COMPUTER SCIENCE (BS)

CIP: 11.0701

Program Description

Computer Science at NYU Shanghai is designed to create technological leaders with a global perspective, a broad education, and the capacity to think creatively. Computer science focuses on how to design, build, and effectively use the computers and systems that we interact with every day — from the iPhones in our hands to the complex databases in our banks and hospitals and to the self-driving cars of the future. Because computer technology powers the most essential functions of business, industry, government and entertainment, computer scientists have tremendous opportunities for growth and exploration.

The Bachelor of Science in Computer Science is a rigorous program that not only covers fundamental computer science subjects - such as object-oriented programming, computer architecture, algorithms, and operating systems – but provides a wide variety of elective courses, spanning artificial intelligence, game programming, natural language processing, information visualization, security and privacy, computer networking, machine learning, and database design. Students are actively encouraged to pursue research with NYU Shanghai computer science professors, all of whom are renown in their respective fields. Students are involved in an increasing number of interdisciplinary initiatives across the university, including the Center for Data Science and Artificial Intelligence and the Neuroscience Research Institute.

Computer science graduates have a myriad of career paths, including creating products for major high-tech companies such as Google, Tencent, Microsoft, founding or joining a high-tech startup, applying computer science savoir-faire in the public sector such as healthcare, law enforcement, or transportation, or going on to do cutting-edge research in a Ph.D. program. Household names such as Bill Gates, Mark Zuckerberg, Larry Page, Melisa Myers, Robin Li, and Kai-Fu Lee all began in computer science.

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
Core Courses		
Social and Cultural Foundations		
CCSF-SHU 101L	Global Perspectives on Society	4
Interdisciplinary Perspectives on China (Two Courses)		8
Writing		
WRIT-SHU 102	Writing as Inquiry	4
WRIT-SHU 201	Perspectives on the Humanities	4
Language		
Language Courses		8-16
Mathematics		
MATH-SHU 131	Calculus	4
Algorithmic Thinking		
Algorithmic Thinking Requirement Fulfilled by Major Coursework		
Science		
Experimental Discovery in the Natural World		4
Science, Technology, and Society		4
Major Requirements		
Required Major Courses		
CSCI-SHU 101	Introduction to Computer and Data Science	4
CSCI-SHU 210	Data Structures	4
CSCI-SHU 215	Operating Systems	4
CSCI-SHU 220	Algorithms	4
CSCI-SHU 2314	Discrete Mathematics	4
CSCI-SHU 420	Computer Science Senior Project	4
Select one of the following:		4
MATH-SHU 235	Probability and Statistics	
MATH-SHU 238	Honors Theory of Probability	
BUSF-SHU 101	Statistics for Business and Economics	
Select one of the following:		4
CENG-SHU 202	Computer Architecture	
CSCI-UA 201	Computer Systems Org	
CSCI-SHU 350	Embedded Computer Systems	
Computer Science Electives		
Select four of the Computer Science Electives listed below		16
Other Elective Credits		**32-40**
Total Credits		**128**

Computer Science Electives

Code	Title	Credits
BUSF-SHU 310	Data Science for Social and Information Networks	4
CENG-SHU 201	Digital Logic	4
CSCI-SHU 188	Introduction to Computer Music	4
CSCI-SHU 200	Topics in Human-Computer Interaction	4
CSCI-SHU 205	Topics in Computer Science	4
CSCI-SHU 213	Databases	4
CSCI-SHU 222	Introduction to Game Programming	4
CSCI-SHU 254	Distributed Systems	4
CSCI-SHU 308	Computer Networking	4
CSCI-SHU 311	Functional Programming	4
CSCI-SHU 350	Embedded Computer Systems	4
CSCI-SHU 360	Machine Learning	4
CSCI-SHU 361	Computer Security	4
CSCI-SHU 370	Object-Oriented Programming	4
CSCI-SHU 375	Reinforcement Learning	4
CSCI-SHU 376	Natural Language Processing	4
CSCI-SHU 378	Introduction to Cryptography	4
CSCI-SHU 381	Recommendation Systems	4
CSCI-SHU 410	Software Engineering	4
CSCI-SHU 997	Computer Science Independent Study	2-4
DATS-SHU 200	Topics in Machine Learning	4
DATS-SHU 235	Information Visualization	4

