计算机科学与技术专业
Computer Science and Technology

一、培养目标

Ⅰ.Training Objectives

本专业立足广西、面向全国，培养德智体美劳全面发展的计算机科学与技术领域工程应用型专门人才。毕业生掌握深入的计算机科学与技术专业知识，具有良好的计算思维能力、程序设计能力、算法设计与分析能力，能将数学、自然科学、工程基础和计算机专业知识应用于计算系统的设计、开发和应用；具有良好的沟通交流和团队协作能力，具有创新能力和国际视野，能够在关于复杂计算系统的技术研究、设计开发、工程应用、维护管理中发挥主导作用；具有家国情怀和社会责任感，具有进取精神和求实精神，具有良好的人文素养、数字素养、社会道德和职业道德，具有计算系统安全意识、工程伦理意识、法治意识和生态意识，能够终身学习以适应计算机技术和经济社会发展的需要。经过毕业五年左右的工作实践，能独立承担复杂工程项目任务，成为项目团队的核心成员或团队负责人。

The major of Computer Science and Technology, which bases in Guangxi and serves the whole country, is committed to the cultivation of practical talents in computer science and engineering. Aside from all-rounded development of morality, intelligence, physical fitness, aesthetics and diligence, graduates of this major are expected to have a good understanding of basic principles of computer engineering technology and the ability of computational thinking, the ability of programming and algorithm design and analysis. These capabilities may allow them to apply mathematics, natural science, engineering foundation and computer knowledge to engineering practice. They have good communication and team cooperation ability, innovative ability and international vision, and can play a leading role in the technical research, design and development, engineering application, maintenance and management of complicated computing systems. In order to meet the needs of advancement of computer technology and socio-economic development, the graduates are also cultivated with the feelings of family and nation, the sense of social responsibility, enterprising spirit and realistic spirit, the consciousness of humanism accomplishment, digital literacy, socio-professional ethics, with the concept of team spirit and collaboration, with the awareness of innovativeness and international perspective, with the awareness of computer system security, engineering ethics, legacy and ecology, with the ability of active learning. All the capabilities may lead these graduates to deploy their ingenuity in the computational system related fields of technical research, design and development, engineering application, maintenance and management. By about five-years

of working practices, the graduates should be able to independently undertake complex projects and become a core member or leader of the team.

二、专业特色

Ⅱ. Major Features

本专业始建于 1980 年，原名为电子计算机专业，于 1981 年下半年正式开始招收本科生，是广西壮族自治区最早开办的计算机本科专业。1985 年更名为计算机及应用专业，1998 年与计算机软件专业合并为计算机科学与技术专业。

Founded in 1980, the major, formerly known as the Electronic Computer, began to recruit undergraduates in the second half of 1981. It is the earliest computer undergraduate major in Guangxi Zhuang Autonomous Region. In 1985, it was renamed Computer and Application. In 1998, it was merged with Computer Software into Computer Science and Technology.

本专业 2010 年入选国家级特色专业，2011 年入选广西高等学校特色专业及课程一体化建设项目，2012 年入选教育部第二批卓越工程师教育培养计划实施专业，2013 年入选国家级本科专业综合改革试点，2018 年入选广西本科高校特色专业及实验实训教学基地（中心）建设项目。

The major was selected as one of the national level characteristic majors in 2010, as one of the construction project of integration of characteristic majors and curriculum in Guangxi higher education institutions in 2011, as the second batch of outstanding engineer education and training programs implemented by the Ministry of Education in 2012, as one of the pilot project of comprehensive reform of National Undergraduate majors in 2013, as one of the characteristic majors in Guangxi undergraduate colleges, and as one of the construction project of experimental and practical training teaching bases (centers) in 2018.

