

Bachelor of Engineering in Software Engineering

Program Description and Curriculum Guide

Program Code: 080902

(Course conducted in English)

I. Educational Objectives

This program is designed to cultivate multi-level, practical, complex and international software talents with demand-oriented and quality-first as its aim. Students will be trained to master the basic computer theory, software development, software management and other computer application technology, as well as the ability to use advanced engineering methods, techniques and tools for software analysis, design, development, maintenance and other work, in accordance with the direction of engineering training, reform the software personnel training mode, increase the training of software personnel, and strive to train competitive, complex, practical software engineering senior technical talents and management talents.

The specific objectives are as follows:

1. have a good sense of social responsibility, professional ethics, scientific spirit and humanistic qualities, through years of work practice, have relevant legal knowledge and engineering ethical and moral responsibilities, and respect social values.
2. have a solid knowledge of mathematics and natural sciences, systematic professional knowledge and a sense of lifelong learning, proficient in business and capable of handling relevant job positions.
3. have innovative spirit, strong analytical and problem-solving skills, good sense of engineering responsibility and practical ability to design solutions to complex engineering problems in the field of software engineering, using professional theories and techniques to achieve software systems that meet practical needs.
4. have good teamwork, communication and management skills, with the ability to undertake tasks independently or lead teams in software engineering projects to complete tasks.

5. Have the awareness, knowledge, attitude and skills of tolerance, cognition and adaptation to cultural diversity, and be able to play a role in mutual respect, understanding and solidarity among different nationalities, societies and countries. Have a certain global vision in the field of software engineering, be able to use software engineering knowledge and skills in the actual environment of many countries, and have the preliminary ability to participate in international exchanges and cooperation.

II. Attributes & Competencies

Students in this program should meet the following requirements at the time of graduation:

1. **Engineering Knowledge:** The ability to apply mathematical, natural science, and engineering fundamentals and expertise to solve complex engineering problems in the field of software engineering.
2. **Problem Analysis:** Be able to integrate basic principles and methods from mathematics, natural and engineering sciences to identify, express and analyze complex engineering problems in the field of software engineering through literature research in order to obtain valid conclusions.
3. **Design and Development:** The ability to design solutions to complex engineering problems in the field of software engineering, to design software and hardware systems that meet specific needs, and to demonstrate a sense of innovation in the design process, taking into account of social, health, safety, legal, cultural, and environmental factors.
4. **Research:** The ability to conduct research on complex engineering problems in the field of software engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and synthesizing information to reach reasonable and valid conclusions.
5. **Using Modern Tools:** Be able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex engineering problems in the field of software engineering to accomplish predictions and simulations of complex engineering problems in the field of software engineering, and be able to understand their limitations.
6. **Engineering and Society:** Be able to perform sound analysis based on relevant background knowledge of complex engineering problems in the field of software engineering, evaluate the social, health, safety, legal, and cultural impacts of the profession's engineering practices and solutions, and understand the responsibilities to be assumed.

7. Environment and Sustainability: Be able to understand and evaluate the environmental, socially sustainable impacts of engineering practices that address complex engineering problems in the field of software engineering.
8. Professional Code: With humanities and social science literacy and social responsibility, can understand and abide by engineering professional ethics and code of conduct in engineering practice, and fulfill the social responsibility of software engineers.
9. Individual and Team: Team player, able to assume the role of individual, team member and leader in a multidisciplinary context.
10. Communication: Upon graduation, the Chinese proficiency should reach Level 4 of *Chinese Proficiency Grading Standards for International Chinese Language Education*, the ability to effectively communicate and interact with industry peers and the public on complex engineering issues in the field of software engineering, including writing reports, designing manuscripts, presenting statements, and articulating or responding to instructions.
11. Project management: Understand engineering management principles and economic decision-making methods in the field of software engineering, and can be applied in a multidisciplinary environment.
12. Lifelong Learning: A sense of self-directed and lifelong learning, the ability to track developments in the field of software engineering, and the ability to continuously learn and adapt to developments.

