Department of Computer Science and Engineering

Program of Computer Science and Technology

（2017 UG International Students）

I. Introduction

Computer Science is as a great developing potential major, seeing an acute shortage of advanced talents. With the rapid development of computer technology and the modernization of enterprises, the phenomenon will become more and more serious. The society urgently needs high-quality talents due to the intensive, permeability, interdisciplinary integration, technology innovation, and the fierce competition in the market in current and future periods of time.

II. Objectives

This major is aiming at cultivating talents who possess firm professional theory knowledge, mastering the frontier computer system design principle, corresponding research and exploitation ability, and capable of utilizing English and computer technology. After graduation, students can not only engage in research, exploitation, management, or teaching in computer science and technology field in corporations, scientific research institutes, universities, but also continue their postgraduate studies in Computer Science and Technology and related or interdisciplinary fields.

III. Program Length and Degree Requirement

Program length: Four years

Degree conferred: Bachelor of Engineering

The minimum credit requirement for graduation: 131.5 credits

IV. Discipline

Computer Science and Technology

V. Main Courses

Data Structures and Algorithm Analysis, Digital Logic, Probability and Statistics, Discrete Mathematics, Computer Organization Principle, Algorithm Design and Analysis, Database Principle, 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 Table 3

VII. Course Structure and Credit Requirements

General Education (GE） Required Courses: 50.5 credits

General Education (GE) Elective Courses: 10 credits

Major Foundational Courses: 21 credits

Major Core Courses: 21 credits

Major Elective Courses: 16 credits

Undergraduate Thesis/Projects: 8 credits

Advanced Computer Science Experiment: 3 credits

Industrial Practice: 2 credits

The minimum requirement credits for graduation: 131.5 credits

VIII. Requirement for GE Required Courses

Course Code	Course Name	Credits
MA101B	Calculus I A	4
MA102B	Calculus II A	4
MA103A	Linear Algebra I A	4
PHY103B	General Physics I B	4
PHY105B	General Physics II B	4
CH101-B	General Chemistry B	3
BIO102B	General Biology B (Introduction to Life Science)	3
CS102A	Introduction to Computer Programming A	3
PHY104	Experiment for Foundation of Physics	1.5

IX. Pre-requisites for Major Declaration

Course Code	Course Name	Notes
CS102A	Introduction to Computer Programming A	
CS203	Data Structures and Algorithm Analysis	
CS207	Digital Logic	
MA212	Probability and Statistics	
CS201	Discrete Mathematics	
CS202	Computer Organization Principle	
CS208	Algorithm Design and Analysis	
CS307	Database Principle	

X. Course Arrangement

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

Course Category	Course Code	Course Name	Credits	Lab Credits	Hours/Week	Terms	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	CS
	CS207	Digital Logic	3	1	4	Fall	2 / Fall	E	NA	CS
	MA212	Probability and Statistics	3		3	Fall	2 / Fall	E	MA102a or MA102B	MA
	CS201	Discrete Mathematics	3		3	Spr.	2 / Spr.	E	MA102B, MA103A	CS
	CS202	Computer Organization Principle	3	1	4	Spr.	2 / Spr.	E	CS207	CS
	CS208	Algorithm Design and Analysis	3	1	4	Spr.	2 / Spr.	E	CS102A, CS203	CS
	CS307	Database Principle	3	1	4	Spr.	2 / Spr.	E	NA	CS
	Total		**21**	**5**	**26**					
Major Core Courses	CS301	Embedded System and Microcomputer Principle	3	1	4	Fall	3 / Fall	E	CS207	CS
	CS303	Artificial Intelligence	3	1	4	Fall	3 / Fall	E	CS102A, CS203, MA212	CS
	CS305	Computer Networks	3	1	4	Fall	3 / Fall	E	CS102A	CS
	CS309	Object-oriented Analysis and Design	3	1	4	Fall	3 / Fall	E	CS102A, CS203	CS
	CS302	Operating Systems	3	1	4	Spr.	3 / Spr.	E	CS102A, CS203	CS
	CS304	Software Engineering	3	1	4	Spr.	3 / Spr.	E	CS309	CS
	CS317	Frontier Seminars in Computer Science and Technology I	1		1	Fall	3 / Fall	E	NA	CS
	CS318	Frontier Seminars in Computer Science and Technology II	1		1	Spr.	3 / Spr.	E	NA	CS
	CS415	Frontier Seminars in Computer Science and Technology III	1		1	Fall	4 / Fall	E	NA	CS
	Total		**21**	**6**	**27**					
CS319		Advanced Computer Science Experiment I	1	1						
CS322		Advanced Computer Science Experiment II	1	1						