计算机科学与技术专业强调培养计算机工程领域的工程实践能力，加强硬件系统、软件系统综合设计能力训练。设置数字逻辑、计算机组成原理、微机原理与接口技术、单片机与嵌入式系统等主干课程，培养学生的硬件系统设计能力；设置算法语言、数据结构、数据库系统原理、编译原理、操作系统、软件工程等主干课程，培养学生的软件系统设计能力。以科研促教学，将实验、实践与学科竞赛紧密结合，注重学生逻辑思维、计算思维、系统思维、工程思维的递进培养，构建了“课内实验—独立设课实验—课程设计—实习实训—毕业设计—创新创业实践/科教协同”6 个层次的实践教学体系。开设系统的软/硬件课程和丰富的实践环节，促进本专业学生硬件、软件设计及综合应用能力培养，突出计算机系统构建能力的培养特色。

The Computer Science and Technology major emphasizes the training of engineering practical ability in computer engineering, and the training of comprehensive design ability of hardware and software systems. By setting up the main courses of digital logic, computer

composition principle, computer principle and interface technology, micro-controller and embedded system, the major trains the abilities of hardware system design. By setting up the main courses of algorithm language, data structure, database system principle, compiler principle, operating system, software engineering and so on, the major trains the students' software system design abilities. Meanwhile, the major promotes the teaching by scientific research, combining experiment, practice and subject competition closely, focusing on the progressive cultivation of the students' logical thinking, computational thinking, systematic thinking and engineering thinking. Six levels of practice are constructed as: in-class experiment -> independent course experiment -> curriculum design -> practice training -> Graduation Project -> innovation and entrepreneurship practice/science-education cooperation. Setting up systematic software/hardware courses and abundant practical links will promote the cultivation of the students' hardware, software design and comprehensive application abilities, and highlight the characteristics of the cultivation of computer system construction abilities.

三、毕业要求

Ⅲ. Graduation Requirements

毕业生应获得以下几方面的知识和能力：

Graduates should acquire the following knowledge and abilities:

1、工程知识：掌握计算系统相关的数学和自然科学知识，掌握计算机科学与技术基础和专业知识，并能用于解决复杂计算系统问题。

1.Engineering knowledge: Master the mathematics and natural science knowledge related to the computing system, master the basic and professional knowledge of computer science and technology, and can apply knowledge to solve the complicated computing system problems.

2、问题分析：掌握包括计算思维在内的科学思维方法，能结合数学、自然科学和计算机科学与技术的基本原理，识别和表达复杂计算系统设计、开发和应用中的问题，并通过文献研究等途径进行分析，获得有效结论。

2.Problem analysis: Master the scientific thinking methods including computational thinking, identify and express problems in the design, development and application of complex computational systems based on the basic principles of mathematics, natural science and computer science and technology, and obtain effective conclusions through the literature research.

3、设计/开发解决方案：能够提出复杂计算系统解决方案，设计并实现满足特定需求的计算机软/硬件功能模块与计算系统，并能够在设计中体现创新意识，考虑社会、健康、安全、法律、文化及环境等因素。

3.Design/development solutions: Propose the complex computing system solutions, computer software/hardware functional modules and computing systems that meet specific needs, and reflect the innovative consciousness in the design, taking into account social, health, safety, legal, cultural and environmental factors.

4、研究：能够基于计算机科学原理并采用专业科学方法对复杂计算系统问题进行研究，设计和开展实验，有效获取实验数据并进行分析综合，得到合理有效的结论。

4.Research: Based on the principles of computer science and the use of professional scientific methods to study complex computing system problems, design and carry out experiments, effectively obtain experimental data and analyze and synthesize, and get reasonable and effective conclusions.

5、使用现代工具：能够针对复杂计算系统的分析、设计和实现，开发、选择与使用恰当的技术、资源以及软/硬件开发工具，进行复杂计算系统的模拟、仿真与预测，并能理解工具的局限性。

5.Use modern tools: Analyze, design and implement complex computing systems. Develop, select and use appropriate technologies, resources and software/hardware development tools, simulate and predict complex computing systems, and understand the limitations of tools.

6、工程与社会：能够针对复杂计算系统解决方案和工程实践，综合考虑社会、健康、安全、法律以及文化等因素，理解应承担的责任。

6.Engineering and Society: Be able to understand the responsibilities of complex computing system solutions and engineering practices, and take into account social, health, safety, legal and cultural factors.

7、环境和可持续发展：理解环境保护和可持续发展理念，能够评价复杂计算系统工程实践对环境、社会可持续发展的影响。

7.Environment and Sustainable Development: Understand the concepts of environmental protection and sustainable development, and evaluate the impact of complex computing system engineering practice on environmental and social 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.Professional norms: With humanities and Social Sciences literacy and social responsibility, the graduates can understand and abide by engineering professional ethics and norms in engineering practice, and fulfill their responsibilities.

