elective	3
Free Elective	3
<b>Credits</b>	<b>16</b>
<b>Total Credits</b>	<b>128</b>

<sup>1</sup> Grade of C- or better is required in CS-UY 1114 Intro To Programming & Problem Solving, CS-UY 1134 Data Structures and Algorithms, and CS-UY 2124 Object Oriented Programming. Students who take CS-UY 1113 Problem Solving and Programming I and CS-UY 1121 Problem Solving via Programming may count four credits toward the CS requirements of the major, in lieu of CS-UY 1114 Intro To Programming & Problem Solving.

<sup>2</sup> Students who are placed by examination or by an adviser into MA-UY 914 Precalculus for Engineers must defer registration for MA-UY 1024 Calculus I for Engineers.

<sup>3</sup> The Science electives may be chosen from any of the following natural sciences (Physics, Biology, and Chemistry).

<sup>4</sup> Please see the NYU Tandon General Education Requirements (<https://engineering.nyu.edu/academics/departments/technology-culture-and-society/general-education-requirements/>) for further information about the Humanities and Social Sciences (HUSS) electives.

<sup>5</sup> With approval of the CSE department, certain closely related courses in EE, Math or other related disciplines may be substituted for CS electives. A list of approved substitutions is available in the CSE department.

4. Develop laboratory and software skills for advanced project development and research activity.

## Policies

### 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/>).

## Learning Outcomes

Upon successful completion of the program, graduates will:

1. Learn fundamentals of computer science theory and practice in order to contribute to industry, academic, and government activities.
2. Learn modern design and development techniques.
3. Enhance their base of knowledge with appropriate electives.