Program of Computer Science and Technology for International Students (2019)

I. Introduction

Computer Science and Technology is an area with great market demand and potential, in an acute shortage of fully developed talents. With the rapid development of data, information, and AI technologies, which boost modern enterprises, the shortage will grow exponentially. Predictably, those high-quality, innovative, interdisciplinary IT talents will be highly appreciated by the market as the up-to-date computer technology grows intensive, ubiquitous, interdisciplinary, and competitive.

II. Objectives and Learning Outcomes

This major will cultivate high-quality computer science and technology talents with solid theoretical foundations, modern system design principles, effective research and exploration methods, and useful English and computer application skills, who are competent to the positions from the design of computer systems to the development of computer applications. The graduates can continue the study in pursue of higher degrees or work in IT related education, management, scientific research and industrial applications in universities, research institutes, administrations, public sectors and industries.

III. Study Length and Graduation Requirements

Study length: 4 years

Degree conferred: Bachelor of Engineering

The minimum credit requirement for graduation: 131 credits (not including English courses);

Category	Module	Minimum Credit Requirement
General Education (GE) Required Courses (48 creidts)	Science	28
	Physical Education	4
	Chinese Languages & Culture	16
General Education (GE) Elective Courses (12 creidts)	Humanities	4
	Social Sciences	4
	Arts	2
	Science	2
Major Course (71 creidts)	Major Foundational Courses	21
	Major Core Courses	24
	Major Elective Courses	16
	Internship and Undergraduate Thesis / Projects	10
Total (not including English courses)		131

IV. Discipline

Computer Science and Technology

V. Main Courses

Data Structures and Algorithm Analysis, Digital Logic, Probability and Statistics, Principles of Database Systems, Discrete Mathematics, Computer Organization, Algorithm Design and Analysis, Embedded System and Microcomputer Principle, Artificial Intelligence, Computer Networks, Object-oriented Analysis and Design, Operating Systems, Software Engineering and so on.

VI. Practice-Based Courses

See the table 3 of Major Course Arrangement.

VII. Pre-requisites for Major Declaration

Major Declaration Time	Course Code	Course Name	Prerequisite
Declare major at the end of First Year	MA101B	Calculus I A	
	MA102B	Calculus II A	MA101B
	MA107A	Linear Algebra A	
	PHY103B	General Physics B (I)	
	PHY105B	General Physics B (II)	PHY103B
	CS102A	Introduction to Computer Programming A	
	BIO102B	Introduction to Life Science	
	PHY104B	Experiments of Fundamental Physics	
Remarks: In addition to the above 8 courses, a written test and interview are required.			
Declare major at the end of Second Year	MA101B	Calculus I A	
	MA102B	Calculus II A	MA101B
	MA107A	Linear Algebra A	
	PHY103B	General Physics B (I)	
	PHY105B	General Physics B (II)	PHY103B
	CS102A	Introduction to Computer Programming A	
	BIO102B	Introduction to Life Science	
	PHY104B	Experiments of Fundamental Physics	
	CS203	Data Structures and Algorithm Analysis	CS102A
	CS207	Digital Logic	
	MA212	Probability and Statistics	MA102a or MA102B
	CS307	Principles of Database Systems	CS102A
	CS201	Discrete Mathematics	MA102B, MA107A
	CS202	Computer Organization	CS207
	CS208	Algorithm Design and Analysis	CS102A, CS203

VIII. Requirements for GE Required Courses

(I) Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept
MA101B	Calculus I A	4		4	Spr/Fall	B/E	NA	MATH
MA102B	Calculus II A	4		4	Spr/Fall	B/E	MA101B	MATH
MA107A	Linear Algebra A	4		4	Spr/Fall	B/E	NA	MATH
PHY103B	General Physics B (I)	4		4	Spr/Fall	B/E	NA	PHY
PHY105B	General Physics B (II)	4		4	Spr/Fall	B/E	PHY103B	PHY
CS102A	Introduction to Computer Programming A	3		4	Spr/Fall	B/E	NA	CSE
BIO102B	Introduction to Life Science	3		3	Spr/Fall	B/E	NA	BIO
PHY104B	Experiments of Fundamental Physics	2		4	Spr/Fall	B/E	NA	PHY
Total		28		31				

