

ELECTRICAL AND SYSTEMS ENGINEERING (BS)

CIP: 14.1001

Program Description

Electrical and Systems Engineering at NYU Shanghai is designed to create technological leaders with a global perspective, a broad education, and the capacity to think creatively. Innovations by electrical engineers touch every aspect of modern life, from the subway systems beneath our cities to the HD televisions on our walls to the smartphones in our pockets. But this process of innovation is never complete, and new challenges await tomorrow's electrical engineers.

The Electrical and Systems Engineering program draws upon courses across an array of disciplines. The liberal arts core provides the intellectual breadth, a "license to learn," preparing students to thrive in a multicultural globalized world and to learn and adapt quickly in areas that evolve with ever-increasing swiftness. Students not only gain a firm grounding across various science and engineering fields that underscore the technical component of an engineering education, but also draw upon courses to develop an understanding of cultural, political, economic, environmental, and public safety considerations. These studies often include hands-on coursework in state-of-the-art laboratories. In addition, the variety of specialized subjects students can investigate through elective coursework — from wireless communication to smart grid power systems — ensures a highly flexible education suited to individual interests.

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		
<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</i>		
Language Courses		8-16
<i>Mathematics</i>		
MATH-SHU 131	Calculus	4
<i>Algorithmic Thinking</i>		
Algorithmic Thinking Requirement Fulfilled by Major Coursework		
<i>Science</i>		
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		
CENG-SHU 201	Digital Logic	4
CSCI-SHU 11 or CSCI-SHU 101	Introduction to Computer Programming Introduction to Computer and Data Science	4
EENG-SHU 251	Circuits	4
EENG-SHU 400	Senior Capstone Design Project I	4
ECE-UY 3054 or ENGR-UH 3610	Signals and Systems ¹ Signals and Systems	4
ECE-UY 3114 or ENGR-UH 3611	Fundamentals of Electronics I ¹ Electronics	4
ECE-UY 3604 or PHYS-UH 2115	Electromagnetic Waves ¹ Electricity and Magnetism for Engineers	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

Electives

Select two of the following:		8
ECE-UY 3404	Fundamentals of Communication Theory ¹	
ECE-UY 3064	Feedback Control (offered in New York) ¹	
ECE-UY 3124	Fundamentals Of Electronics II ¹	
ECE-UY 3824	Electric Energy Conversion Systems ¹	
Select two of the following:		8
CSCI-SHU 308	Computer Networking	
CSCI-SHU 350	Embedded Computer Systems	
ECE-UY 3193	Introduction to Very Large Scale Integrated Circuits ¹	
ECE-UY 3404	Fundamentals of Communication Theory ¹	
ROB-UY 2004	Robotic Manipulation and Locomotion ¹	

Other Elective Credits	32-40
Total Credits	128

¹ Courses will not be offered in Shanghai. Students are required to complete these required major courses from NYU New York or NYU Abu Dhabi.

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 or CSCI-SHU 101	Introduction to Computer Programming or Introduction to Computer and Data Science	4
Chinese or EAP		4
Credits		16

2nd Semester/Term		
WRIT-SHU 102	Writing as Inquiry	4
MATH-SHU 151	Multivariable Calculus	4
MATH-SHU 265	Linear Algebra and Differential Equation	4
Chinese or EAP		4
Credits		16
3rd Semester/Term		
WRIT-SHU 201	Perspectives on the Humanities	4
PHYS-SHU 11 or PHYS-SHU 91	General Physics I or Foundations of Physics I Honors	3
CENG-SHU 201	Digital Logic	4
Chinese or Core Course		4
Credits		15
4th Semester/Term		
Core or General Elective		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
EENG-SHU 251	Circuits	4
Chinese or Core Course		4
Credits		17
5th Semester/Term		
Core or General Elective		4
ENGR-UH 3611	Electronics	4
ENGR-UH 3610	Signals and Systems	4
ECE-UY 3604	Electromagnetic Waves	4
Credits		16
6th Semester/Term		
Electrical and Systems Engineering Elective		4
Electrical and Systems Engineering Elective		4
Electrical and Systems Engineering Elective		4
Electrical and Systems Engineering Elective		4
Credits		16
7th Semester/Term		
MATH-SHU 235 or MATH-SHU 238	Probability and Statistics or Honors Theory of Probability	4
EENG-SHU 400	Senior Capstone Design Project I	4
General Elective		4
General Elective		4
Credits		16
8th Semester/Term		
Core or General Elective		4
General Elective		4
General Elective		4
General Elective		4
Credits		16
Total Credits		128

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.

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 the program, students will:

1. Have an understanding of the fundamental technical subject areas associated with engineering.
2. Be able to incorporate knowledge of mathematics, 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.