

# Software Engineering

## I . Degree

Bachelor of Engineering (*B.Eng.*)

## II . Normal Period of Study

4 years

## III. Objectives

Students are required to master the knowledge of engineering science, engineering expertise and management, be capable of analyzing and solving problems, organizing and managing, cooperating and communicating, and to have innovative thinking, lifelong learning ability, social responsibility, professional ethics and humanistic literacy. Graduates are supposed to become high-level professional talents to engage in system R & D and technical management to solve complex engineering problems in the fields of software engineering. Specifically, the objectives of cultivation (expected to be achieved 5 years after graduation) include:

1. Have high humanities and social science literacy, social responsibility and engineering professional ethics, rich engineering experience, in-depth understanding of the informationization needs of occupations and industries related to the field of software engineering, and have the ability to provide professional and independent technical insights.

2. Have the ability to flexibly solve complex engineering problems with knowledge of mathematics, natural science, economics and management, and be proficient in research, design, development and comprehensive application of software systems to become the core backbone of R & D projects.

3. Have outstanding ability to innovate, to deeply understand and accurately evaluate the impact of engineering practices on environment and sustainable development of society, and have the ability to design and develop complex software systems with consideration of health, safety, law and culture.

4. Have the ability to manage work team and coordinate projects, organize, formulate and effectively implement work plans, and to effectively communicate with peers and the public on complex engineering issues.

5. Have the ability of life-long learning so as to cope with the challenges of scientific and technological development and master emerging technologies; have the concept of sustainable development and an international perspective to successfully exchange and cooperate in cross-cultural contexts.

## IV. Requirements

Students in this major will mainly study the basic theory and basic knowledge related to

software engineering, receive basic training in software engineering. They have basic capabilities and preliminary experience in software development practice, basic ability of software project organization and basic engineering literacy. They also have initial innovations and entrepreneurial awareness, competitive awareness and team spirit, and the good ability to use foreign languages.

According to the school orientation and subject characteristics, combined with the basic standards of China Engineering Education Certification listed in the 12 basic requirements, the school proposed the following 12 graduation requirements:

1. Ability to solve complex engineering problems with mathematics, science, engineering foundations and computer expertise.

2. Able to apply the basic principles of mathematics, natural sciences and engineering science to recognize, express and analyze complex engineering problems through literature research so as to obtain effective conclusions.

3. Able to design solutions to complex engineering problems, designed to meet the specific needs of the system, module (module) or algorithm, and can reflect the sense of innovation in the design process, considering the social, health and safety, legal, cultural and environmental factors, Using the theory and technical means of computer systems and application software analysis, design and development.

4. Able to study complex engineering problems based on scientific principles and scientific methods, including designing computer hardware and software experiments, building software models, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information integration.

5. Ability to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex engineering problems, including prediction and Simulation of complex engineering problems, and understand their limitations.

6. Can make a reasonable analysis based on engineering related background knowledge, evaluate the impact of computer professional engineering practice and complex engineering problem to solve social, health, safety, law and culture issues and understand the responsibilities that should be undertaken.

7. Can understand and evaluate the impact of computer engineering practice on the environmental and socially sustainable development of complex engineering problems.

8. Humanities and social sciences with the sense of accomplishment, social responsibility, able to understand and abide by engineering professional ethics and norms in project practice and fulfill their responsibilities.

9. Ability to take on the role of the individual, team member, and principal in a multidisciplinary team.

10. To effectively communicate and exchange ideas with industry peers and the general public on complex engineering issues, including writing reports and designing drafts, making presentations, and articulating or responding to directives. And have a certain international perspective, to the cross-cultural background to communicate and exchange.

11. Understand and master the principles of project management and economic decision-making and apply them in a multidisciplinary environment.

12. With self-learning and lifelong-learning awareness, develop the capacity for continuous learning and being flexible.

#### **V. Core courses**

Object-oriented Programming, Discrete Mathematics, Data Structure, Software Analysis Method and Engineering Technology, Operating System, Compiler Principle, Computer Networks, Embedded System, Fundamentals of Computer Programming ( I , II )

#### **VI. Components of the 4-year Curriculum**

<b>Category</b>	<b>Credits</b>
1. General Education Courses	22
2. Discipline Education Courses	34
3. Specialized Courses	77
<b>Total</b>	<b>133</b>

