浙江科技学院软件工程专业培养方案

一、培养目标

　　本专业的培养目标为：面向信息与软件产业需求，培养具有扎实的基础理论和专业知识，过硬的软件开发技能，规范的软件设计和项目管理能力，开阔的国际视野，良好的职业道德和社会责任感，较强的持续学习和创新能力的高素质应用型软件人才，毕业后能从事软件工程领域的研究、设计、开发、维护、管理与服务等方面工作。毕业5年后，将成为企业(单位)的技术或管理骨干。

二、毕业要求

毕业需要达到以下12个要求：

1. 工程知识：能够将数学、自然科学、工程基础和专业知识用于解决软件工程领域复杂工程问题。
2. 问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析软件工程领域复杂工程问题，以获得有效结论。
3. 设计/开发解决方案：能够设计针对复杂软件工程问题的解决方案，设计/开发相关的软件系统、模块（组件），并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。
4. 研究：能够基于软件工程科学原理并采用软件工程方法对复杂软件工程问题进行研究，包括建立软件模型、设计实验、分析与解释数据，并通过信息综合得到合理有效的结论。
5. 使用现代工具：能够针对复杂软件工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，对复杂软件系统进行分析、设计、验证、实现、应用和维护等，并能够理解其局限性。
6. 工程与社会：能够基于工程相关背景知识进行合理分析，评价软件工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。
7. 环境和可持续发展：能够理解和评价针对复杂软件工程问题的专业工程实践对环境、社会可持续发展的影响。
8. 职业规范：具有人文社会科学素养、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。
9. 个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。
10. 沟通：能够就复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令，并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。
11. 项目管理：理解并掌握软件项目的工程管理原理与经济决策方法，并在多学科环境中应用。
12. 终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力.

三、毕业要求达成矩阵

毕业要求	指标点	相关教学活动	学生考核方式	
1. 工程知识：能够将数学、自然科学、工程基础和专业知识用于解决软件工程领域复杂工程问题。	1.1 具备运用数学、自然科学基础知识的能力。	高等数学A1-A2、线性代数B、概率论与数理统计A、大学物理B1-B2、大学物理实验B、离散数学、数字逻辑等	课程平时考核；	期末考核
	1.2 掌握计算机系统基础知识和基本理论。	软件工程专业导论1、数据结构、数字逻辑、计算机组成、计算机网络、操作系统原理等	课程平时考核；	期末考核
	1.3 掌握软件工程基本理论和方法。	软件工程专业导论2、软件工程概论、软件质量保证与测试、软件体系结构等	课程平时考核；	期末考核
2. 问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析软件工程领域复杂工程问题，以获得有效结论。	2.1 拥有计算和抽象思维能力，对软件系统及相关问题进行抽象和建模。	高等数学A1-A2、线性代数B、概率论与数理统计A、离散数学、程序设计基础（C语言）、数据结构、面向对象程序设计等	课程平时考核；	期末考核
	2.2 具有一定的软件系统分析能力，并利用草稿、图表、流程图等工程方法描述相关问题。	程序设计基础（C语言）、面向对象程序设计、软件工程概论、软件交互设计、软件体系结构等	课程平时考核；	期末考核
	2.3 利用互联网等现代信息技术方法获取资料和专业文献并进行研究分析	科技文献检索、毕业设计（论文）等	文档作品；答辩	
3. 设计/开发解决方案：能够设计针对复杂软件工程问题的解决方案，设计/开发相关的软件系统、模块（组件），并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。	3.1 掌握程序设计理论与方法、具备软件开发技能	程序设计基础（C语言）、程序设计基础（C语言）实验、数据结构、面向对象程序设计等	课程平时考核；	期末考核
	3.2 具备软件系统的设计和开发能力	Java程序课程设计、软件交互设计、Web组件开发、方向模块课等	课程平时考核；	期末考核
	3.3 针对特定复杂软件工程问题的需求，能够提出并设计合理的解决方案，并能社会、健康、安全、法律、文化及环境等因素。	数据库原理与应用、软件工程概论、软件交互课程设计、Web组件开发课程设计、软件体系结构、系统集成及优化（或跨平台脚本与开放技术）等	课程平时考核；	期末考核

