

# 计算机科学与技术专业卓越班培养方案

## Undergraduate Program for Excellent Class of Computer Science and Technology Major

### I. 专业介绍 Introduction

我校计算机科学与技术专业在全国大学本科教育专业排行 A+ 级。自 1960 年创办了“计算技术”专业以来，1981 年专业在国内首批获得“计算机应用”学科硕士学位授予权。1987 年该学科成为铁道部的重点学科。2003 年获计算机应用技术学科博士学位授予权，2006 年获计算机科学与技术一级学科硕士学位授予权，2010 年获计算机科学与技术一级学科博士学位授予权，2016 年教育部学科评估 B+，2020 年进入 ESI 全球排名前 3‰，2019 年入选首批国家一流本科专业建设点，是国家级特色专业，已连续 3 次通过工程教育专业认证（2012-2025）。

计算机科学与技术专业旨在培养德、智、体、美全面发展，具备基本的科学素养，系统掌握计算机科学与技术基本理论和专业知识，掌握铁路信息技术基础知识与方法，拥有较好的实践动手能力、系统分析与开发能力，适应社会经济发展需要的专门人才。毕业后，可从事应用研究、技术开发或管理等工作，并有在工作中继续学习、不断更新知识的能力。毕业生就业率保持在 98% 以上，就业单位主要包括知名 IT 企业、国有大中型企业、事业单位和科研院所等。

The Computer Science and Technology Major in our university ranks A+ in the national undergraduate education. Since the establishment of the major of "Computing Technology" in 1960, it was among the first to be empowered to confer master degree in the discipline of "Computer Application" in 1981, and became the key discipline of the Ministry of Railways in 1987. Our major was granted the right to confer doctoral degree in the discipline of Computer Application Technology in 2003, master degree in the first-level discipline of Computer Science and Technology in 2006, doctoral degree in the first-grade discipline of Computer Science and Technology in 2010, and was ranked B+ in the latest fourth round of discipline evaluation by the Ministry of Education. By 2020, it has ridden into the top 3‰ in ESI (Essential Science Indicators) worldwide, and was selected as one of the first batch of national first-class undergraduate program construction points in 2019. As a national characteristic specialty, it has passed the accreditation of engineering education majors for three consecutive times (2012-2025).

The Computer Science and Technology program aims to cultivate students so that they will become professional talents meeting the demand of social and economic development with comprehensive development in personality, fundamental research abilities, systematical master of the fundamental theories and professional knowledge in the field of computer science and technology, and appropriate capability in practice, analysis and development. The employment rate for graduates is beyond 98%, where graduates are primarily working for well-known IT enterprises, large- and medium-sized state-owned companies, public institutions, and scientific research institutions.

专业代码: 080901

Program Code: 080901

专业名称: 计算机科学与技术

Program Name: Computer Science and Technology

## II. 培养目标 Objectives

我校计算机科学与技术专业卓越班旨在面向新一代信息技术产业发展需求, 培养德、智、体、美全面发展, 系统掌握计算机科学与技术基本理论和专业知识, 掌握铁路信息技术基础知识与方法, 拥有扎实的实践动手能力、系统分析、开发能力和创新能力, 并具备良好的人文社会科学素养、职业道德和社会责任感, 适应社会经济发展需要的复合型高素质专门人才, 成为社会主义事业建设者和接班人。

The Computer Science and Technology Major program for Excellent Class of our university aims to meet the development needs of the new generation of information technology industry, and cultivate compound high-quality professionals with all-round development of morality, intelligence, physique and aesthetics, who systematically master the basic theory and professional knowledge of computer science and technology, as well as the basic knowledge and methods of railway information technology. They possess solid practical ability, ability of systematical analysis, development and innovation, good humanities and social science literacy, professional ethics and social responsibility, thus they are well-equipped to meet the needs of social and economic development, and become socialist cause builders and successors.

毕业生经过实践锻炼, 能够达到以下目标:

After practicing, the graduates can achieve the following goals:

(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。

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) 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。

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) 有组织协调能力, 能与业界同行、专业客户和公众进行有效沟通。

Have organizational and coordination skills, be able to communicate effectively with industry peers, professional customers and the public.