DATS-SHU 240	Introduction to Optimization and Mathematical Programming	4
DATS-SHU 369	Machine Learning with Graphs	4
DATS-SHU 377	Computer Vision	4

DATS-SHU 200 Topics in Machine Learning includes topics in:

- Deep Learning
- Optimatisation for Data Science and Machine Learning

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
CCSF-SHU 101L	Global Perspectives on Society	4
MATH-SHU 131	Calculus	4
CSCI-SHU 11	Introduction to Computer Programming (Core Class)	4
Chinese or EAP		4
	Credits	**16**
2nd Semester/Term		
WRIT-SHU 101	Writing as Inquiry: WI	4
Core Class		4
CSCI-SHU 101	Introduction to Computer and Data Science	4
Chinese or EAP		4
	Credits	**16**
3rd Semester/Term		
WRIT-SHU 201	Perspectives on the Humanities	4
CSCI-SHU 210	Data Structures	4
CSCI-SHU 2314	Discrete Mathematics	4
Chinese or Core Course		4
	Credits	**16**
4th Semester/Term		
MATH-SHU 235	Probability and Statistics	4
CSCI-SHU 220	Algorithms	4
CENG-SHU 202	Computer Architecture	4
Chinese or Core Course		4
	Credits	**16**
5th Semester/Term		
Core Course or General Elective		4
Computer Science Elective		4
Computer Science Elective		4
General Elective		4
	Credits	**16**
6th Semester/Term		
Core Course or General Elective		4
Computer Science Elective		4
Computer Science Elective		4
General Elective		4
	Credits	**16**
7th Semester/Term		
CSCI-SHU 215	Operating Systems	4
CSCI-SHU 420	Computer Science Senior Project	4
General Elective		4
General Elective		4
	Credits	**16**
8th Semester/Term		
General Elective		4
General Elective		4
General Elective		4
General Elective		4
	Credits	**16**
	Total Credits	**128**

Learning Outcomes

Upon successful completion of this program, students will:

1. Have an understanding of the fundamental technical subject areas associated with computer science.
2. Be able to incorporate knowledge of mathematics, computer science and engineering to solve technical problems.
3. Have the ability to communicate and function effectively in an interdisciplinary team environment.
4. Be effective life-long learners including demonstrating professional and ethical responsibilities.

Policies

Core Language Requirement

Students who did not attend a Chinese-medium high school fulfill the Core language requirement by demonstrating proficiency of the Chinese language through the Intermediate level. Chinese speakers who did not attend an English-medium high school fulfill the Core language requirement through completion of EAP-SHU 100 English for Academic Purposes I and EAP-SHU 101 English for Academic Purposes II . Additional information can be found on the NYU Shanghai Core Curriculum page (https://bulletins.nyu.edu/undergraduate/shanghai/core-curriculum/#text).

Interdisciplinary CS Elective

BUSF-SHU 310 Data Science for Social and Information Networks is considered as an “Interdisciplinary” CS elective. A maximum of one “interdisciplinary” CS elective class could be used to fulfill the four CS elective requirements. Please contact your advisor for more information.

Prerequisite Courses for Declaring a Major

Final grade of C/current semester midterm grade of B or higher in Introduction to Computer Programming OR Introduction to Computer and Data Science + Calculus.

Major Policies

Computer Science majors are not able to double major in Data Science.

NYU Policies

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

NYU Shanghai Policies

Additional academic policies can be found on the NYU Shanghai Academic Policies page (https://bulletins.nyu.edu/undergraduate/shanghai/academic-policies/).