VII. Table of Teaching Plan for Major of Software Engineering

课程编码 Course No	课程名称    Course Name	学 分	总学 时	讲 课	实 验	上 机	实 践	学年-学期 Academic Year-Semester												开课 单位
								I-0	I-1	I-2	II-0	II-1	II-2	III-0	III-1	III-2	IV-0	IV-1	IV-2	
必修课程●通识教育课 (22 学分)    Compulsory Course●Course of General Education																				
140228E1	中国概况【英】    Introduction to China[E]	2	32	32					2										114	
210206E1	太极拳【英】    Tai Chi[E]	2	32	32					2										122	
581113E2	汉语入门 (I)【英】    Fundamental Chinese (I)[E]	4	64	64					4										371	
580116E1	中国历史与文化【英】    Chinese History and Culture[E]	2	32	32						2									371	
582113E2	汉语入门 (II)【英】    Fundamental Chinese (II)[E]	4	64	64						4									371	
581114E1	汉语进阶 (I)【英】    Chinese for Specific Purpose (I)	4	64	64							4								371	
582114E1	汉语进阶 (II)【英】    Chinese for Specific Purpose (II)	4	64	64								4							371	
必修课程●学科教育课 (34 学分)    Compulsory Course●Course of Discipline Education																				
111233E4	高等数学 (I)【英】    Advanced Mathematics (I)[E]	6	96	96					6										113	
111208E6	大学物理 (I)【英】    College Physics (I)[E]	4.5	72	72						4.5									113	
111209E4	大学物理实验 (I)【英】    Experiments on College Physics (I)[E]	1.5	24		24					1.5									113	
112233E1	高等数学 (II)【英】    Advanced Mathematics (II)[E]	6	96	96					6										113	
110240E1	工程数学【英】    Engineering Mathematics[E]	4	64	64							4								113	
110312E3	线性代数【英】    Linear Algebra[E]	3	48	48							3								113	
112208E6	大学物理 (II)【英】    College Physics (II)[E]	4.5	72	72							4.5								113	
112209E4	大学物理实验 (II)【英】    Experiments on College Physics (II)[E]	1.5	24		24						1.5								113	
110226E1	概率与统计【英】    Probability and Statistics[E]	3	48	48								3							113	
必修课程●专业基础课 (77 学分)    Compulsory Course●Fundamental Specialized Course																				

课程编码 Course No	课程名称    Course Name	学 分	总学 时	讲 课	实 验	上 机	实 践	学年-学期 Academic Year-Semester										开课 单位		
								I-0	I-1	I-2	II-0	II-1	II-2	III-0	III-1	III-2	IV-0		IV-1	IV-2
060001E7	计算机导论【英】    Introduction to Computer Technology[E]	3	48	48					3											106
060217E1	C++程序设计【英】    C++ Programming[E]	5	80	48		32			5											106
060307E1	计算机逻辑基础【英】    Fundamentals of Computer Logic[E]	4	64	56	8					4										106
060316E1	C++课程设计【英】    Course Design of C++[E]	2	80				80			2										106
060218E6	JAVA 程序设计【英】    Java Programming[E]	4	64	48	16						4									106
060221E5	离散数学【英】    Discrete Mathematics[E]	4.5	72	72							4.5									106
060224E1	数据结构【英】    Data Structure[E]	4	64	48		16					4									106
060208E2	计算机组成原理【英】    Principles of Computer Organization[E]	4.5	72	64	8							4.5								106
060225E1	数据库系统【英】    Database System[E]	4	64	48		16						4								106
060278E1	J2EE 实用基础【英】    Fundamentals of J2EE Applications[E]	2	32	24		8						2								106
060201E2	计算机网络【英】    Computer Network[E]	3	48	40	8									3						106
060220E1	操作系统【英】    Operating System of Computer[E]	4	64	48	8	8								4						106
060266E2	面向对象建模技术【英】    Object-oriented Modeling[E]	3	48	40		8								3						106
060274E5	软件项目管理【英】    Software Project Management[E]	3	48	32	16									3						106
061254E2	软件课程设计（I）【英】    Software Course Design（I）[E]	2	80				80							2						106
060219E1	编译方法【英】    Compiler Principles[E]	4	64	48		16									4					106
060231E4	算法设计与分析【英】    Algorithm Design & Analysis[E]	3	48	32	16										3					106
062254E2	软件课程设计（II）【英】    Software Course Design（II）[E]	1	40				40								1					106
060292E1	人机交互技术【英】    Human-Computer Interaction Technology[E]	2	32	32													2			106
063254E2	软件课程设计（III）【英】    Software Course Design(III)[E]	2	80			80											2			106
060202E8	毕业设计【英】    Graduation Project[E]	10	560				560											10		106

课程编码 Course No	课程名称    Course Name	学 分	总学 时	讲 课	实 验	上 机	实 践	学年-学期 Academic Year-Semester												开课 单位	
								I-0	I-1	I-2	II-0	II-1	II-2	III-0	III-1	III-2	IV-0	IV-1	IV-2		
060267E2	软件体系结构【英】    Software Architecture[E]	3	48	32	16															3	106
	必修课程汇总    Compulsory Courses Total	133	2696	1608	144	184	760	0	22	24	0	29.5	17.5	0	15	8	0	4	13		

注：学期为“0”的表示夏季学期，“1”秋季学期，“2”春季学期。

Notes: semester '0' stands for Summer semester, '1' and '2' stands for Autumn semester and Spring semester.