	3.4 具备追求创新的态度和意识，能在工程实践中提出新思路和新方案。	软件体系结构、基于软件过程的综合课程设计、毕业设计（论文）、第二课堂（创新实践）等	课程平时考核； 文档作品； 答辩	期末考
4. 研究：能够基于软件工程科学原理并采用软件工程方法对复杂软件工程问题进行研究，包括建立软件模型、设计实验、分析与解释数据，并通过信息综合得到合理有效的结论。	4.1 掌握软件过程模型、软件设计思路和基本原理、软件工程方法等。	数据库原理与应用、软件工程概论、软件交互设计、软件质量保证与测试、软件体系结构等	课程平时考核；	期末考核
	4.2 掌握软件可行性分析、需求获取方法得到结论并规范化描述。	软件工程概论、基于软件过程的综合课程设计、毕业设计（论文）等	课程平时考核； 文档作品； 答辩	期末考
	4.3 能够设计合理的实验和方法对软件需求、系统构架、模块代码和软件文档等进行测试评估。	计算机组成、操作系统原理、软件质量保证与测试、基于软件过程的综合课程设计、毕业设计（论文）等	课程平时考核； 报告作品； 答辩	期末考
5. 使用现代工具：能够针对复杂软件工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，对复杂软件系统进行分析、设计、验证、实现、应用和维护等，并能够理解其局限性。	5.1 掌握软件设计和开发过程中使用的各种工具和方法	软件工程概论、软件交互设计、Web组件开发、软件质量保证与测试、基于Java EE企业级开发技术、数据存储技术（或移动应用开发基础和拓展）等	课程平时考核； 文档作品； 答辩	期末考
	5.2 掌握多种开发工具、技术资源和方法的特性，针对特定复杂软件工程问题对其进行分析、比较和选择。	数据库原理与应用、基于软件过程的综合课程设计、系统集成与优化(或跨平台脚本与开放平台技术)、毕业设计（论文）等	课程平时考核； 文档报告； 答辩	期末考核；
6. 工程与社会：能够基于工程相关背景知识进行合理分析，评价软件工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。	6.1 掌握人、网络、计算机、社会等之间关系，了解软件工程实践问题可能对社会、健康、安全、法律及文化方面的影响。	形势与政策1-4、软件工程专业导论2、计算机网络、认知实习、技术实习等	课程平时考核； 文档报告； 答辩	期末考
	6.2 理解并运用软件工程行业中相关的行业规范、国际标准和法律法规，评价软件工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。	软件工程概论、知识产权与职业素养、毕业设计（论文）等	课程平时考核； 文档报告； 答辩	期末考
7. 环境和可持续发展：能够理解和评价针对复杂软件工程问题的专业工程实践对环境、社会可持续发展的影响。	7.1 理解软件工程实践所涉及的环境保护和社会可持续发展的方针、政策和法律。	思想道德修养与法律基础、形势与政策1-4、软件工程专业导论1、知识产权与职业素养等	课程平时考核；	期末考核
	7.2 能认识并评价复杂软件工程问题的专业实践和对环境以及社会可持续发展的影响。	大学物理B1-B2、大学物理实验B、自然科学拓展课程群、软件工程专业导论2、毕业设计（论文）等	课程平时考核； 文档报告； 答辩	期末考
8. 职业规范：具有人文社会科学素养、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。	8.1 能够树立正确的世界观、人生观、价值观，具备良好的人文社会科学素养、社会责任感。	大学始业教育、军事理论及训练、思政社会实践、中国近现代史纲要、马克思主义基本原理概论、毛泽东思想和中国特色社会主义理论体系概论、大学语文、大学生心理健康教育等	课程平时考核；	期末考核
	8.2 能够具备良好的专业素质和职业道德和规范，履行责任。	大学生职业发展与就业指导实践、思想道德修养与法律基础、大学生职业发展与就业指导1-2、知识产权与职业素养、技术实习等	课程平时考核；	期末考核
9. 个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。	9.1 能够在多学科背景下理解团队的意义，了解软件项目团队的角色及职责。	KAB创业基础、软件项目管理与案例分析、认知实习等	课程平时考核； 报告； 答辩	期末考
	9.2 具备组织、沟通、协调、服务等能力，能够在复杂项目实施过程中承担相关角色。	软件交互课程设计、Web组件开发课程设计、软件项目管理与案例分析、基于软件过程的综合课程设计、技术实习等	课程平时考核； 报告作品； 答辩	期末考
10.沟通：能够就复杂工程问题与业界同行及社会公	10.1 具有良好语言表达和文字组织能力，能够有效进行技术交流与沟通。	KAB创业基础、Java程序课程设计、科技文献检索、认知实习、第二课堂（创新实践）等	课程平时考核； 报告作品； 答辩	期末考