(II) Physical Education

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept
GE131	Physical Education I	1		2	1/Fall	C	NA	PE Center
GE132	Physical Education II	1		2	1/Spr	C	NA	
GE231	Physical Education III	1		2	2/Fall	C	NA	
GE232	Physical Education IV	1		2	2/Spr	C	NA	
Total		4		8				

(III) Chinese Languages & Culture

Course Code	Course Name	Credit	Hours/week	Term	Language Instruction	Prerequisite	Dept
CLE008	Elementary Chinese I	2	4	1/Fall	B	NA	CLE
CLE009	Elementary Chinese II	2	4	1/Spr	B	CLE008	
CLE027	Intermediate Chinese I	2	4	2/Fall	B	CLE009	
CLE028	Intermediate Chinese II	2	4	2/Spr	B	CLE027	

CLE031	Advanced Chinese I	2	4	3/Fall	B	CLE028	
CLE032	Advanced Chinese II	2	4	3/Spr	B	CLE031	
CLE033	Chinese Culture	2	2	Spr/Fall	B/E	NA	CLE/ HUM/ SSC
CLE034	Chinese History	2	2	Spr/Fall	B/E	NA	
Total		16	28				

(IV) English Language

All students are required to undertake the English Placement Test before selecting courses, based on which students will be assigned to 3 levels to be ready for the courses with English as the instruction language.

SUSTech English III, English for Academic Purposes are required for Level A.

SUTech English II, SUSTech English III, English for Academic Purposes for Level B.

SUSTech English I, SUSTech English II, SUSTech English III, English for Academic for Level C.

Course Code	Course Name	Credit	Hours/week	Instruction Language	Prerequisite	Dept
CLE021	SUSTech English I	4	4	E	NA	CLE
CLE022	SUSTech English II	4	4	E	CLE021	
CLE023	SUSTech English III	4	4	E	CLE022	
CLE030	English for Academic Purposes	2	2	E	CLE023	

IX. Requirements for GE Elective Courses

(I) Students are required to complete 4 credits for the Humanities Module and Social Sciences Module respectively, and 2 credits for the Music and Art Module. (Information about the available courses and the instruction language will be announced before the course selection session)

(II) Students are required to complete 2 credits for Science Module

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Language Instruction	Prerequisite	Dept
CH101B	General Chemistry B	3		3	Spr/Fall	B/E	NA	CHEM
EE104	Fundamentals of Electric Circuits	2		2	Spr	E	MA101B MA107A	EE
ME112	Introduction to Matlab	2	1	3	Spr	E	NA	MEE
ME232	Prolegomenon to Robotics	3		3	Spr	E	NA	MEE
CS103	Introduction to Artificial Intelligence	2		2	Fall	E	NA	CSE
Total		12	1	13				

X. Major Course Arrangement

Table 1: Major Required Course (Foundational and Core Courses)

Course Category	Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
Major Foundational Courses	CS203	Data Structures and Algorithm Analysis	3	1	4	Fall	2/Fall	E	CS102A	CSE
	CS207	Digital Logic	3	1	4	Fall	2/Fall	E	NA	CSE
	MA212	Probability and Statistics	3		3	Fall	2/Fall	E	MA102a or MA102B	MATH
	CS307	Principles of Database Systems	3	1	4	Fall	2/Fall	E	CS102A	CSE
	CS201	Discrete Mathematics	3		3	Fall /Spr	2/Spr	E	MA102B, MA107A	CSE
	CS202	Computer Organization	3	1	4	Spr	2/Spr	E	CS207	CSE
	CS208	Algorithm Design and Analysis	3	1	4	Spr	2/Spr	E	CS102A, CS203	CSE
	Total		21	5	26					
Major Core Courses	CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3/Fall	E	CS207	CSE
	CS303	Artificial Intelligence	3	1	4	Fall	3/Fall	E	CS102A, CS203, MA212	CSE
	CS305	Computer Networks	3	1	4	Fall	3/Fall	E	CS102A	CSE
	CS309	Object-oriented Analysis and Design	3	1	4	Fall	3/Fall	E	CS102A, CS203	CSE
	CS321	Group Projects I	2	2	4	Fall	3/Fall	E	NA	CSE
	CS317	Frontier Seminars in Computer Science and Technology I	1		1	Fall	3/Fall	E	NA	CSE
	CS302	Operating Systems	3	1	4	Spr	3/Spr	E	CS102A, CS203	CSE
	CS304	Software Engineering	3	1	4	Spr	3/Spr	E	CS102A, CS203	CSE
	CS326	Group Projects II	2	2	4	Spr	3/Spr	E	NA	CSE
	CS318	Frontier Seminars in Computer Science and Technology II	1		1	Spr	3/Spr	E	NA	CSE
	CS413	Group Projects III	2	2	4	Fall	4/Fall	E	NA	CSE

