

计算机科学与技术专业辅修培养方案

Minor Program of Computer Science and Technology

一、培养目标 Objectives

本专业旨在培养适应国民经济与科技发展的需求的、德智体美全面发展的、具备较好的科学素养，扎实的专业基础知识，较强的工程实践能力和创新能力，良好的职业道德和人文素养，能够在计算机科学与技术及其相关应用领域从事科研教学、产品研发、系统设计及应用管理的高级专业人才，应达到以下具体目标：

(1) 熟悉职业相关的国家法律法规，具有社会和职业道德修养，适应团队工作环境。

(2) 针对实际需求，能运用自然科学、工程基础和计算机专业知识，对复杂计算机系统工程问题进行分析，研究解决方案，承担计算机系统的设计、开发和应用管理任务。

(3) 有良好的国际视野，且具有与业界同行、专业客户和公众沟通交流的能力，以及组织协调和团队合作的能力。

(4) 有在工作中继续学习、不断更新知识以适应技术和职业发展需求的能力。

This major aims to cultivate talents who can adapt to the needs of national economic and technological development, with comprehensive development in morality, intelligence, physical fitness, and aesthetics. The graduates should possess a good scientific literacy, solid professional foundational knowledge, strong engineering practical abilities, and innovation capabilities, as well as good professional ethics and humanistic qualities. They should be capable of engaging in scientific research, teaching, product development, system design, and application management in the field of computer science and technology and its related application areas. The specific objectives to be achieved are as follows:

(1) Be familiar with professional laws and regulations related to occupations, have social and professional ethics, and adapt to the working environment of the team.

(2) According to practical needs, be able to apply natural science, engineering fundamentals and computer science expertise to analyze and solve complex engineering problems, be able to undertake the design, development and application management tasks of computer systems.

(3) Have good international vision and communication skills with industry peers, professional customers and the public, as well as organizational coordination and teamwork capabilities.

(4) Be able to continue to learn and update knowledge in order to meet the needs of technical and vocational development.

二、培养要求 Requirement

对于本专业的学生，培养要求包括如下 12 项基本要求：

(1) 工程知识：掌握从事计算机专业领域工作所需要的数学、自然科学、工程基础和专业知识，并能够运用这些知识解决复杂计算机系统工程问题。

(2) 问题分析：能够应用数学、自然科学和计算机工程科学的基本原理，识别、表达复杂计算机系统工程问题，并能通过文献研究分析，获得有效结论。

(3) 设计/开发解决方案：能够设计针对复杂计算机系统工程问题的解决方案，开发满足特定需求的计算机系统、单元（模块），具有一定的创新意识，并在设计中考虑社会、健康、安全、法律、文化及环境等因素。

(4) 研究：具有基于科学原理并采用科学方法对复杂计算机系统工程问题进行研究的能力，包括设计与实施实验、分析与解释数据、并通过信息综合得到合理有效结论。

(5) 使用现代工具：能够选择与使用恰当的技术、资源、开发环境或开发相关工具，对复杂计算机系统工程问题进行模拟和预测，并能够分析和理解其局限性。

(6) 工程与社会：在复杂计算机系统工程问题解决方案的设计和实现中，能够根据具体的工程背景合理分析和评价其对社会、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：在复杂计算机系统工程问题解决方案的设计、实现过程及系统运行中，能够理解和评价其对环境、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和社会责任感，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：具有一定的组织管理能力、团队合作能力，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：能够就复杂计算机系统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，并具有一定的国际视野和跨文化交流能力。

(11) 项目管理：理解并掌握计算机系统工程管理原理与经济决策方法，具有在多学科环境中应用的能力。

(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。

For students of this major, the cultivation requirements include the following 12 basic items:

(1) Engineering knowledge: Master the knowledge of mathematics, natural science, and engineering fundamentals required for work in the area of computer science and technology, and apply these knowledge to solve complex computer system engineering problems.

(2) Problem analysis: Capable of applying the fundamental principles of math, natural science and computer engineering science to identify, formulate, and analyze complicated computer system engineering problems, and draw a valid conclusion through literature research.

(3) Design/development of solutions: Ability to design solutions for complex computer system engineering, and to develop computer systems, units (modules) that meet specified needs with sense of innovation and with appropriate considerations for society, health, safety, law, culture, environment, etc.

(4) Research: can use science methods to carry on research on complicated computer system engineering problems based on scientific principles, including designing experiments, analyzing and interpreting data as well as drawing reasonable conclusions from their achieved information.

(5) Modern Tool Usage: Ability to select and apply appropriate techniques, resources, development environment and related development tools to predict and simulate complicated computer system engineering problems, with an understanding of the limitations.