众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令，并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。	10.2 能够具备一定的国际视野，掌握一门外语，能够了解和跟踪软件工程专业的最新发展趋势，具有跨文化交流和沟通能力。	大学英语2-3或3-4、工程师英语1-2等	课程平时考核；　期末考核
	10.3 能够按照行业规范、国际标准进行技术文档撰写和交流。	工程师英语1-2、基于软件过程的综合课程设计、技术实习、毕业设计（论文）等	课程平时考核；　期末考核；报告作品；答辩
11. 项目管理：理解并掌握软件项目的工程管理原理与经济决策方法，并在多学科环境中应用。	11.1 能够理解和掌握复杂软件工程项目管理原理和经济决策方法。	软件项目管理与案例分析、技术实习、管理和经济类选修课等	课程平时考核；　期末考核；答辩
	11.2 能够在多学科环境中根据复杂软件工程项目特征选择恰当的项目管理方法和经济决策方法。	软件项目管理与案例分析、基于软件过程的综合课程设计、毕业设计（论文）等	课程平时考核；　期末考核；报告作品；答辩
	11.3 能够选择恰当的软件项目管理工具、工程模型，具备对复杂软件工程项目进行项目管理的能力并进行实践。	软件项目管理与案例分析、基于软件过程的综合课程设计、毕业设计（论文)等	课程平时考核；　期末考核；报告作品；答辩
12. 终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。	12.1 能够认识到自我探索和终身学习的必要性和重要性。	大学始业教育、马克思主义基本原理概论、毛泽东思想和中国特色社会主义理论体系概论、大学生职业发展与就业指导1-2、认知实习、第二课堂（创新实践）等	课程平时考核；　期末考核；文档报告
	12.2 拥有健康的体质，能够养成主动学习习惯，运用科学的学习方法管理知识和处理信息，有不断学习和适应发展的能力。	军事理论及训练、体质健康训练、大学生职业发展与就业指导实践、体育1-4、大学生心理健康教育、大学生职业发展与就业指导1-2等	课程平时考核；　期末考核

四、主干学科

计算机科学与技术、软件工程

五、专业核心课程

面向对象程序设计、数据库原理与应用、web组件开发、软件交互设计、软件工程概论、软件质量保证与测试、软件体系结构、软件项目管理与案例分析

六、主要实践环节

认识实习、社会实践、科研实践、课程实验、课程设计、技术实习、毕业设计（论文）

七、学制、学位及毕业学分要求

1．学制：实行弹性学制，本科基本学制一般为4年，可提前1年毕业，最长不超过8年
2．授予学位：工学学士学位
3．本专业毕业最低学分要求：173

八、学分结构要求

课程设置及修读类型			学分及占比	
			学分	学分比例
理论教学环节（不含课内实验）	通识教育课	必修	54	31%
		选修	8	5%
	学科专业类基础课	必修	24.5	14%
	专业核心课（必修）		24.5	14%
	拓展复合课（选修）		16	9%
	小计		127	73%
实践教学环节	必修		46	27%
合计			173	100%

Undergraduates Program in __Software Engineering__

I. Educational Objectives

The training target of this major is: To meet the requirements of the information and software industry with solid basic theory and professional knowledge, strong software development skills, software design and project management skills, a well as open international vision, good professional ethics and social responsibility. The strong ability of continuous learning and innovation are also necessary for the high-quality software talents in practice. After graduation, students can engage in design, development, maintenance, management and service work in the field of software engineering. Five years after graduation, students are capable to be the technology or management backbone.

II. Graduation Requirements

1. The engineering knowledge: Students are able to use mathematics, natural science and basic and professional engineering knowledge to solve complex software engineering problems.
2. Problem analysis: able to apply the basic principles of mathematics, natural science and engineering science in software engineering problems. To recognize, express professional literatures, and use them in software engineering problems, thus to obtain valid conclusions.
3. Design/develop solutions: Students are able to design solutions for complex software engineering problems, which include design and develop software systems, modules (components), and are able to consider social, health, safety, legal, cultural and environmental factors in the design process. Consciousness of innovation should also be reflected.
4. Research: Students are able to study complex software engineering problems based on software engineering science principle and using software engineering method. The problems include software modeling, experiments designing, data analysis and interpretation. Reasonable and effective conclusions should be made from the comprehensive information.
5. The use of modern tools: Students can on complex software engineering problems, the development, selection and use of appropriate technology, resources and modern engineering tools and information technology, the complicated software system analysis, design, validation, implementation, application and maintenance, etc., and be able to understand its limitations.
6. Engineering and society: Students can carry on reasonable analysis based on the engineering background knowledge, and to evaluate the influence of the specific software engineering practice to the problems in society, healthy, safety, law and culture, and fulfill the corresponding responsibilities.
7. The environment and sustainable development: Students should have the ability to understand and evaluate the influence on the environment and the social sustainable development when performing the complicated software engineering practices.
8. Professional morals: Students should have humanities and social science literacy, and can fulfill the corresponding social responsibilities. Professional ethics and norms should be abide in the engineering practice.

