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
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		
Algorithm Thinking Requirement Fulfilled by Major Coursework		
Science		
PHYS-SHU 11	General Physics I	3
PHYS-SHU 12	General Physics II	3
PHYS-SHU 94	Foundations of Physics Lab II	2
Major Requirements		
Required Courses		
CENG-SHU 201	Digital Logic	4
CENG-SHU 202 or CSCI-UA 201	Computer Architecture Computer Systems Org	4
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 or MATH-SHU 238	Probability and Statistics Honors Theory of Probability	4
MATH-SHU 265 or MATH-SHU 140 or MATH-SHU 160	Linear Algebra and Differential Equation Linear Algebra Networks and Dynamics	4
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	
ECE-UY 3193	Introduction to Very Large Scale Integrated Circuits	
ROB-UY 2004	Robotic Manipulation and Locomotion	
Electives		
Other Elective Credits		36
Total Credits		**128**

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	4
Chinese or EAP		4
	Credits	**16**
2nd Semester/Term		
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
	Credits	**16**
3rd Semester/Term		
WRIT-SHU 201	Perspectives on the Humanities	4
CENG-SHU 201	Digital Logic	4
PHYS-SHU 11 or PHYS-SHU 91	General Physics I or Foundations of Physics I Honors	3
Chinese or Core Course		4
	Credits	**15**

4th Semester/Term		
CSCI-SHU 210	Data Structures	4
EENG-SHU 251	Circuits	4
PHYS-SHU 12 or PHYS-SHU 93	General Physics II or Foundations of Physics II Honors	3
PHYS-SHU 94	Foundations of Physics Lab II	2
Chinese or Core Course		4
	Credits	**17**
5th Semester/Term		
CSCI-SHU 2314	Discrete Mathematics	4
CENG-SHU 202	Computer Architecture	4
MATH-SHU 235 or MATH-SHU 238	Probability and Statistics or Honors Theory of Probability	4
Computer Systems Engineering Elective		4
	Credits	**16**
6th Semester/Term		
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
	Credits	**16**
7th Semester/Term		
General Elective		4
Senior Project		4
Core or General Elective		4
General Elective		4
	Credits	**16**
8th Semester/Term		
Core or General Elective		4
Core or 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 engineering.
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

Program Policies

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).

Prerequisite Courses for Declaring a Major

Final grade of C/ current semester midterm grade of B or higher in Calculus + Digital Logic OR Circuits.

Math and Computer Systems Engineering (CSE) Double Major Guidelines

Students who are interested in pursuing a Computer Systems Engineering major along with a math major have the option to double-count more than two courses between the majors. To complete both majors successfully, students would need to complete the course requirements for both majors. However, the following courses are allowed to be double-counted toward both majors:

- MATH-SHU 235 Probability and Statistics **OR** MATH-SHU 238 Honors Theory of Probability
- MATH-SHU 140 Linear Algebra **OR** MATH-SHU 265 Linear Algebra and Differential Equations **OR** MATH-SHU 160 Networks and Dynamics
- CSCI-SHU 2314 Discrete Mathematics
- MATH-SHU 151 Multivariable Calculus

Honor Math and Computer Systems Engineering (CSE) Double Major Guidelines

Students who are interested in pursuing a Computer Systems Engineering major along with an honor math major have the option to double-count more than two courses between the majors. To complete both majors successfully, students would need to complete the course requirements for both majors. However, the following courses are allowed to be double-counted toward both majors:

- MATH-SHU 141 Honors Linear Algebra I
- MATH-SHU 238 Honors Theory of Probability
- MATH-SHU 329 Honors Analysis II
- MATH-SHU 348 Honors Algebra I

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/).