9、个人和团队：理解多学科背景下团队合作的重要性，具有协调、管理能力与合作精神，能够在多学科背景下的团队中承担个体、团队成员及负责人的角色。

9.Individuals and teams: Understand the importance of teamwork in a multidisciplinary context, have the ability to coordinate, manage and cooperate, and can play the roles of individuals, team members and leaders in a multidisciplinary team.

10、沟通：能够就复杂计算系统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档、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.Communications: The graduates have the ability to communicate and communicate effectively with peers in the industry and the public on complex computing system issues, including writing reports and design documents, presenting statements, clearly expressing or responding to instructions, with a certain international perspective, and are able to communicate and communicate in a cross-cultural context.

11、项目管理：理解并掌握复杂计算系统工程中涉及的管理原理与经济决策方法，并能在工程实践中应用。

11.Project management: The graduates should understand and master the management principles and economic decision-making methods involved in complex computing system engineering, and apply these knowledge in engineering practice.

12、终身学习：具有自主学习和终身学习的意识，能不断学习新知识、新方法和新技能，能适应社会和行业发展。

12.Lifelong learning: With the awareness of self-learning and lifelong learning, the graduates can constantly learn new knowledge, new methods and new skills, and can adapt to the development of society and industry.

四、课程计划与毕业要求的对应矩阵

Ⅳ. Correlation matrix of Curriculum Program and Graduation Requirements

毕业要求	指标点描述	课程
1.工程知识：掌握计算系统相关的数学和自然科学知识，掌握计算机科学与技术基础和专业知识，并能用于解决复杂计算系统问题。 1. Engineering knowledge: Master the mathematics and natural science knowledge related to the computing system, master the basic and professional knowledge of computer science and technology, and can apply knowledge to solve the complicated computing system	1-1 掌握计算机类专业必需的数学、自然科学基础知识，掌握计算机科学的基本思想和方法，并能应用于计算问题的表述。 1-1 Grasp the basic knowledge of mathematics and natural science necessary for computer major, grasp the basic ideas and methods of computer science, and further describe computational problems with those knowledge.	高等数学 A1-A2、线性代数 A、大学物理 B、计算机科学导论、程序设计与问题求解 Advanced Mathematics A1-A2,Linear Algebra A，College Physics B,Introduction to Computer Science,Programming and Problem Solving
	1-2 掌握电子电路和算法设计基础知识，能针对具体的对象建立数学模型并求解。 1-2 Master the basic knowledge of electronic circuit and algorithm design, and design mathematical models for specific objects.	线性代数、大学物理 B、电路与电子技术基础、数据结构与算法、数字逻辑 Linear Algebra A，College Physics B,Foundation of Circuits and Electronics Technology,Data Structure and Algorithm,Digital Logic,Java Programming
	1-3 掌握问题抽象的基本方法，熟悉常见的数学模型，能将相关知识和数学建模方法用于专业问题分析和推演。	高等数学 A1-A2、离散数学 1-2、概率论与数理统计、软件工程 Advanced Mathematics A1-A2,Discrete