III. Achievement Matrix of Graduation Requirements

Graduation Requirements	Indicators of Graduation Requirements	The Main Courses and Programs	Assessment
1.The engineering knowledge: be able to use mathematics, natural science and basic professional engineering knowledge to solve complex software engineering problems.	1.1 Be able to use basics of mathematics, natural science	Advanced Mathematics A1-A2,Linear Algebra B,Probability Theory and Mathematical Statistics Level A,College Physics B1-B2,Experiment of college physics Level B,Discrete Mathematics,Digital Logical	Regular Assessment; Final Exam
	1.2 Master the basic knowledge and theories of the computer system	Professional Introduction of Software Engineering 1,Data Structure,Digital Logical,Computer Organization,Computer Network,Principles of Operating System	Regular Assessment; Final Exam

	1.3 Master the basic knowledge and method of software engineering	Professional Introduction of Software Engineering 2,Fundamentals of Software Engineering,Software Quality Assurance and Test,Software Architecture	Regular Assessment; Final Exam
2. Problem analysis: able to apply the basic principles of mathematics, natural science and engineering science in software engineering problems. To recognize, express professional literatures, and use them in software engineering problems, thus to obtain valid conclusions.	2.1 Have the ability of calculation and abstract thinking for software system abstraction and modeling.	Advanced Mathematics A1-A2,Linear Algebra B,Probability Theory and Mathematical Statistics Level A,Discrete Mathematics,Fundamentals of Programming(C Language) ,Data Structure,Object-Oriented Programming	Regular Assessment; Final Exam
	2.2 Have the ability to analyze software system, use the drafts, charts, flow charts and other engineering method to describe related problems.	Fundamentals of Programming(C Language) ,Object-Oriented Programming,Fundamentals of Software Engineering,Software Design and Interaction,Software Architecture	Regular Assessment; Final Exam
	2.3 Using the Internet and other modern information technology methods to obtain information and professional literature to conduct study	Scientific Documents Retrieval,Graduate Project (Thesis)	Document\Works; Defence
3. Design/develop solutions: Students are able to design solutions for complex software engineering problems, which include design and develop software systems, modules (components), and are able to consider social, health, safety, legal, cultural and environmental factors in the design process. Consciousness of innovation should also be reflected.	3.1 Master program design theory and method, have software development skills	Fundamentals of Programming(C Language) ,Experiments in Fundamentals of Programming(C Language) ,Data Structure,Object-Oriented Programming	Regular Assessment Final Exam
	3.2 The ability to design and develop software system	Course Design of Java Programming,Software Design and Interaction,Web Component Development	Regular Assessment Final Exam
	3.3 To give reasonable design solutions to meet the requirements of specific complex software engineering problems, and also to balance the social, health, safety, legal, cultural and environmental factors.	Principles and Application of Database System,Fundamentals of Software Engineering,Course Design of of Software Interaction,Course Design of Web Component Development,Software Architecture,System Integration and Optimization（or Cross Platform Script and Open Platform	Regular Assessment Final Exam
	3.4 Have the attitude and consciousness of innovation, and can put forward new ideas and new solutions in the engineering practice.	Software Architecture,Course Design of Software Development Based on Procedure Management,Graduate Project (Thesis),Extracurricular Teaching	Regular Assessment Final Exam; Document\Works; Defence
4. Research: Students are able to study complex software engineering problems based on software engineering	4.1 Master software process models, software design thinking and basic principles, method of software engineering, etc.	Principles and Application of Database System,Fundamentals of Software Engineering,Software Design and Interaction,Software Quality Assurance and Test,Software Architecture	Regular Assessment Final Exam

science principle and using software engineering method. The problems include software modeling, experiments designing, data analysis and interpretation. Reasonable and effective conclusions should be made from the comprehensive information.	4.2 Master the method of software feasibility analysis, the method of software requirement and making conclusion and normalized description.	Fundamentals of Software Engineering,Course Design of Software Development Based on Procedure Management,Graduate	Regular Assessment Final Exam; Document\Works
	4.3 Able to design reasonable experiment and method to test or evaluate software requirements, system architecture, module code and document.	Computer Organization,Principles of Operating System,Software Quality Assurance and Test,Course Design of Software Development Based on Procedure Management,Graduate Project (Thesis)	Regular Assessment Final Exam; Document\Works; Defence
5. The use of modern tools: Students can on complex software engineering problems, the development, selection and use of appropriate technology, resources and modern engineering tools and information technology, the complicated software system analysis, design, validation, implementation, application and maintenance, etc., and be	5.1 To master the various tools and methods used in software design and development process.	Fundamentals of Software Engineering,Software Design and Interaction,Web Component Development,Software Quality Assurance and Test,Enterprise Level Development Technology Based on JavaEE,Advanced Data	Regular Assessment Final Exam; Document\Works; Defence
	5.2 To master a variety of development tools and technical resources and method features, making analysis, comparison and choices for specific software engineering problem.	Principles and Application of Database System,Course Design of Software Development Based on Procedure Management,System Integration and Optimization(or Cross Platform Script and Open Platform Technology），Graduate	Regular Assessment Final Exam; Document\Works; Defence
6. Engineering and society: Students can carry on reasonable analysis based on the engineering background knowledge, and to evaluate the influence of the specific software engineering practice to the problems in society, healthy, safety, law and culture, and fulfill the corresponding responsibilities.	6.1 Master the relationships between people, network, computer, and the society, so as to understand the influence of software engineering practices upon society, health, safety, legal and cultural issues.	Situation and Policy,Professional Introduction of Software Engineering 2,Computer Network,Cognition Practice,Technology Practice	Regular Assessment Final Exam; Document\Works; Defence
	6.2 Understand and apply the software engineering industry standards, international standards and laws and regulations to evaluate the software engineering practice and its effects on the problems of social, health, safety	Fundamentals of Software Engineering,Intellectual property rights and Career Quality,Graduate Project (Thesis)	Regular Assessment Final Exam; Document\Works; Defence
7. The environment and sustainable development: Students should have the ability to understand and evaluate the influence on the environment and the social sustainable development when performing the complicated software engineering practices.	7.1 Understand the principles, policies and laws of environmental protection and social sustainable development involved during software engineering practices.	Morality Cultivation and General knowledge of Law,Situation and Policy,Professional Introduction of Software Engineering 1,Intellectual property rights and Career Quality	Regular Assessment Final Exam
	7.2 To Know and evaluate the impact of software engineering practice on environment and social sustainable development.	College Physics B1-B2,Experiment of college physics Level B,Professional Introduction of Software Engineering 2,Graduate Project (Thesis)	Regular Assessment Final Exam; Document\Works; Defence