	CS415	Frontier Seminars in Computer Science and Technology III	1		1	Fall	4/Fall	E	NA	CSE
	Total		27	12	39					
	Remarks: The credit requirement for Major Core Courses is 24 credits. Students can choose to study one course of them (Embedded System and Microcomputer Principle, object-oriented Analysis and Design).									
Major Practice Courses	CS470	Industrial Practice	2							
	CS490	Undergraduate Thesis/Projects	8							
	Total		10							
	Remarks: Students who have completed Comprehensive Design Ⅰ & Ⅱ (COE491 & COE492) are not required to take Undergraduate Thesis/Projects (CS490)									

Table 2: Major Elective Courses

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
CS101A	Introduction to Computer Science A	2		2	Fall	1/Fall	E	NA	CSE
CS106	Introduction to Cognitive Science	2		2	Fall	1/Fall	E	NA	CSE
CS209A	Computer System Design and Applications A	3	1	4	Fall /Spr	1/Spr	E	CS102A or CS102B	CSE
EE205	Signals and Systems	3	1	4	Fall	2/Fall	E	MA101 B	EE
CS205	C/C++ Program Design	3	1	4	Fall /Spr	2/Fall	E	NA	CSE
MA309	Time Series Analysis	3		3	Fall	3/Fall	E	MA212 or MA204	MATH
MA305	Numerical Analysis	3		3	Fall	3/Fall	E	MA203a or MA213	MATH
EE323	Digital Signal Processing	3	1	4	Fall	3/Fall	E	EE205	EE
CS308	Computer Vision	3	1	4	Fall	3/Fall	E	CS102A ,CS203, MA102 B,MA10 7A	CSE
CS323	Compilers	3	1	4	Fall	3/Fall	E	CS102A or CS205, CS202	CSE
CS315	Computer Security	3	1	4	Fall	3/Fall	E	CS205	CSE
MA333	Introduction to Big Data Science	3		3	Spr	3/Spr	E	MA212 or MA215	MATH
EE326	Digital Image Processing	3	1	4	Spr	3/Spr	E	EE205	EE
CS306	Data Mining	3	1	4	Spr	3/Spr	E	CS203 or CS203B	CSE
CS324	Deep Learning	3	1	4	Spr	3/Spr	E	CS303	CSE
CS312	Computer Graphics	3	1	4	Spr	3/Spr	E	NA	CSE
CS314	Internet of Things	3	1	4	Spr	3/Spr	E	CS305	CSE
CS401	Intelligent Robotics	3	1	4	Spr	3/Spr	E	CS102, CS203, MA212	CSE
EE411	Information Theory and Coding	2		2	Fall	4/Fall	E	MA212	EE

CS403	Cryptography and Network Security	2		2	Fall	4/Fall	E	CS201, MA212, CS203	CSE
CS405	Machine Learning	3	1	4	Fall	4/Fall	E	MA212 MA107 A	CSE
CS407	Advanced Computer Networks and Big Data	3	1	4	Fall	4/Fall	E	CS305	CSE
CS409	Software Testing	3	1	4	Fall	4/Fall	E	CS304	CSE
CS419	Advanced Algorithms	3	1	4	Fall	4/Fall	E	CS208	CSE
CS421	Advanced Artificial Intelligence	3	1	4	Fall	4/Fall	E	CS303	CSE
CS408	Evolutionary Computation and Its Applications	3	1	4	Spr	4/Spr	E	CS303	CSE
CS406	Advanced Optimization Algorithms	3	1	4	Spr	4/Spr	E	CS419	CSE
CS402	Frontier Seminars in Computer Science and Technology IV	1		1	Spr	4/Spr	E	NA	CSE
Total		78	20	98					
Students are required to complete 16 credits for the Major Elective Courses.									