(4) 具有继续学习能力, 能适应技术和职业发展需求。

Have the ability to continuous learning and adapt to technical and professional development needs.

## III. 专业毕业要求 Graduation Requirements

对于本专业的学生, 毕业要求包括如下 12 项基本要求:

The graduates are required to meet the following 12 essential requirements:

(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。

(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) 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。

(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) 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，并在设计中考考虑社会、健康、安全、法律、文化及环境等因素。

(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) 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。

(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) 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。

(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) 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。

(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) 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。

(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) 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。

(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) 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。

(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) 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。

(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) 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。

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

(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) 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				
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#### IV.学制与学位 Duration and Degree

学制：四年

Duration: Four years

学位：工学学士

Degree: Bachelor of Engineering

#### V.主干学科与主干课程 Main Subject and Main Course

主干学科：计算机科学与技术

**Main Subject:** computer science and technology

**主干课程:** 离散数学, 高级语言程序设计, 数字电子技术, 数据结构, 算法分析与设计, 计算机组成原理, 操作系统, 数据库原理与设计, 微机与接口技术, 计算机网络, 软件系统设计与应用, 人工智能, 智能嵌入式系统

**Main Course:** Discrete Mathematics, Advanced Programming Language, Digital Electronic Technique, Data Structure, Analysis and design of algorithms, Principles of Computer Composition, Operating System, Principle and design of database, Microcomputer and interface technology, Computer Networks, Design and application of software system, Artificial Intelligence, Intelligent Embedded System

#### VI.毕业学分基本要求 Basic Requirements of Credits for Graduation

课程体系 Curriculum System		学分要求 Credits Requirements					
		必修 Compulsory		限修 Distributional Electives		选修 Free Electives	
		理论 Theory	实践 Practice	理论 Theory	实践 Practice	理论 Theory	实践 Practice
公共基础课程 Public Basic Courses	思想政治类 Ideological Politics Courses	15	2				
	军事类 Military Courses	2	2				
	外语类 Foreign Language Courses	6		2			
	体育类 Physical Education Courses		4				
通识教育课程 General Education Courses	核心通识课 Core General Education Courses			4			
		小计 Subtotal					
		17					
		4					
		8					
		4					
		4					

	新生研讨课 Freshman Seminar			2				2
学科与专业基础课程（含实验） Discipline and Specialty Foundational Courses (Including Experiments)	数学与自然科学基础课 Foundational Courses on Mathematics and Natural Science	26	2					28
	专业基础课 Professional Foundational Courses	13	3					16
	工程基础课 Engineering Foundational Courses	9	2					11
专业课程（含实验） Specialized Courses (Including Experiments)	专业核心课程 Specialized Core Course	25	7					32
	专业限修课程 Specialized Restricted Courses			10	2			12
实习实践教学 Practice Courses	基本技能训练、实习实训、综合课程设计、社会与文化素质实践、毕业实习与毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design		19					19
多元化课程 Diversified Courses	跨学科课程、美育专业类课程、学科竞赛类课程、其它个性化选修课程等 Interdisciplinary Courses, Aesthetic Education Courses, Subject Competition Courses, other Personalized Elective Courses, etc			4				4
创新创业实践 Innovation and Entrepreneurship Practice	创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等 Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc		2					2
必修环节 A Compulsory Part	大学生综合素质提升、学生体质达标测评 Comprehensive Quality Improvement Courses for College							0