8. Professional morals: Students should have humanities and social science literacy, and can fulfill the corresponding social responsibilities. Professional ethics and norms should be abide in the engineering practice.	8.1 Correct outlook on world, life and values should be established, as well as good accomplishment in the humanities and social sciences, and social responsibility.	Induction of University Life,Military Theory and Training ,Ideological Social Practice ,The Essentials of Modern and Contemporary History of China,Introduction to Fundamental Principles of Marxism,Introduction to Mao Zedong's Thought and Theoretical System of Socialism with Chinese Characteristics,College	Regular Assessment Final Exam
	8.2 To have good professional quality and professional ethics, able to fulfill the responsibility.	Practice of career planning and guidance for college students,Morality Cultivation and General knowledge of Law,Career planning and guidance for college students1-2,Intellectual property rights and Career Quality,Technology Practice	Regular Assessment Final Exam
9. Individual and team: Students can undertake different roles as individuals, team members, or team leaders in teams with multidisciplinary background.	9.1 Able to understand the meaning of the team under multidisciplinary background, understand the role and their responsibility in software project team.	Know About Business,Software Project Management and Case Study,Cognition Practice	Regular Assessment Final Exam; Document\Works; Defence
	9.2 Able to organize, communicate, coordinate in the process of software engineering projects. Able to undertake related roles when implementation projects.	Course Design of of Software Interaction,Course Design of Web Component Development,Software Project Management and Case Study,Course Design of Software Development Based on Procedure Management,Technology Practice	Regular Assessment Final Exam; Document\Works; Defence
10. Communication: Students should have the ability to communicate effectively with the industry peers and the the public communities on complex engineering problems, which including writing reports and design documents, making presentations, giving clear expressions or responses to orders. International vision is also required to communicate under cross-cultural situations.	10.1 Have good language expression and writing abilities to conduct effective technical exchange and communication.	Know About Business,Course Design of Java Programming,Scientific Documents Retrieval,Cognition Practice,Extracurricular Teaching	Regular Assessment Final Exam; Document\Works; Defence
	10.2 Have international vision, master a foreign language, can understand and follow the latest development trend of software engineering, and have inter-cultural communication and communication skills.	College English2-3or3-4,Engineer English 1-2	Regular Assessment Final Exam
	10.3 Can writing technical documents and communication in accordance with the industry standards and international standards.	Engineer English 1-2,Course Design of Software Development Based on Procedure Management,Technology Practice,Graduate Project (Thesis)	Regular Assessment Final Exam; Document\Works; Defence
11. Project management	11.1 Able to understand and master the principles of the software engineering project management and economic decision method.	Software Project Management and Case Study,Technology Practice	Regular Assessment Final Exam; Defence

11. Project management: Students have to understand and master the software project engineering management principles and economic decision method, and apply them in multidisciplinary environment.	11.2 Can choose the appropriate project management methods and economic decision method in a multidisciplinary environment according to the characters of complex software project.	Software Project Management and Case Study,Course Design of Software Development Based on Procedure Management,Graduate Project (Thesis)	Regular Assessment Final Exam; Document\Works; Defence
	11.3 Be able to select the appropriate software project management tools, engineering model, have the ability of project management.	Software Project Management and Case Study,Course Design of Software Development Based on Procedure Management,Graduate Project (Thesis)	Regular Assessment Final Exam; Document\Works; Defence
12. Lifelong learning: Students should have the consciousness of independent learning and lifelong learning, and have the ability to learn constantly to catch up with the development.	12.1 Understand the importance and necessity of lifelong learning and self exploration	Induction of University Life,Introduction to Fundamental Principles of Marxism,Introduction to Mao Zedong's Thought and Theoretical System of Socialism	Regular Assessment Final Exam; Document\Works
	12.2 Have a healthy body, and an active learning habit, use scientific method to manage knowledge and process information; Have the ability of constant learning to adapt the development.	Military Theory and Training ,Health Training,Practice of career planning and guidance for college students,Physical Education 1-4,Mental Health Education for College Students,Career planning and guidance for college students1-	Regular Assessment Final Exam