CS417	Advanced Computer Science Experiment III	1	1						
CS470	Industrial Practice	2	2						
CS490	Undergraduate Thesis/Projects	8	8	16					
Total		**55**	**24**	**69**					

Table 2: Major Elective Courses

Course Code	Course Name	Credits	Lab Credits	Hours/Week	Terms	Advised term to take the course	Instruction language	Prerequisite	Dept.
CS101A	Introduction to Computer A	2		2	Fall	1 / Fall	E	NA	CS
CS209A	Computer System Design and Application A	3	1	4	Spr.	1 / Spr.	E	CS102A	CS
EE205	Signals and Systems	3	1	4	Fall	2 / Fall	E	NA	EE
CS205	C/C++ Programming Design	3	1	4	Fall/ Spr.	2 / Fall	E	NA	CS
CS204	Digital Media and Creative Programming	3	1	4	Spr.	2 / Spr.	E	CS102A	CS
MA206	Mathematical Modeling	3		3	Spr.	Spr.	E	MA201a or MA201b	MA
MA309	Time Series Analysis	3		3	Fall	3 / Fall	C	MA212 or MA204	MA
MA333	Introduction to Big Data Science	3		3	Fall	3 / Fall	E	NA	MA
MA305	Numerical analysis	3		3	Fall	3 / Fall	E	MA203a or MA213	MA
EE313	Wireless Communications	3	1	4	Fall	3 / Fall	E	EE206	EE
EE323	Digital Signal Processing	3	1	4	Fall	3 / Fall	E	EE205	EE
EE326	Digital Image Processing	3	1	4	Spr.	3 / Spr.	E	EE205	EE
EE332	Digital System Design	3	1	4	Spr.	3 / Spr.	E	EE202-17	EE
CS306	Data Mining	3	1	4	Spr.	3 / Spr.	E	CS203	CS
CS308	Computer Vision	3	1	4	Spr.	3 / Spr.	E	MA103A	CS
CS312	Computer Graphics	3	1	4	Spr.	3 / Spr.	E	CS102A, CS203	CS
CS314	Internet of Things	3	1	4	Spr.	3 / Spr.	E	CS309, CS305	CS
CS316	Parallel and Cloud Computing	3	1	4	Spr.	3 / Spr.	E	NA	CS
EE411	Information theory and coding	2		2	Fall	4 / Fall	E	MA212	EE
CS401	Intelligent Robots	3	1	4	Fall	4 / Fall	E	CS102A, CS203, MA212	CS
CS403	Cryptography and Network Security	2		2	Fall	4 / Fall	E	CS201, MA212, CS203	CS
CS405	Machine Learning	3	1	4	Fall	4 / Fall	E	MA212, MA103A	CS
CS407	Advanced Computer Networks and Big Data	3	1	4	Fall	4 / Fall	E	CS305	CS
CS419	Advanced Algorithms	3	1	4	Fall	4 / Fall	E	NA	CS
CS421	Advanced Artificial Intelligence	3	1	4	Fall	4 / Fall	E	CS303	CS
CS402	Frontier Seminars in Computer Science and Technology IV	1		1	Fall	4 / Fall	E	NA	CS
Total		**73**	**18**	**91**					