	Students, Assessment of Students' Physical Fitness							
总 计 Total								163

## VII.课程设置细化表 Course Programs Table

公共基础课程 Public Basic Courses 共 33 学分，其中必修 31 学分，限修 2 学分，选修 0 学分 A total credits of 33, including 31 for compulsory courses, 2 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class Practice Credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
思想政治类 Ideological Politics Courses	思想道德与法治 Ideological and Moral Education and the Rule of Law	必修 Compulsory	3	0.4	第 1 学期 1St Semester	马克思主义学院 School of Marxism	6, 7, 8	
思想政治类 Ideological Politics Courses	中国近现代史纲要 Conspectus of Chinese Modern History	必修 Compulsory	3	0.4	第 2 学期 2Nd Semester	马克思主义学院 School of Marxism	7, 8	
	马克思主义基本原理 The Basic Principles of Marxism	必修 Compulsory	3	0.4	第 3 学期 3Rd Semester	马克思主义学院 School of Marxism	8	
	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics	必修 Compulsory	3	0.4	第 5 学期 5Th Semester	马克思主义学院 School of Marxism	6, 7, 8	
	习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	必修 Compulsory	3	0.4	第 6 学期 6Th Semester	马克思主义学院 School of Marxism	6, 7, 8	
	形势与政策 I Situation and Policy I	必修 Compulsory	0	0	第 1 学期 1St Semester	马克思主义学院 School of Marxism	6, 7, 8	
	形势与政策 II Situation and Policy II	必修 Compulsory	0	0	第 2 学期 2Nd Semester	马克思主义学院 School of Marxism		
	形势与政策 III Situation and Policy III	必修 Compulsory	0	0	第 3 学期 3Rd Semester	马克思主义学院 School of Marxism		
	形势与政策 IV Situation and Policy IV	必修 Compulsory	0	0	第 4 学期 4Th Semester	马克思主义学院 School of Marxism		
	形势与政策 V Situation and Policy V	必修 Compulsory	0	0	第 5 学期 5Th Semester	马克思主义学院 School of Marxism		

						Marxism		
	形势与政策Ⅵ Situation and Policy Ⅵ	必修 Compulsory	0	0	第 6 学期 6Th Semester	马克思主义学院 School of Marxism		
	形势与政策Ⅶ Situation and Policy Ⅶ	必修 Compulsory	0	0	第 7 学期 7Th Semester	马克思主义学院 School of Marxism		
	形势与政策Ⅷ Situation and Policy Ⅷ	必修 Compulsory	2	0	第 8 学期 8Th Semester	马克思主义学院 School of Marxism		
军事类 Military Courses	军事理论 Military Theories	必修 Compulsory	2	0	第 1 学期 1St Semester	武装部 Security Office	9	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short Semester1	武装部 Security Office	9	
外语类 Foreign Language Courses	英语 I College English I	必修 Compulsory	2	0	第 1 学期 1St Semester	外国语学院 School of Foreign languages	10	
	英语 II College English II	必修 Compulsory	2	0	第 2 学期 2Nd Semester	外国语学院 School of Foreign languages	10	
	通用学术英语 English for General Academic Purposes	必修 Compulsory	2	0	第 3 学期 3Rd Semester	外国语学院 School of Foreign languages	10	
外语类 Foreign Language Courses	职场英语 Workplace English	限修 Distributional Elective	2	0	第 4 学期 4Th Semester	外国语学院 School of Foreign languages	10	限选 1 门， 2 学分 Limited to 1 course, 2 credits
	交际与文化视听说 Viewing, Listening & Speaking in English -- Communication & Culture							
	语言、文化与翻译 Language, Culture and Translation							
	英语公共演讲 Public Speaking in English							
体育类 Physical Education Courses	体育 I Physical Education I	必修 Compulsory	1	1	第 1 学期 1St Semester	体育部 Dept. of Physical Education	9	
	体育 II Physical Education II	必修 Compulsory	1	1	第 2 学期 2Nd Semester	体育部 Dept. of Physical Education		
	体育Ⅲ Physical Education III	必修 Compulsory	0.5	0.5	第 3 学期 3Rd Semester	体育部 Dept. of Physical Education		
	体育Ⅳ Physical Education IV	必修 Compulsory	0.5	0.5	第 4 学期 4Th Semester	体育部 Dept. of Physical Education		
	体育健康课程 I Diversified Physical Education Courses I	必修 Compulsory	0.5	0.5	第 5 学期 5Th Semester	体育部 Dept. of Physical Education	6	
	体育健康课程 II Diversified Physical Education Courses II	必修 Compulsory	0.5	0.5	第 6 学期 6Th Semester	体育部 Dept. of Physical Education		
通识教育课程 General Education Courses								
共 6 学分，其中必修 0 学分，限修 6 学分，选修 0 学分 A total credits of 6, including 0 for compulsory courses, 6 for distributional electives and 0 for free electives								
课程类型	课程名称	课程性质	总学分	课内实	开课学期	开课学院	支撑毕业要求	备注