VI. Major Disciplines

Software Engineering, Computer Science and Technology

V. Core Courses

Object-Oriented Programming, Principles and Application of Database System, Introduction to Software Engineering, Software Design and Interaction,Web Component Development,Software Quality Assurance and Test, Software Architecture, Software Project Management and Case Study

VI. Internship and Practice

Cognition Practice, Foundational Experiments,Speciality Experiments, Scientific Research and Practice, Engineering Technology Practice, Undergraduate Thesis

VII. Duration of Schooling, Degree and Credits Requirements for Graduation

1．Duration of Schooling：The length of schooling is flexible, generally it lasts four years. The students can graduate one year in advance or within 8 years.

2．Degree Conferred：Bachelor＇s degree in Engineering

3．The Minimum Graduation Credits：173

VIII．Credits Structure and Ratio：

The curriculum Provision and Course Type			Credits	Credits Ratios
	General Education Courses	Required	54	31%
		Optional	8	5%

Theory Teaching （Experiments excluded ）	Discipline & Specialty Basic Courses	Required	24.5	14%
	Specialized Core Courses （Required）		24.5	14%
	Expand and Recombination Courses （Optional）		16	9%
	Subtotal		127	73%
Practice Teaching	Required		46	27%
Total			173	100%

课程设置与学时安排（表一）

专业名称：软件工程

课程类别			课程性质	课程代码	课程名称	学分	总学时	理论学时	实验学时实践	习题学时	研讨学时	课外学时	考试学期	长1 16周	长2 16周	长3 16周	长4 16周	长5 16周	长6 16周	长7 16周	长8 16周	备注
通识教育课程	必修课	思政类	必修	2615A101	中国近现代史纲要 Outline of Contemporary Chinese History	3	48	32	16	2	4			2								
				2615A079	思想道德修养与法律基础 Morality Cultivation and General knowledge of Law	3	48	36	2	4	6				3							
				2615A080	马克思主义基本原理概论 Introduction to Fundamental Principles of Marxism	3	48	36	2	4	6					3						
				2615A102	毛泽东思想与中国特色社会主义理论体系概论 Introduction to Mao Zedong's Thought and Theoretical System of Socialism with Chinese Characteristics	3	48	32	16	4	8						4					
				26115201-26115204	形势与政策 Situation and Policy	2	32	32						0.5	0.5	0.5	0.5					长1-4讲座
		外语类	必修	5214A001-5214A002	大学英语2-3 College English 2-3	6	96	80		8	8	96		3	3							按相关规定实施分级教学，大学英语2-3与大学英语3-4两者选其一
				5214A002-5214A003	大学英语3-4 College English 3-4	6	96	80		8	8	96		3	3							
				5214A004 5201A005	工程师英语1-2 Engineer English 1-2	4	64	44		10	10	64				2	2					
		体育类	必修	1316A007-1316A010	体育1-4 Physical Education 1-4	4	144			144			1-4	2	2	2	2					
		数理基础类	必修	1011A095-1011A096	高等数学A1-A2 Advanced Mathematics A1-A2	10	160	106		32	22	240		6	4							
				1011A107	线性代数B Linear Algebra B	2	32	24		4	4	32			2							
				1011A113	概率论与数理统计A Probability Theory and Mathematical Statistics Level A	3	48	34		8	6	72				3						
				1012A110-1012A111	大学物理B1-B2 College Physics B1-B2	5	80	48		20	12	80				3	2					独立实验课
		创业	必修	3717A039	创业基础 Entrepreneurial Fundamental	2	32	32						2								
			必修	5115A087	大学语文 College Chinese	2	32	10	6	4	12		1或2	2								
				2717A122	大学生心理健康教育 Mental Health Education for College Students	1	16	8		4	4		1或2	2								
				31117082-31117083	大学生职业发展与就业指导1-2 Career planning and guidance for college students 1-2	1	16	16					3和6			0.5			0.5			一周实践课
	素质选	8个学分必			自然科学拓展课程群	2	32	32							2							建议数学建模、物理与人类文明、环…

