

# COMPUTER SYSTEMS ENGINEERING (BS)

CIP: 14.0901

## Program Description

Engineering challenges of the 21st century are varied, complex, and cross-disciplinary. Ranging from the nano-scale to mega-projects, they are characterized by sustainability concerns, environmental and energy constraints, global sourcing, and humanitarian goals. In the face of global competition, dwindling natural resources and the complexity of societal needs, the leaders of technological enterprises will be those who can innovate, are inventive and entrepreneurial, and understand how technology is integrated within society.

Computer Systems Engineering at NYU Shanghai is designed to create technological leaders with a global perspective, a broad education, and the capacity to think creatively. Students enjoy a learning environment conducive to creativity which is at the heart of tomorrow's technological innovations and enterprises. Today the products of computer engineering touch nearly every part of our lives. They let us chat with friends via webcams, send emails from cell phones, and withdraw cash from ATMs. But laptops and information networks aren't the only products computer engineers develop; they reconstruct genomes, design robots, and develop software to make businesses more efficient.

## 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
<b>Core Courses</b>		
<i>Social and Cultural Foundations</i>		
CCSF-SHU 101L	Global Perspectives on Society	4
Interdisciplinary Perspectives on China (Two Courses)		8
<i>Writing</i>		
WRIT-SHU 102	Writing as Inquiry	4
WRIT-SHU 201	Perspectives on the Humanities	4
<i>Language<sup>1</sup></i>		
Language Courses		8-16
<i>Mathematics</i>		
MATH-SHU 131	Calculus	4
<i>Algorithmic Thinking</i>		
Algorithm Thinking Requirement Fulfilled by Major Coursework		
<i>Science</i>		
PHYS-SHU 11	General Physics I	3
or PHYS-SHU 91	Foundations of Physics I Honors	
PHYS-SHU 12	General Physics II	3
or PHYS-SHU 93	Foundations of Physics II Honors	

PHYS-SHU 94 Foundations of Physics Lab II 2

### Major Requirements

#### Required Courses

CENG-SHU 201	Digital Logic	4
CENG-SHU 202	Computer Architecture	4
or CSCI-UA 201	Computer Systems Org	
CSCI-SHU 101	Introduction to Computer and Data Science	4
CSCI-SHU 210	Data Structures	4
CSCI-SHU 350	Embedded Computer Systems	4
CSCI-SHU 2314	Discrete Mathematics	4
EENG-SHU 251	Circuits	4
EENG-SHU 400	Senior Capstone Design Project I	4
MATH-SHU 151	Multivariable Calculus	4
MATH-SHU 235	Probability and Statistics	4
or MATH-SHU 238	Honors Theory of Probability	
MATH-SHU 265	Linear Algebra and Differential Equation	4
or MATH-SHU 140	Linear Algebra	
or MATH-SHU 160	Networks and Dynamics	

#### Major Electives

Select two of the following:		8
CSCI-SHU 213	Databases	
CSCI-SHU 215	Operating Systems	
CSCI-SHU 254	Distributed Systems	
CSCI-SHU 308	Computer Networking	
CSCI-SHU 361	Computer Security	
CS-UY 3393	UNIX System Programming	
CS-UY 3933	NETWORK SECURITY	
ECE-UY 3114	Fundamentals of Electronics I	4
ECE-UY 3193	Introduction to Very Large Scale Integrated Circuits	
ROB-UY 2004	ROBOTIC MANIPULATION AND LOCOMOTION	

### Electives

Other Elective Credits 32

**Total Credits 128**

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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>).

## Sample Plan of Study

Course	Title	Credits
<b>1st Semester/Term</b>		
CCSF-SHU 101L	Global Perspectives on Society	4
MATH-SHU 131	Calculus	4

## 2 Computer Systems Engineering (BS)

CSCI-SHU 11	Introduction to Computer Programming	4
Chinese or EAP		4
<b>Credits</b>		<b>16</b>
<b>2nd Semester/Term</b>		
WRIT-SHU 102	Writing as Inquiry	4
CSCI-SHU 101	Introduction to Computer and Data Science	4
MATH-SHU 151	Multivariable Calculus	4
Chinese or EAP		4
<b>Credits</b>		<b>16</b>
<b>3rd Semester/Term</b>		
WRIT-SHU 201	Perspectives on the Humanities	4
CENG-SHU 201	Digital Logic	4
PHYS-SHU 11	General Physics I	3
or PHYS-SHU 91	or Foundations of Physics I Honors	
Chinese or Core Course		4
<b>Credits</b>		<b>15</b>
<b>4th Semester/Term</b>		
CSCI-SHU 210	Data Structures	4
EENG-SHU 251	Circuits	4
PHYS-SHU 12	General Physics II	3
or PHYS-SHU 93	or Foundations of Physics II Honors	
PHYS-SHU 94	Foundations of Physics Lab II	2
Chinese or Core Course		4
<b>Credits</b>		<b>17</b>
<b>5th Semester/Term</b>		
CSCI-SHU 2314	Discrete Mathematics	4
CENG-SHU 202	Computer Architecture	4
MATH-SHU 235	Probability and Statistics	4
or MATH-SHU 238	or Honors Theory of Probability	
Computer Systems Engineering Elective		4
<b>Credits</b>		<b>16</b>
<b>6th Semester/Term</b>		
Computer Systems Engineering Elective		4
MATH-SHU 265	Linear Algebra and Differential Equation (or alternative course)	4
CSCI-SHU 350	Embedded Computer Systems	4
General Elective		4
<b>Credits</b>		<b>16</b>
<b>7th Semester/Term</b>		
General Elective		4
Core or General Elective		4
Core or General Elective		4
General Elective		4
<b>Credits</b>		<b>16</b>
<b>8th Semester/Term</b>		
Core or General Elective		4
Senior Project		4
General Elective		4
General Elective		4
<b>Credits</b>		<b>16</b>
<b>Total Credits</b>		<b>128</b>

- Be effective life-long learners including demonstrating professional and ethical responsibilities.

## Policies

### 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/>).

## Learning Outcomes

Upon successful completion of this program, students will:

- Have an understanding of the fundamental technical subject areas associated with engineering.
- Be able to incorporate knowledge of mathematics, computer science and engineering to solve technical problems.
- Have the ability to communicate and function effectively in an interdisciplinary team environment.