problems.	1-3 Grasp the basic method of abstraction of problems, go through common mathematical models, and be able to apply relevant knowledge and mathematical modeling methods to the analysis and deduction of professional problems.	Mathematics 1-2, Probability Theory and Mathematical Statistics,Software Engineering
	1-4 能将相关知识应用于计算系统解决方案的对比分析中，并试图改进。 1-4 Can apply the learned knowledge to the comparisons between different solutions and gain improvements.	计算机网络(外文教材）、操作系统、编译原理、计算机组成原理、数据库系统原理 Computer Network (English Textbook), Operating System, Principle of Compiling, Principle of Computer Composition, Principle of Database System
2.问题分析：掌握包括计算思维在内的科学思维方法，能结合数学、自然科学和计算机科学与技术的基本原理，识别和表达复杂计算系统设计、开发和应用中的问题，并通过文献研究等途径进行分析，获得有效结论。 2. Problem analysis: Master the scientific thinking methods including computational thinking, identify and express problems in the design, development and application of complex computational systems based on the basic principles of mathematics, natural science and computer science and technology, and obtain effective conclusions through the literature research.	2-1 能运用数学、自然科学基本原理和问题分析和求解的计算思维方法识别和判断工程问题的关键环节。 2-1 Can identify and judge the key links of engineering problems by using the basic principles of mathematics and natural science and the computational thinking method of problem analysis and solution.	高等数学 A1-A2、大学物理 B、离散数学 1-2、程序设计与问题求解、电路与电子技术基础 Advanced Mathematics A1-A2,College Physics B,Discrete Mathematics 1-2, Programming and Problem Solving, Circuit and Electronic Technology Foundation
	2-2 能分析系统的影响因素，选用适当的模型对系统中的特定问题进行表示，并分析其正确性。 2-2 Can analyze the influencing factors of the system, select appropriate models to express the specific problems in the system, and analyze their correctness.	编译原理、数据结构与算法、数字逻辑、操作系统 Principle of Compiling, Data Structure and Algorithms, Digital Logic, Operating System
	2-3 能分析计算系统各组成部分的相互联系和制约关系，给出适当的解决途径。 2-3 Can analyze the interconnection and restriction of each component of the calculation system, and give appropriate solutions.	计算机组成原理、数据库系统原理、编译原理、毕业设计 Principle of Computer Composition, Database System Principle, Principle of Compiling, Graduation Project
	2-4 能通过文献等途径对计算系统设计、开发和应用中的问题进行分析，并获得有效结论。 2-4 Can analyze the problems in the design, development and application of computing system through literature and other ways, and obtain effective conclusions.	计算机体系结构、计算机网络(外文教材）、信息检索技术、毕业设计 Computer Architecture, Computer Network(English Textbook), Information Retrieval Technology, Graduation Project
3.设计/开发解决方案：能够提出复杂计算系统解决方案，设计并实现满足特定需求的计算机软/硬件功能模块与计算系统，并能够在设计中体现创新意识，考虑社会、健康、安全、法律、文化及环境等因素。 3. Design/development solutions: Propose the complex computing system solutions, computer software/hardware functional modules and computing systems that meet specific needs, and reflect the innovative consciousness in the	3-1 能针对复杂计算系统需求，明确任务，确定设计目标和总体方案。 3-1 Can define tasks and determine design objectives and overall plans to meet the needs of complex computing systems.	软件工程、数据库系统原理、操作系统、Android 应用开发、生产实习 Software Engineering, Principle of Database System, Operating System, Embedded System Principle and Application C,Android Application Development,Production Practice
	3-2 能针对特定需求进行系统设计和模块设计，并在设计中体现创新意识。 3-2 Can design required systems and modules in innovative ways.	计算机体系结构、计算机组成原理课程设计、操作系统课程设计、编译原理课程设计、软件工程课程设计 Computer Architecture, Course Project of (Computer Principle, Operating System, Principle of Compiling, Software Engineering)
	3-3 能基于设计结果实现满足特定需求的计算机软/硬件功能模块以及计算系统。 3-3 Can realize the software/hardware function modules and the computing system based on the design results to meet the specific needs of the	微机原理与接口技术、计算机组成原理、Android 应用开发、毕业设计 Microcomputer Principle and Interface Technology, Principle of Computer Composition, Android Application