课程设置与学时安排（表一）

专业名称：软件工程

课程类别	课程性质	课程代码	课程名称	学分	总学时	理论学时	实验学时实践	习题学时	研讨学时	课外学时	考试学期	长1 16周	长2 16周	长3 16周	长4 16周	长5 16周	长6 16周	长7 16周	长8 16周	备注
总修课	修，课程选修		至少选修6学分的除自然科学及工程技术之外的课程群	6	96	96								2	2	2				建议选经济、管理、法律以及艺术等
		通识教育类课程小计		62	1072	698	42	248	102	584	0	19.5	19.5	15	10.5	2	0.5	0	0	
学科专业基础课	必修	0221A009	计算机科学导论 Introduction to Computer Science	1.5	24	24				24		2								
		0221A010	程序设计基础 Fundamentals of Programming	3	48	48				96	1	3								独立实验课
		0225A002	离散数学 Discrete Mathematics	3	48	40	6	2		48	2			3						
		0225A004	数据结构 Data Structure	4	64	44	16	4		64	3			4						
		0225A005	数字逻辑 Digital Logical	3	48	36	8	4		48	3			3						
		0225A006	计算机组成 Computer Organization	3	48	36	8	4		48	4				3					
		0225A007	计算机网络 Computer Network	3	48	36	8	4		48	5					3				
		0225A009	操作系统原理 Principles of Operating System	4	64	56	8			56	5					4				
		学科基础课小计		24.5	368	296	54	18	0	432	23	5	0	10	3	7	0	0	0	
专业核心课	必修	0235A001	面向对象程序设计 Object-Oriented Programming	3.5	56	30	24		2	56	3		3.5							一周课程设计
		0235A002	数据库原理与应用 Principles and Application of Database System	3	48	30	16		2	48	4				3					
		0235A003	软件工程概论 Fundamentals of Software Engineering	3	48	36	8		4	48	4				3					
		0235A004	软件交互设计 Software Design and Interaction	3	48	30	16		2	48					3					一周课程设计
		0235A005	Web组件开发 Web Component Development	3	48	30	16		2	48					3					一周课程设计
		0235A006	软件质量保证与测试 Software Quality Assurance and Test	3	48	30	16		2	48	5					3				
		0235A007	软件体系结构 Software Architecture	3	48	36	8		4	48	6						3			
		0235A008	软件项目管理与案例分析 Software Project Management and Case Study	3	48	28	16		4	48	6						3			
		专业核心课小计		24.5	392	250	120	0	22	392	28	0	3.5	0	12	3	6	0	0	
	限选	0245B001	科技文献检索 Scientific Documents Retrieval	1	16	16				16								4		1-5周

课程设置与学时安排（表一）

专业名称：软件工程

课程类别	课程性质	课程代码	课程名称	学分	总学时	理论学时	实验学时实践	习题学时	研讨学时	课外学时	考试学期	长1 16周	长2 16周	长3 16周	长4 16周	长5 16周	长6 16周	长7 16周	长8 16周	备注
	选修模块	0245B002	知识产权与职业素养 Intellectual property rights and Career Quality	1	16	16				16								4		1-5周
			小计	2	32	32	0	0	0	32	0	0	0	0	0	0	0	8	0	
			至少选修学分	2	32	32	0	0	0	32	0	0	0	0	0	0	0	8	0	
	企业级开发	0245B011	基于JavaEE企业级开发技术 Enterprise Level Development Technology Based on JavaEE	3	48	30	16		2	48						3				
		0245B012	数据存储技术 Advanced Data Storage Technology	2.5	40	20	16		4	40						2.5				
		0245B013	系统集成及优化 System Integration and Optimization	2.5	40	20	16		4	40							2.5			
			小计	8	128	70	48	0	10	128	0	0	0	0	0	5.5	2.5	0	0	
			至少选修学分	8	128	70	48	0	10	128	0	0	0	0	0	5.5	2.5	0	0	
拓展复合课	专业拓展（按模块选修）	0245B021	移动应用开发基础（Andriod） Foundation of Mobile Devices Development（Andriod）	3	48	30	16		2	48						3				
	移动互联网	0245B022	移动应用开发拓展（Andriod） Extension of Mobile Devices Development（Andriod）	2.5	40	20	16		4	40							2.5			
		0245B023	移动应用开发基础（iOS） Foundation of Mobile Devices Development（iOS）	3	48	30	16		2	48						3				
		0245B024	移动应用开发拓展（iOS） Extension of Mobile Devices Development（iOS）	2.5	40	20	16		4	40							2.5			
		0245B025	跨平台脚本与开放平台技术 Cross Platform Script and Open Platform Technology	2.5	40	20	16		4	40						2.5				
			小计	13.5	216	120	80	0	16	216	0	0	0	0	0	8.5	5	0	0	
			至少选修学分	8	128	70	48	0	10	128	0	0	0	0	0	5.5	2.5	0	0	
			专业拓展至少选修学分	10	160	102	48	0	10	160	0	0	0	0	0	5.5	2.5	8	0	
拓展复合层次	专业复合（跨专业选修）	0245B031	电子商务概论 Introduction to E-Commerce	2	32	32											2			
		0245B032	算法设计与分析 Algorithm Analysis and Design	2	32	32										2				
		0245B033	多媒体技术与应用 Multimedia Technology and Application	2	32	32										2				
		0245B034	信息技术服务管理 Information Technology Service Management	2	32	32										2				
		0245B035	计算机系统安全 Computer System Security	2	32	32											2			
		0245B036	分布式计算技术 Distributed Computing	2	32	32											2			
		0245B037	人工智能 Artificial Intelligence	2	32	32											2			