Course Type	Course Name	Nature of Course	Credits	践学分 In-class practice credits	Semester	School	指标点 Indicators which Support Graduation Requirements	Notes
核心通识课 Core General Education	“交通天下” 通识课程 General Studies on Transportation	限修 Distributional Elective	4		2-8 学期 2-8 Semester	全校 The whole school	6	
新生研讨课 Freshman Seminar	计算机学科前沿导论 Introduction to the frontier of computer science	限修 Distributional Elective（选 1 门 Select one）	2		第 1 学期 1St Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	8, 9, 10, 12	
	软件学科前沿导论 Introduction to the frontier of software science							
学科与专业基础课程（含实验） Discipline and Specialty foundational Courses (Including Experiments) 共 55 学分，其中必修 55 学分，限修 0 学分，选修 0 学分 A total credits of 55 ， including 55 for compulsory courses, 0 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
数学与自然科学 基础课 Foundational Courses on Mathematics and Natural Science	高等数学 I Advanced Mathematics I	必修 Compulsory	5		第 1 学期 1St Semester	数学学院 School of Mathematics	1	
	线性代数 B Linear Algebra B	必修 Compulsory	3		第 1 学期 1St Semester	数学学院 School of Mathematics	1	
	高等数学 II Advanced Mathematics II	必修 Compulsory	5		第 2 学期 2Nd Semester	数学学院 School of Mathematics	1	
	离散数学 Discrete mathematics	必修 Compulsory	4		第 2 学期 2Nd Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1	
	概率论与数理统计 Probability and Mathematical Statistics	必修 Compulsory	3		第 3 学期 3Rd Semester	数学学院 School of Mathematics	1	
	大学物理 BI College Physics BI	必修 Compulsory	3		第 2 学期 2Nd Semester	物理科学与技术学院 School of Physical Science and Technology	1	
	大学物理实验 I Experiments in College Physics I	必修 Compulsory	1	1	第 2 学期 2Nd Semester	物理科学与技术学院 School of Physical Science and Technology	4	
	大学物理 BII College Physics BII	必修 Compulsory	3		第 3 学期 3Rd Semester	物理科学与技术学院 School of Physical Science and	1	

						Technology		
	大学物理实验 II Experiments in College Physics II	必修 Compulsory	1	1	第 3 学期 3Rd Semester	物理科学与技术学院 School of Physical Science and Technology	4	
专业基础课 Professional Foundational Courses	面向对象程序设计 Object-oriented Programming	必修 Compulsory	2		第 2 学期 2Nd Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 3, 5	
	数据结构 A Data Structure A	必修 Compulsory	4		第 3 学期 3Rd Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 2, 3	
	数据结构实验 Experiments for Data Structure	必修 Compulsory	1	1	第 3 学期 3Rd Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	2, 4	
	计算机组成原理 A Principles of Computer Composition A	必修 Compulsory	4		第 4 学期 4Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 2, 3	
	计算机组成实验 Experiments for Principles of Computer Composition	必修 Compulsory	1	1	第 4 学期 4Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	2, 3, 5	
	操作系统 Operating System	必修 Compulsory	3		第 4 学期 4Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 2, 10	
	操作系统实验 Experiments for Operating System	必修 Compulsory	1	1	第 4 学期 4Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	4, 5	
工程基础课 Engineering Foundational Courses	高级语言程序设计 Advanced Programming Language	必修 Compulsory	4	0.5	第 1 学期 1St Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 2, 3	
	电路与电子技术 Circuit and electronic technology	必修 Compulsory	3	0.5	第 3 学期 3Nd Semester	信息科学与技术学院 School of Information Science and Technology	1, 4	
	数字电子技术 B Digital Electronic Technique B	必修 Compulsory	3		第 3 学期 3Rd Semester	信息科学与技术学院 School of Information Science and Technology	1, 2	
	数字电子技术实验 Experiments for Digital	必修 Compulsory	1	1	第 3 学期 3Rd	信息科学与技术学院 School	4, 5	