design, taking into account social, health, safety, legal, cultural and environmental factors.	computer.	Development, Graduation Project
	3-4 能在设计中考虑社会、健康、安全、法律、文化以及环境等因素。 3-4 Can consider social, health, safety, legal, cultural and environmental factors in the design.	毕业设计、计算机系统综合设计、美育与艺术类通识课 Graduation Project, Comprehensive Design of Computer System, Innovation and Entrepreneurship(GEC)
4.研究：能够基于计算机科学原理并采用专业科学方法对复杂计算系统问题进行研究，设计和开展实验，有效获取实验数据并进行分析综合，得到合理有效的结论。 4. Research: Based on the principles of computer science and the use of professional scientific methods to study complex computing system problems, design and carry out experiments, effectively obtain experimental data and analyze and synthesize, and get reasonable and effective conclusions.	4-1 能基于计算机基本原理和专业相关知识，调研分析问题的解决方案和实验方法。 4-1 Based on the basic principles of computer and professional knowledge, research and analysis of problem solutions and experimental methods.	数据结构与算法、计算机网络（外文教材）、操作系统、计算机组成原理、面向对象程序设计 Data Structure and Algorithms, Computer Network(English Textbook), Operating System, Principle of Computer Composition, Object-Oriented Programming
	4-2 能根据实验目的、内容和要求设计实验方案,能选用适当的实验方法和手段开展实验，能正确记录和分析实验数据，能规范的表述实验结果。 4-2 The experimental scheme can be designed according to the experimental purpose, content and requirements, the appropriate experimental methods and means can be selected to carry out the experiment, the experimental data can be correctly recorded and analyzed, and the experimental results can be standardized.	微机原理与接口技术实验、程序设计与问题求解实验、数字逻辑实验、数据库系统原理实验 Microcomputer Principle and Interface Technology Experiments, Programming and Problem Solving Experiments, Digital Logic Experiments, and Principle Experiments of Database Systems
	4-3 能对复杂计算系统问题的实验结果进行解释和信息综合，得到有效结论。 4-3 Can explain and synthesize the experimental results of complex computing system problems, and get effective conclusions.	计算机组成原理课程设计、操作系统课程设计、编译原理课程设计、软件工程课程设计 Course Project of (Principle of Computer Composition ,Operating System,Principle of Compiling, Software Engineering)
5.使用现代工具：能够针对复杂计算系统的分析、设计和实现，开发、选择与使用恰当的技术、资源以及软/硬件开发工具，进行复杂计算系统的模拟、仿真与预测，并能理解工具的局限性。 5. Use modern tools: Analyze, design and implement complex computing systems. Develop, select and use appropriate technologies, resources and software/hardware development tools, simulate and predict complex computing systems, and understand the limitations of tools.	5-1 掌握常用开发环境和开发工具的性能、适用范围，并能在实践中正确应用。 5-1 Master the performance and application scope of common development environment and tools, and apply them correctly in practice.	程序设计与问题求解实验、Android 应用开发、面向对象程序设计、计算机系统综合设计 Programming and Problem Solving Experiments, Android Application Development, Object-Oriented Programming, Comprehensive Design of Computer System
	5-2 了解常用的分析、设计、编码、测试、建模工具等，能开发或选用工具对复杂工程问题进行预测、仿真和模拟。 5-2 Understand the commonly used analysis, design, coding, testing, modeling tools, can develop or select tools to predict, simulate and simulate complex engineering problems.	编译原理课程设计、微机原理与接口技术实验 Compiler Principle Course Project, Microcomputer Principle and Interface Technology Experiment
	5-3 能在使用工具开展复杂计算系统工程实践的过程中理解工具的局限性。 5-3 Understand the limitations of tools during the process of implementing complex computing system engineering practices with tools.	软件工程课程设计、计算机系统综合设计、毕业设计 Software Engineering Course Project,Comprehensive Design of Computer System,Graduation Project
6.工程与社会：能够针对复杂计算系统解决方案和工程实践，综合考虑社会、健康、安全、法律以及文化等因素，理解应承担的	6-1 具有社会、健康、安全、法律以及文化意识，能理解它们对复杂计算系统工程实践的制约关系。 6-1 Possess social, health, safety, legal and cultural awareness and understand their	生产实习、思想道德修养与法律基础、创新创业通识课 Production Practice, Ideological and Moral Cultivation and Legal Basis,Innovation and