Table 3: Overview of Practice-Based Courses

Course Code	Course Name	Credit	Lab Credits	Hours/week	Terms	Advised term to take the course	Instruction language	Prerequisite	Dept.
CS209A	Computer system design and application A	3	1	4	Spr.	1 / Spr.	E	CS102A	CS
EE205	Signals and Systems	3	1	4	Fall	2 / Fall	E	NA	EE
CS205	C/C++ Programming Design	3	1	4	Fall/ Spr.	2 / Fall	E	NA	CS
CS203	Data Structures and Algorithm Analysis	3	1	4	Fall	2 / Fall	E	CS102A	CS
CS207	Digital Logic	3	1	4	Fall	2 / Fall	E	NA	CS
CS202	Computer Organization Principle	3	1	4	Spr.	2 / Spr.	E	CS207	CS
CS307	Database Principle	3	1	4	Spr.	2 / Spr.	E	NA	CS
CS204	Digital Media and Creative programming	3	1	4	Spr.	2 / Spr.	E	CS102A	CS
CS208	Algorithm Design and Analysis	3	1	4	Spr.	2 / Spr.	E	CS102A,CS203	CS
EE313	Wireless Communications	3	1	4	Fall	3 / Fall	E	EE206	EE
EE323	Digital Signal Processing	3	1	4	Fall	3 / Fall	E	EE205	EE
CS301	Embedded system and microcomputer principle	3	1	4	Fall	3 / Fall	E	CS207	CS
CS303	Artificial Intelligence	3	1	4	Fall	3 / Fall	E	CS102A,CS203 , MA212	CS
CS305	Computer Networks	3	1	4	Fall	3 / Fall	E	CS102A	CS
CS309	Object-oriented Analysis and Design	3	1	4	Fall	3 / Fall	E	CS102A, CS203	CS
CS302	Operating Systems	3	1	4	Spr.	3 / Spr.	E	CS102A, CS203	CS
CS304	Software Engineering	3	1	4	Spr.	3 / Spr.	E	CS309	CS
CS306	Data Mining	3	1	4	Spr.	3 / Spr.	E	CS203	CS
CS308	Computer Vision	3	1	4	Spr.	3 / Spr.	E	MA103A	CS
CS312	Computer Graphics	3	1	4	Spr.	3 / Spr.	E	CS102A, CS203	CS
CS314	Internet of Things	3	1	4	Spr.	3 / Spr.	E	CS309, CS305	CS
CS316	Parallel and Cloud Computing	3	1	4	Spr.	3 / Spr.	E	NA	CS
EE326	Digital Image Processing	3	1	4	Spr.	3 / Spr.	E	EE205	EE
EE332	Digital Signal Processing	3	1	4	Spr.	3 / Spr.	E	EE202-17	EE
CS401	Intelligent Robots	3	1	4	Fall	4 / Fall	E	CS102A, CS203, MA212	CS
CS405	Machine Learning	3	1	4	Fall	4 / Fall	E	MA212,MA103 A	CS
CS407	Advanced Computer	3	1	4	Fall	4 / Fall	E	CS305	CS

	Networks and Big Data								
CS419	Advanced Algorithms	3	1	4	Fall	4 / Fall	E	NA	CS
CS421	Advanced Artificial Intelligence	3	1	4	Fall	4 / Fall	E	CS303	CS
CS319	Advanced Computer Science Experiment I	1	1						
CS322	Advanced Computer Science Experiment II	1	1						
CS417	Advanced Computer Science Experiment III	1	1						
CS470	Industrial Practice	2	2						
CS490	Thesis(Graduation project)	8	8	16					
Total		**100**	**42**	**132**					

Table 4: Overview of Course Hours and Credits

Course Category	Total Course Hours	Total Credits	The Minimum Credit Requirement
General Education (GE) Required Courses	848	50.5	50.5
General Education (GE) Elective Courses			10
Major Foundational Courses	416	21	21
Major Core Courses	432	21	21
Major Elective Courses	1456	73	16
Advanced computer science experiment, Internship and Undergraduate Thesis/Projects	About 380	13	13
Total	3532	178.5	131.5