课程设置与学时安排（表一）

专业名称：软件工程

课程类别	课程性质	课程代码	课程名称	学分	总学时	理论学时	实验学时实践	习题学时	研讨学时	课外学时	考试学期	第一学年		第二学年		第三学年		第四学年		备注
												长1 16周	长2 16周	长3 16周	长4 16周	长5 16周	长6 16周	长7 16周	长8 16周	
		0245B038	大数据分析与应用 Big Data Analysis and Application	2	32	32											2			
小计				16	256	256	0	0	0	0	0	0	0	0	0	6	10	0	0	
专业复合至少选修学分				6	96	96	0	0	0	0	0	0	0	0	0	2	4	0	0	
专业拓展复合至少选修学分合计				16	256	198	48	0	10	160	0	0	0	0	0	7.5	6.5	8	0	
理论教学学分学时合计				127	2088	1442	264	266	134	1568	51	24.5	23	25	25.5	19.5	13	8	0	

课程设置与学时安排（表一）

专业名称：软件工程

课程类别	课程性质	课程代码	课程名称	学分	总学时	理论学时	实验学时实践	习题学时	研讨学时	课外学时	考试学期	第一学年		第二学年		第三学年		第四学年		备注
												长1 16周	长2 16周	长3 16周	长4 16周	长5 16周	长6 16周	长7 16周	长8 16周	

实践教学安排（表二）

课程代码	所属模块	实践教学活动名称	学分	周或学时	长1	长2	短1	长3	长4	短2	长5	长6	短3	长7	长8	备注
					第一学年			第二学年			第三学年			第四学年		
31461014	公共实践	大学始业教育 Induction of University Life	1	1周	1周											
13461013		军事理论及训练 Military Theory and Training	4	4周	4周											
13461015		体质健康训练 Health Training	0.5	16								2				
31463007		思政社会实践 Ideological Social Practice	2	2周						2周						
31467084		大学生职业发展与就业指导实践 Practice of career planning and guidance for college students	1	22					22							
1012A022	基础实验	大学物理实验B Experiment of college physics Level B	1	33		33										
0261A216		程序设计基础实验 Experiments in Fundamentals of Programming	1	32	2											
0254A501	专项设计	Java程序课程设计 Course Design of Java Programming	1	1		1										
0254A502		软件交互课程设计 Course Design of of Software Interaction	1	1						1						
0254A503		Web组件开发课程设计 Course Design of Web Component Development	1	1						1						
0254A504		基于软件过程的综合课程设计 Course Design of Software Development Based on Procedure Management	2.5	2.5									2.5			
0251A501	专业实践	认识实习 Cognition Practice	1	1						1						
0253A501		技术实习 Technology Practice	10	10									10			6-15周
0255A501		毕业设计（论文） Graduate Project (Thesis)	16	16										16		1-16周
0277A501	创新实践	第二课堂 Extracurricular Teaching	3													学科竞赛、创新训练、科研项目、开放实验等
合计			46													

第一学期	高等数学A1　　　　　C语言实
第二学期	物理实验 ← 大学物理B1　高等数学A2　线性代数B　离
第三学期	大学物理B2 → 数字逻辑　概率论与数理统计A → 数据结构
第四学期	软件工程概论　计算机组成　数据库原理与应用 → Web组件开发
第五学期	软件质量保证与测试　操作系统原理 → 计算机网络　基于
第六学期	软件体系结构 → 软件项目管理与案例分析　基于软件过程的综合课程设计
第七学期	知识产权与职业素养
第八学期	毕业设计

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实验 ←── 程序设计基础（C语言）          大学英语1      专业导论1

离散数学                                大学英语2      专业导论2

                面向对象程序设计  课程    工程英语1
                                  设计

课程      软件交互与设计  课程        工程英语2      认知实习
设计                      设计

┌─────────────────────┐ ┌──────────────────────────────┐
│ javaEE企业级开发技术  │ │ 跨平台脚本与开放平台技术        │
│                     │ │                              │
│   数据存储技术        │ │  移动开发基础(android/iOS)     │
│                     │ │                              │
│   系统集成与优化      │ │  移动开发拓展(android/iOS)     │
└─────────────────────┘ └──────────────────────────────┘

                          科技文献检索    技术实习
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其它各类拓展性课程