责任。 6. Engineering and Society: Be able to understand the responsibilities of complex computing system solutions and engineering practices, and take into account social, health, safety, legal and cultural factors.	constraints on the practice of complex computing system engineering.	Entrepreneurship(GEC)
	6-2 能理解复杂计算系统工程实践和解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的社会责任。 6-2 Understand the social, health, safety, legal and cultural impacts of complex computing systems engineering practices and solutions, and understand the social responsibilities.	工程概论、形势与政策、创新创业通识课 Introduction to Engineering, Situation and Policy,Innovation and Entrepreneurship(GEC)
7.环境和可持续发展：理解环境保护和可持续发展理念，能够评价复杂计算系统工程实践对环境、社会可持续发展的影响。 7. Environment and Sustainable Development: Understand the concepts of environmental protection and sustainable development, and evaluate the impact of complex computing system engineering practice on environmental and social sustainable development.	7-1 理解环境保护和社会可持续发展的理念和内涵，在实践中有环境保护和可持续发展意识。 7-1 Understand the concept and connotation of environmental protection and social sustainable development, and have the consciousness of environmental protection and sustainable development in practice.	工程概论、形势与政策、创新创业通识课 Introduction to Engineering, Situation and Policy,Innovation and Entrepreneurship(GEC)
	7-2 能评价复杂计算系统工程实践对环境、社会可持续发展的影响，以及潜在的隐患和损害。 7-2 Can evaluate the impact of complex computing system engineering practice on the sustainable development of the environment and society, as well as potential hazards and damages.	软件工程、计算机组成原理课程设计、毕业设计 Software Engineering, Course Project of Principle of Computer Composition，Graduation Project
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. Professional norms: With humanities and Social Sciences literacy and social responsibility, the graduates can understand and abide by engineering professional ethics and norms in engineering practice, and fulfill their responsibilities.	8-1 了解国情，理解社会主义核心价值观，维护国家利益，具有社会责任感。 8-1 Understand the national conditions, understanding the socialist core values, safeguarding the interests of the country, with a sense of social responsibility.	毛泽东思想和中国特色社会主义理论体系概论、形势与政策、中国近代史纲要、军事理论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics,Situation and Policy,Outline of Modern Chinese History, Military Theory
	8-2 能够树立正确的世界观、人生观、价值观，并能在实践中自觉遵守。 8-2 Can establish correct world outlook, outlook on life and values, and abide by them consciously in practice.	军事技能、马克思主义概论、心里健康教育类通识课、生产实习 Military Training, Introduction to Marxism, Psychological Health Education(GEC), Production Practice
	8-3 理解行业职业性质和社会责任，能在工程实践中自觉遵守职业道德和规范，并履行责任。 8-3 Understand the professional nature and social responsibility of the industry and consciously abide by professional ethics and norms in engineering practice and fulfill their responsibilities.	职业生涯规划与就业创业指导、思想道德修养与法律基础、大学物理实验 Career Planning and Employment Entrepreneurship Guidance, Ideological and Moral Cultivation and Legal Basis, College Physics Experiment
9.个人和团队：理解多学科背景下团队合作的重要性，具有协调、管理能力与合作精神，能够在多学科背景下的团队中承担个体、团队成员及负责人的角色。 9. Individuals and teams: Understand the importance of teamwork in a multidisciplinary context,	9-1 具有自我控制能力及人际交往能力，能与团队成员进行有效沟通，能在团队中独立和合作开展工作。 9-1 With self-control and interpersonal skills, can communicate effectively with team members, and can work independently and cooperatively in the team.	新生入学教育、心理健康教育类通识课、生产实习 Entrance Education for Freshmen (Safety Education for College Students, Psychological and Behavioral Training for Freshmen, etc.), Psychological Health Education(GEC), Production Practice
	9-2 能与团队其他成员进行有效沟通并开展合作，独立完成团队分配的工作。 9-2 Effective communication and cooperation with other members of the team to independently	计算机组成原理课程设计、编译原理课程设计、操作系统课程设计、软件工程课程设计、数据结构与算法 Course Project of (Principle of Computer