III. Systems

4 years

IV. Discipline

Software Engineering

V. Degree Program

Bachelor of Engineering

VI. Degree Courses

Fundamentals of Programming (C), Data Structures, Discrete Mathematics, Principle of Compiling, Database Systems Principles, Operating Systems Principles, Computer Communication and

Networking, Software Project Management, Software Requirements Analysis and Design, Software Data Analysis and Application

VII. Course Credits & Hours

Table 1. Course Modules and Credits

Course Modules	Category	Credits	Hrs	%	Credits (T)	Hours (T)	Credits (P)	Hours (P)
General Studies and Liberal Studies	General Public Compulsory Courses	24	472	15.5%	19.5	328	4.5	144
	General Public Optional Courses	6	96	3.9%	6	96		
Academic specialties	Subject Foundation Courses	50	888	32.3%	44.5	712	5.5	176
	Major Core Courses	31.5	592	20.3%	26	416	5.5	176
Open Integration	Major Optional Courses	11.5		7.4%				
	Cross-open Courses	2		1.3%				
Innovative Practices	Innovation and Entrepreneurship Education (not mandatory)							
	Practical teaching	30		19.4%				
Total		155						
T (Theoretical Lectures), P (Practice/Lab Sessions)								

VIII. Curriculum System

Table 2. Available Courses for Each Semester

Term	Course Name	Credits	Hours	Term	Course Name	Credits	Hours
Semester I	Introduction to China	4	72	Semester II	Basic Chinese II	4	64
	Basic Chinese I	4	64		Physical Education II	1	36
	Physical Education I	1	36		Advanced Mathematics A (Part II)	4	64
	Introduction to Major	2.5	40		Linear Algebra	3	48
	Advanced Mathematics A (Part I)	6	96		College Physics A (Part I)	2	32
	Fundamentals of Programming (C)	4	80		Experiment of College Physics	1.5	48
	Course Design of Fundamentals of Programming	1	1 week		Object Oriented Programming (JAVA)	3	56
					Course Design of Object Oriented Programming	1	1 week
					Digital Circuits and Logical Design	3.5	64
	Subtotal	22.5			Subtotal	23	
Semester III	Applied Chinese I	4	64	Semester IV	Applied Chinese II	4	64
	Physical Education III	1	36		Physical Education IV	1	36
	College Physics A (Part II)	4	64		Principle of Database System	4	80
	Probability Theory and Mathematical Statistics	4	64		Course Design of Principle of Database System	1	1 week
	Discrete Mathematics	4	64		Software Requirements Analysis and Design	3.5	64
	Data Structure	4	80		Software Project Practice	1	1 week
	Course Design of Data Structure	1	1 week		Comprehensive Practice Project on Software Engineering I	3	3 weeks
					Introduction to Software Engineering	4	72
	Subtotal	22			Subtotal	21.5	
Semester V	Software Quality Assurance & Testing	3.5	64	Semester VI	Principle of Operating System	3.5	64
	Software architecture	3.5	64		Course Design of Principle of Operating System	1	1 week

	Computer Communication and Networks	4	80		Software Project Management	3.5	64
	Course Design of Computer Communication and Networks	1	1 week		Course Design of Software Project Management	1	1 week
	Optional	6			Optional	9	
	Subtotal	18			Subtotal	18	
Semester VII	Software Data Analysis and Application	4	72	Semester VIII	Graduation Projection	15	
	Python Data Analysis Practice	1	1 week				
	Principle of Compiling	3.5	64				
	Course Design of Principle of Compiling	1	1 week				
	Artificial intelligence project practice	2	2 weeks				
	Optional	4.5					
	Subtotal	16			Subtotal	15	

IX. Guidelines

1. Maximum number of years of study: 8 years
2. Minimum credit requirements for graduation: 155 credits