	Electronic Technology				Semester	of Information Science and Technology		
<b>专业课程（含实验）</b> <b>Specialized Courses (Including Experiments)</b> 共 44 学分，其中必修 32 学分，限修 12 学分，选修 0 学分 A total credits of 44, including 32 for compulsory courses, 12 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实 践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
专业核心课程 Specialized Core Course	数据库原理与设计 Principle and design of database	必修 Compulsory	3		第 4 学期 4Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	1, 2	
	数据库原理与设计实验 Experiments for Principle and design of database	必修 Compulsory	1	1	第 4 学期 4Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	1, 3, 5	
	算法分析与设计 B Analysis and design of algorithms B	必修 Compulsory	2		第 4 学期 4Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3	
	算法分析与设计实验 Experiments for analysis and design of algorithms	必修 Compulsory	1	1	第 4 学期 4Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	4	
	微机与接口技术 A Microcomputer and interface technology A	必修 Compulsory	4		第 5 学期 5Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	1, 2, 3, 10	
	微机与接口技术实验 Experiments for microcomputer and interface technology	必修 Compulsory	1	1	第 5 学期 5Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3, 5	
	计算机网络 Computer Networks	必修 Compulsory	3		第 5 学期 5Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	1, 2	
	计算机网络工程实验 Experiments for Computer Network Engineering	必修 Compulsory	1	1	第 5 学期 5Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3, 10	

	计算机图形学 Computer Graphics	必修 Compulsory	2		第 5 学期 5Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 3	
	计算机图形学实验 Experiments for Computer Graphics	必修 Compulsory	1	1	第 5 学期 5Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	5	
	智能嵌入式系统设计 Intelligent Embedded System Design	必修 Compulsory	2		第 6 学期 6Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 2, 11	必须包含课程设计, 完成有一定规模的系统设计与开发。 Course projects must be included, in which the student must complete the design and development of systems of a certain scale.
	智能嵌入式系统设计实验 Intelligent Embedded System Design Experiment	必修 Compulsory	1	1	第 6 学期 6Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	2, 3	
	软件系统设计与应用 Design and application of software system	必修 Compulsory	4	1	第 6 学期 6Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 3, 9, 11	
	人工智能 Artificial Intelligence	必修 Compulsory	2		第 7 学期 7Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	4, 5, 12	
	数据挖掘 Data Mining	必修 Compulsory	2		第 7 学期 7Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	4, 5, 12	
	数字图像处理 Digital image processing	必修 Compulsory	2		第 7 学期 7Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	4, 5, 12	
专业限修课程 Specialized Restricted Courses	互联网搜索引擎 Internet search engine	限修 Distributional Elective	3	1	第 6 学期 6Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 3, 12	限修 6 学分 (专业限选 1 组) Limited to 6 credits
	人机交互与动漫游戏 Human-Computer Interaction and Animation Games	限修 Distributional Elective	3	1	第 6 学期 6Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	1, 3, 12	

	机器学习 B machine learning B	限修 Distributional Elective	2	0	第 6 学期 6Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	1, 3, 12	限修 6 学分 (专业限选 2 组) Limited to 6 credits
	机器学习实验※ Machine Learning Experiment		1	1	第 6 学期 6Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence		
	云计算与并行技术 Cloud computing and parallel technologies	限修 Distributional Elective	2	0	第 7 学期 7Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3, 7, 11, 12	
	机器人技术 Robot technology	限修 Distributional Elective	2	0	第 7 学期 7Th Semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3, 7, 11, 12	
	脑科学与认知智能 Brain Science and Cognitive Intelligence	限修 Distributional Elective	2	0	第 6 学期 6Th semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3, 7, 11, 12	
	自然语言处理 Natural language processing	限修 Distributional Elective	2	0	第 6 学期 6Th semester	计算机与人工 智能学院 School of Computing and Artificial Intelligence	2, 3, 7, 11, 12	