have the ability to coordinate, manage and cooperate, and can play the roles of individuals, team members and leaders in a multidisciplinary team.	complete the task assigned by the team.	Composition, Operating System,Principle of Compiling, Software Engineering), Data Structure and Algorithm
	9-3 能倾听团队成员的意见，并组织、协调团队成员开展工作。 9-3 Can listen to the opinions of team members, and organize and coordinate the work of team members.	计算机系统综合设计、创新与创业类通识课 Comprehensive Design of Computer System, Innovation and Entrepreneurship（GEC）
10.沟通：能够就复杂计算系统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档、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. Communications: The graduates have the ability to communicate and communicate effectively with peers in the industry and the public on complex computing system issues, including writing reports and design documents, presenting statements, clearly expressing or responding to instructions, with a certain international perspective, and are able to communicate and communicate in a cross-cultural context.	10-1 能通过口头、文档等形式就专业问题与业界同行及社会公众进行清晰表达，正确地回应指令。 10-1 Can clearly express professional issues with colleagues in the industry and the public through oral and documentation, and correctly respond to instructions.	写作与沟通、计算机科学导论、毕业设计 Writing and Communication, Introduction to Computer Science, Graduation Project
	10-2 能使用外语进行交流，能理解和尊重不同文化的差异性和多样性。 10-2 Can communicate in a foreign language, understand and respect the differences and diversity of different cultures.	大学英语 1-4、美育与艺术类通识课 College English 1-4, Aesthetic Education and Art(GEC)
	10-3 了解专业领域的国际发展动态，能在跨文化背景下就专业问题进行基本沟通和交流。 10-3 Understand the international developments in the field of major will enable basic communication and exchanges on professional issues in a cross-cultural context.	写作与沟通、计算机网络(外文教材)、毕业设计 Writing and Communication, Computer Network(English Textbook), Graduation Project
11.项目管理：理解并掌握复杂计算系统工程中涉及的管理原理与经济决策方法，并能在工程实践中应用。 11. Project management: The graduates should understand and master the management principles and economic decision-making methods involved in complex computing system engineering, and apply these knowledge in engineering practice.	11-1 掌握计算系统相关项目的开发过程和管理方法。 11-1 Master the development process and management method of related projects of computing system.	软件工程、工程概论 Software Engineering, Introduction to Engineering
	11-2 能在复杂计算系统设计、开发等过程中考虑成本、质量、效率等目标。 11-2 Can consider the cost, quality, efficiency and other objectives in the design and development of complex computing systems.	计算机系统综合设计、经济与管理类通识课 Comprehensive Design of Computer System, Economics and Management（GEC)
12.终身学习：具有自主学习和终身学习的意识，能不断学习新知识、新方法和新技能，能适应社会和行业发展。 12. Lifelong learning: With the awareness of self-learning and lifelong learning, the graduates can	12-1 通过科学的职业规划和工程实践训练，培养学生自主学习和终身学习的意识。 12-1 Possess the awareness of self-learning and lifelong learning by scientific career planning and engineering practice training.	职业生涯规划与就业创业指导、计算机科学导论、写作与沟通 Career Planning and Employment Entrepreneurship Guidance,Introduction to Computer Science, Writing and Communication
	12-2 掌握自主学习的方法，了解拓展知识和能力的途径。能不断学习新方法和新技能，适应行业发展。	毕业设计、程序设计与问题求解、计算机科学导论实验 Graduation Project, Programming and

constantly learn new knowledge, new methods and new skills, and can adapt to the development of society and industry.	12-2 Master the method of self-regulated learning and understand the ways to expand knowledge and ability. Ability to constantly learn new methods and skills to adapt to the development of the industry.	Problem Solving, Introduction to Computer Science Experiments

五、主干学科、核心课程与主要实践性教学环节

Ⅴ. Main Disciplines, Core Courses and Major Practical Links

1. 主干学科：计算机科学与技术。

1. Main disciplines: computer science and technology.

2. 核心课程：计算机科学导论、程序设计与问题求解、数据结构与算法、离散数学、操作系统、数据库系统原理、计算机组成原理、计算机网络、编译原理、算法设计与分析、网络安全技术等。

2. Core Courses: Introduction to Computer Science, Programming and Problem Solving, Data Structures and Algorithms, Discrete Mathematics, Operating Systems, Principles of Database Systems, Computer Organization, Computer Networks, Principles of Compiling, Algorithm Design and Analysis, Network Security Technology.

3. 主要实践性教学环节：计算机科学导论实验、数字逻辑实验、程序设计与问题求解实验、数据库系统原理实验、Android 应用开发、操作系统课程设计、计算机原理课程设计、编译原理课程设计、计算机系统综合设计、生产实习、毕业设计等。

3. Main practical teaching links: experiment of Computer Science, experiment of Digital Logic, experiment of Programming and Problem Solving, experiment of Database, Android Application Development, course project of (Operating System, Computer Principle, Principles of Compiling, Software Engineering), Comprehensive Design of Computer System, Production Practice, Graduation Project, etc.

六、毕业合格标准

Ⅵ. Graduation Qualification Criteria

1.符合德育培养目标要求。

1.The graduates should meet the requirements of moral objectives.

2.学生最低毕业学分为 165 学分。

2.The minimum graduation credits for the graduates are 165 credits.

3.符合大学生体育合格标准。

3.The graduates should meet the qualified standard of college PE.

4.完成第二课堂 8 学分。

4.The graduates should complete at least 8 credits in the second class.