(6) Engineering and society: In the design and implementation of complex computer system engineering problem solutions, be able to carry out rationality analysis based on relevant engineering background knowledge and evaluate the impacts on the society, health, security, law, culture and environment; have a clear understanding of their responsibilities.

(7) Environment and sustainable development: In the design, implementation process and system operation of complex computer system engineering problem solution, can understand and evaluate some complicated engineering practices' influence on environment and its sustainable development.

(8) Occupational norms: have humanistic and social science literacy as well as social responsibility, understand and comply with engineering professional ethics and norms in engineering practice and fulfill responsibilities.

(9) Individual and Team work: Have certain organizational management ability, team cooperation ability, and can work as individuals, team members as well as team leaders in the teams with multidisciplinary backgrounds.

(10) Communication: can communicate effectively over complicated computer system engineering problems with both industry peers and the general public, including writing reports,

designing documents, giving presentations, clearly presenting or responding to instructions; can see into problems in an international perspective and communicate with people of different cultural backgrounds.

(11) Project management: Understand and master computer system engineering management principles and economic decision-making methods, being able to apply them in a multidisciplinary environment.

(12) Lifelong learning: have the consciousness of independent learning and lifelong learning and the ability of continuous learning and adapting to development.

毕业要求对培养目标的支撑关系

The Support Relationship of Graduation Requirements for Cultivation Objectives

毕业要求 Graduation Requirements	培养目标 Training Objectives			
	目标 1 Objective 1	目标 2 Objective 2	目标 3 Objective 3	目标 4 Objective 4
毕业要求 1: 工程知识 Graduation Requirements 1: Engineering Knowledge		√		√
毕业要求 2: 问题分析 Graduation Requirements 2: Problem Analysis		√		
毕业要求 3: 设计/开发解决方案 Graduation Requirements 3: Design/development of solutions		√		
毕业要求 4: 研究 Graduation Requirements 4: Investigation		√		√
毕业要求 5: 使用现代工具 Graduation Requirements 5: Modern Tool Usage		√		√
毕业要求 6: 工程与社会 Graduation Requirements 6: The Engineer and Society	√		√	
毕业要求 7: 环境和可持续发展 Graduation Requirements 7: Environment and Sustainability	√		√	
毕业要求 8: 职业规范 Graduation Requirements 8: Ethics	√			
毕业要求 9: 个人和团队 Graduation Requirements 9: Individual and Team work	√		√	
毕业要求 10: 沟通 Graduation Requirements 10: Communication			√	
毕业要求 11: 项目管理 Graduation Requirements 11: Project Management and Finance		√		
毕业要求 12: 终身学习 Graduation Requirements 12: Lifelong learning				√

三、学分要求 Credits Requirements

38 学分。

38 credits.

四、课程设置 Course Programs

课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	学分 Credits	开课学期 Semester	开课学院 School	备注 Notes
数学类 Mathematics Courses	离散数学 Discrete Mathematics	必修 Compulsory	4	第 2 学期 Semester 2	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	数据结构 A Data Structure A	必修 Compulsory	4	第 3 学期 Semester 3	计算机与人工智能学院 School of Computing and Artificial Intelligence	
专业基础类 Specialized Basic Courses	编译原理 Compilation Principle	必修 Compulsory	3	第 4 学期 Semester 4	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	计算机组成原理(含实验) Computer Composition Principle (with Experiments)	必修 Compulsory	4	第 4 学期 Semester 4	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	算法分析与设计(含实验) Algorithm Analysis and Design (with Experiments)	必修 Compulsory	3	第 4 学期 Semester 4	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	操作系统(含实验) Operating System (with Experiments)	必修 Compulsory	4	第 4 学期 Semester 4	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	计算机网络 Computer Networks	必修 Compulsory	3	第 5 学期 Semester 5	计算机与人工智能学院 School of Computing and Artificial Intelligence	

	计算机网络工程实验 Computer Network Engineering Experiments	必修 Compulsory	1	第 5 学期 Semester 5	计算机与人工智能学院 School of Computing and Artificial Intelligence	
专业核心课 Specialized Core Courses	数据库原理与设计(含实验) Principle and design of database(with Experiments)	必修 Compulsory	4	第 4 学期 Semester 4	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	微机与接口技术(含实验) Microcomputer and interface technology(with Experiments)	必修 Compulsory	4	第 5 学期 Semester 5	计算机与人工智能学院 School of Computing and Artificial Intelligence	
	软件系统综合课程设计 Software System Comprehensive Course Design	必修 Compulsory	4	第 6 学期 Semester 6	计算机与人工智能学院 School of Computing and Artificial Intelligence	
总学分 Total Credits			38			