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credit	Lab Credits	Hours/week	Term	Advised term to take the course	Instruction language	Prerequisite	Dept.
CS209A	Computer System Design and Applications A	3	1	4	Spr	1/Spr	E	CS102A or CS102B	CSE
EE205	Signals and Systems	3	1	4	Fall	2/Fall	E	MA101B	EE
CS205	C/C++ Program Design	3	1	4	Fall /Spr	2/Fall	E	NA	CSE
CS203	Data Structures and Algorithm Analysis	3	1	4	Fall	2/Fall	E	CS102A	CSE
CS207	Digital Logic	3	1	4	Fall	2/Fall	E	NA	CSE
CS307	Principles of Database Systems	3	1	4	Fall	2/Fall	E	CS102	CSE
CS202	Computer Organization	3	1	4	Spr	2/Spr	E	CS207	CSE
CS208	Algorithm Design and Analysis	3	1	4	Spr	2/Spr	E	CS102A, CS203	CSE
EE323	Digital Signal Processing	3	1	4	Fall	3/Fall	E	EE205	EE
CS308	Computer Vision	3	1	4	Fall	3/Fall	E	CS102A CS203 MA102B MA107A	CSE
CS323	Compilers	3	1	4	Fall	3/Fall	E	CS102A or CS205, CS202	CSE
CS315	Computer Security	3	1	4	Fall	3/Fall	E	CS205	CSE
CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3/Fall	E	CS207	CSE
CS303	Artificial Intelligence	3	1	4	Fall	3/Fall	E	CS102A CS203 MA212	CSE
CS305	Computer Networks	3	1	4	Fall	3/Fall	E	CS102A	CSE
CS309	Object-oriented Analysis and Design	3	1	4	Fall	3/Fall	E	CS102A, CS203	CSE
CS321	Group Projects I	2	2	4	Fall	3/Fall	E	NA	CSE
CS302	Operating Systems	3	1	4	Spr	3/Spr	E	CS102A, CS203	CSE
CS304	Software Engineering	3	1	4	Spr	3/Spr	E	CS102A, CS203	CSE
CS326	Group Projects II	2	2	4	Spr	3/Spr	E	NA	CSE
CS306	Data Mining	3	1	4	Spr	3/Spr	E	CS203 or CS203B	CSE
CS324	Deep Learning	3	1	4	Spr	3/Spr	E	CS303	CSE
CS312	Computer Graphics	3	1	4	Spr	3/Spr	E	NA	CSE

CS314	Internet of Things	3	1	4	Spr	3/Spr	E	CS305	CSE
CS401	Intelligent Robotics	3	1	4	Spr	3/Spr	E	CS102A, CS203, MA212	CSE
EE326	Digital Image Processing	3	1	4	Spr	3/Spr	E	EE205	EE
CS413	Group Projects III	2	2	4	Fall	4/Fall	E	NA	CSE
CS405	Machine Learning	3	1	4	Fall	4/Fall	E	MA212, MA107A	CSE
CS407	Advanced Computer Networks and Big Data	3	1	4	Fall	4/Fall	E	CS305	CSE
CS409	Software Testing	3	1	4	Fall	4/Fall	E	CS304	CSE
CS419	Advanced Algorithms	3	1	4	Fall	4/Fall	E	CS208	CSE
CS421	Advanced Artificial Intelligence	3	1	4	Fall	4/Fall	E	CS303	CSE
CS408	Evolutionary Computation and Its Applications	3	1	4	Spr	4/Spr	E	CS303	CSE
CS406	Advanced Optimization Algorithms	3	1	4	Spr	4/Spr	E	CS419	CSE
CS470	Industrial Practice	2							
CS490	Undergraduate Thesis/Projects	8							
Total		109	37	136					

Table 4: Overview of Course Hours and Credits

Course Category	Total Course Hours	Total Credits	Credit Requirements	Percentage of the Total*
General Education (GE) Required Courses (not including English courses)			48	
General Education (GE) Elective Courses			12	
Major Foundational Courses	416	21	21	100%
Major Core Courses	624	27	24	88.89%
Major Elective Courses	1568	78	16	20.51%
Internship and Undergraduate Thesis/Projects		10	10	100%
Total (not including English courses)			131	

* Percentage of the total= Credit requirements of each line / Total credit requirements

Curriculum Structure of Computer Science and Technology Major

