

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 know-how in the public sector such as healthcare, law enforcement, or transportation, or going on to do cutting-edge research in a Ph.D. program.

REQUIREMENTS FOR THE MAJOR

Required Major Courses

- CSCI-SHU 101 Introduction to Computer and Data Science (*prereq: Placement test or CSCI-SHU 11 Intro to Computer Programming*)
- MATH-SHU 235 Probability and Statistics **OR**
MATH-SHU 238 Honors Theory of Probability **OR**
BUSF-SHU 101 Statistics for Business and Economics
- CENG-SHU 202 Computer Architecture (*prereq: CSCI-SHU 11 Intro to Computer Programming or CSCI-SHU 101 Intro to Computer and Data Science*) **OR**
CSCI-UA 201 Computer Systems Organization **OR**
CSCI-SHU 350 Embedded Computer Systems
- CSCI-SHU 210 Data Structures (*prereq: CSCI-SHU 101 Intro to Computer and Data Science or A- or above in CSCI-SHU 11 Intro to Computer Programming*)
- CSCI-SHU 215 Operating Systems (*prereq: CENG-SHU 202 Computer Architecture or CSCI-UA 201 Computer Systems Organization*)
- CSCI-SHU 220 Algorithms (*prereq: CSCI-SHU 210 Data Structures; CSCI-SHU 2314 Discrete Math or MATH-SHU 140 Linear Algebra or MATH-SHU 141 Honors Linear Algebra I or MATH-SHU 201 Honors Calculus*)
- CSCI-SHU 2314 Discrete Mathematics (*co-requisite or prereq: MATH-SHU 121 Calculus I*)
- CSCI-SHU 420 Computer Science Senior Project (*ONLY offered in the Fall*)

Computer Science Electives - Choose Four

Note: The courses listed below are not an exhaustive list. In particular, most of the CS elective courses at Tandon, College of Arts and Sciences, or Abu Dhabi can be used as NYU Shanghai CS electives. If you would like to see if a course not listed below can count as an elective, please contact your advisor to have the course reviewed.

- CENG-SHU 201 Digital Logic
- DATS-SHU 235 Information Visualization
- DATS-SHU 240 Introduction to Optimization and Mathematical Programming
- DATS-SHU 377 Computer Vision
- CSCI-SHU 188 Introduction to Computer Music
- CSCI-SHU 213 Databases
- CSCI-SHU 222 Introduction to Game Programming
- CSCI-SHU 254 Distributed Systems
- CSCI-SHU 308 Computer Networking
- CSCI-SHU 311 Functional Programming
- CSCI-SHU 350 Embedded Computer Systems
- CSCI-SHU 360 Machine Learning
- CSCI-SHU 375 Reinforcement Learning
- CSCI-SHU 376 Natural Language Processing
- CSCI-SHU 378 Introduction to Cryptography
- CSCI-SHU 381 Recommendation Systems
- CSCI-SHU 410 Software Engineering
- *INTM-SHU 231 Developing Web
- *BUSF-SHU 310 Data Science for Social and Information Networks

**Courses considered as "interdisciplinary/soft" CS electives. A maximum of one "interdisciplinary/soft" CS elective class could be used to fulfill the four CS elective requirements. Please contact your advisor for more information.*

General Electives

General Elective courses to meet 128 credit requirements.

Footnotes:

- 1) Not every course listed is taught every semester, and in any given semester other courses may be offered that fulfill these requirements. Requirements may be met through equivalent courses in NYU's global network with prior approval. 3-credit versions of courses can generally substitute for a full 4-credit course requirement. A 2-credit course with a similar title or content will not by itself meet the requirement of the named course.

- 2) The Computer Science major students are not able to double major in Data Science or Computer Systems Engineering.
- 3) The program is formed by four components: (1) core requirements, (2) required major courses, (3) major electives, and (4) general electives.
- 4) For core requirements see “Core Curriculum” section.

Computer Science Minor (For details see “Requirements for Minors” section)

Computer Science Program Learning Outcomes

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

COMPUTER SCIENCE

SAMPLE SCHEDULE 1

This is just one example of how a student could organize their courses if pursuing a CS major. It assumes a student begins taking CS major courses in the first year. Sample Schedule 2 offers an alternate plan that begins in the second year. Students may propose alternative schedules to their advisors as well.

1st Semester, Fall	Credits
Global Perspectives on Society	4
Core Course (Calculus)	4
Intro to Computer Programming	4
Chinese or EAP, Core Course, or General Elective	4
Credits	16

2nd Semester, Spring	Credits
Writing as Inquiry	4
Core Course	4
Introduction to Computer and Data Science or Data Structures	4
Chinese or EAP, Core Course, or General Elective	4
Credits	16

3rd Semester, Fall	Credits
Perspectives on the Humanities	4
Data Structures or Computer Science Elective	4
Discrete Mathematics	4
Core Course, General Elective, or Chinese	4
Credits	16

4th Semester, Spring	Credits
Probability and Statistics or alternate statistics course	4
Algorithms	4
Computer Architecture	4
Core Course, General Elective, or Chinese	4
Credits	16

5th Semester, Fall	Credits
Core Course or General Elective	4
Computer Science Elective	4
Computer Science Elective	4
General Elective	4
Credits	16

6th Semester, Spring	Credits
Core Course or General Elective	4
Computer Science Elective	4
Computer Science Elective	4
General Elective	4
Credits	16

7th Semester, Fall	Credits
Operating Systems	4
Computer Science Elective	4
Senior Project (ONLY offered every Fall)	4
General Elective	4
Credits	16

8th Semester, Spring	Credits
General Elective	4
General Elective	4
General Elective	4
General Elective	4
Credits	16

Total Credits: 128

COMPUTER SCIENCE

SAMPLE SCHEDULE 2

1st Semester, Fall

Credits

Global Perspectives on Society	4
Core Course (Calculus)	4
Core Class	4
Chinese or EAP, Core Course, or General Elective	4
Credits	16

2nd Semester, Spring

Credits

Writing as Inquiry	4
Core Course	4
Core Course or General Elective	4
Chinese or EAP, Core Course, or General Elective	4
Credits	16

3rd Semester, Fall

Credits

Perspectives on the Humanities	4
Intro to Computer Programming	4
Discrete Mathematics	4
Core Course, General Elective, or Chinese	4
Credits	16

4th Semester, Spring

Credits

Computer Science Elective	4
Introduction to Computer and Data Science or Data Structures	4
Computer Architecture	4
Core Course, General Elective, or Chinese	4
Credits	16

5th Semester, Fall

Credits

Data Structures or Computer Science Elective	4
Probability and Statistics or alternate statistics course	4
Computer Science Elective	4
General Elective	4
Credits	16

6th Semester, Spring

Credits

Algorithms	4
Computer Science Elective	4
General Elective	4
General Elective	4
Credits	16

7th Semester, Fall

Credits

Senior Project (ONLY offered every Fall)	4
Operating Systems	4
General Elective	4
General Elective	4
Credits	16

8th Semester, Spring

Credits

Core Course	4
Computer Science Elective	4
General Elective	4
General Elective	4
Credits	16

Total Credits: 128