**实习实践教学**  
**Practice Course**

共 19 学分，其中必修 19 学分，限修 0 学分，选修 0 学分  
A total credits of 19, including 19 for compulsory courses, 0 for distributional electives and 0 for free electives

课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实 践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
基本技能训练、 实习实训、综合 课程设计、社会 与文化素质实 践、毕业实习与 毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and	软件设计实习 Software design internship	必修 Compulsory	2	2	短 1 学期 Short Semester 1	计算机与人工 智能学院 School of Computing and Artificial Intelligence	5, 7, 8, 11	
	智能计算硬件平台构建综 合实习 Comprehensive Internship of Intelligent Computing Hardware Platform Construction	必修 Compulsory	2	2	短 2 学期 Short Semester 2	计算机与人工 智能学院 School of Computing and Artificial Intelligence	3, 5, 8, 10	
	计算机科学与技术专业工 程实习 Engineering Internship of Computer Science and Technology Major	必修 Compulsory	2	2	短 3 学期 Short Semester 3	计算机与人工 智能学院 School of Computing and Artificial Intelligence	3, 6, 7, 9, 11	

Graduation Design	毕业设计 A Diploma project A	必修 Compulsory	13	13	第 8 学期 8Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	2, 3, 4, 5, 6, 7, 10, 11, 12	
多元化课程 Diversified course 共 4 学分，其中必修 0 学分，限修 4 学分，选修 0 学分 A total credits of 4, including 0 for compulsory courses, 4 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes
跨学科课程 Interdisciplinary Courses	电子机械动起来 Play with electronics and machinery	限修 Distributional electives	2	2	第 5 学期 5Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	2, 6, 9, 12	限修 4 学分 limited to 4 credits
	从代码到实物：造你所想 From code to implementation: make what you want		2	2	第 4 学期 4Th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	2, 6, 9, 12	
	智能+交通 Intelligence+Transportation		2	0	第 6 学期 6Th semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	6, 7, 9	
	智慧土木：比特与混凝土的艺术 Intelligent Civil Engineering: Art of Bit and Concrete		2	0	第 6 学期 6th Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence	6, 7, 9	
创新创业实践 Innovation and Entrepreneurship Practice 共 2 学分，其中必修 2 学分，限修 0 学分，选修 0 学分 A total credits of 2, including 2 for compulsory courses, 0 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求 指标点 Indicators which Support Graduation Requirements	备注 Notes

创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等 Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc	课外创新实践 Extracurricular innovative practice	必修 Compulsory	2	2	3-8 学期 3-8 Semester	计算机与人工智能学院 School of Computing and Artificial Intelligence		按照《西南交通大学创新实践学分认定与管理办法》规定修习 Study in accordance with the Regulations on Credit Recognition and Management of Innovation Practice in Southwest Jiaotong University
<b>必修环节</b> <b>A compulsory part</b> 共 0 学分，其中必修 0 学分，限修 0 学分，选修 0 学分 A total credits of 0, including 0 for compulsory courses, 0 for distributional electives and 0 for free electives								
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class practice credits	开课学期 Semester	开课学院 School	支撑毕业要求指标点 Indicators which Support Graduation Requirements	备注 Notes
大学生综合素质提升、学生体质达标测评 Comprehensive Quality Improvement Courses for College Students, Assessment of Students' Physical Fitness	大学生综合素质提升（第二、第三课堂） Comprehensive Quality Improvement Courses for College Students (The Second and Third Classroom)	必修 Compulsory	0	0	1-8 学期 1-8 Semester	校团委 Communist Youth League Committee	6.1, 8.2	
	学生体质达标测评 Assessment of Students' Physical Fitness	必修 Compulsory	0	0	秋季学期 fall Semester	体育部 Dept. of Physical Education		
学分总计 Total Credits			163					