七、修业期限和授予学位

Ⅶ. Study Duration and Degree Conferring

1.学制 4 年，修业期限：3～6 年

1.Length of schooling:4 years,Study Duration:3-6 years

2.授予学位：工学学士

2.Degree Conferring: Bachelor of Engineering

八、 计算机科学与技术专业 教学进程计划表

（1）计算机科学与技术专业 教学进程计划表（必修部分）

课程类别	核心课程	课程名称	学分	总学时	学时分配		各学期学时分配								应修学分
					讲授	实践/实验	一	二	三	四	五	六	七	八	
通识必修课		思想道德修养与法律基础 Ideological & Moral Cultivation and Fundamental of	3	48	42	6	48								37
		马克思主义基本原理概论 Introduction to Fundamental of Marxism	3	48	42	6				48					
		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 the Theoretical System of Socialism with China ’s Characteristics	5	80	70	10			80						
		中国近现代史纲要 Outline of Modern Chinese History	3	48	42	6		48							
		形势与政策1-8 Current Affairs and Policies 1-8	2	64	56	8	8	8	8	8	8	8	8	8	
		大学英语1-4 College English 1-4	12	192	192		48	48	48	48					
		体育1-4 Physical Education 1-4	4	144	144		36	36	36	36					
		军事理论 Military Theory	2	36	36			36							
		职业生涯规划与就业创业指导1-2 Career Planning and Guidance to Employment & Start-up 1-2	1	38	38			18				20			
		写作与沟通 Writing and Communication	2	32	32						32				
通识必修课小计			37	730	694	36	140	194	172	140	40	28	8	8	37
学科基础课	★	计算机科学导论 Introduction to Computer Science	2.5	40	40		40								31.5
		工程概论 Introduction to Engineering	1	16	16			16							
		线性代数A Linear Algebra A	3	48	48		48								
	★	高等数学A1-A2 Advanced Mathematics A1-A2	11	176	176		88	88							
	★	程序设计与问题求解 Programming and Problem Solving	3.5	56	56			56							
		大学物理B College Physics B	4	64	64			64							
		概率论与数理统计 Probability Theory and Mathematical Statistics	3	48	48				48						
		电路与电子技术基础 Foundation of Circuits and Electronics Technology	3.5	56	56				56/						
学科基础课小计			31.5	504	504		176	224	104						31.5

专业基础必修课	★	离散数学1-2 Discrete Mathematics1-2	4.5	72	72			40	32						38.5
		数字逻辑 Digital Logic	3	48	48				/48						
	★	数据结构与算法 Data Structure and Algorithm	5	80	56	24			80						
		面向对象程序设计 Object-Oriented Programming	2	32	24	8				32					
	★	数据库系统原理 Principle of Database System	3	48	48					48					
		微机原理与接口技术 Microcomputer Principle and Interface Technology	2.5	40	40					40					
	★	计算机组成原理 Principle of Computer Organization	4	64	56	8				64					
	★	操作系统 Operating System	3.5	56	48	8					56				
	★	计算机网络（外文教材） Computer Network (English Textbooks)	4	64	48	16					64				
	★	编译原理 Principle of Compiling	3	48	48							48/			
		计算机体系结构 Computer Architecture	2	32	32							32			
		软件工程 Software Engineering	2	32	32							32			
	专业基础必修课小计		38.5	616	552	64		40	160	184	120	112			38.5
必修课合计			107	1850	1750	100	316	458	436	324	160	140	8	8	107

（2）计算机科学与技术专业 教学进程计划表（选修部分）

课程类别	核心课程	课程名称	学分	总学时	学时分配		各学期学时分配								应修学分
					讲授	实践/实验	一	二	三	四	五	六	七	八	
专业限选课	★	形式语言与自动机理论 Formal Languages and Automation Theory	2	32	32					32					7
	★	算法设计与分析 Design and Analysis of Algorithm	2.5	40	32	8				40					
		嵌入式系统原理及应用 Principle and Application of Embedded System	2	32	24	8					32				
	★	数学建模 Mathematical Modeling	2	32	32					32					
		数字图像处理 Digital Image Processing	3	48	40	8					48				
		网络安全技术 Network Security Technology	2.5	40	32	8						40			
		机器学习 Machine Learning	2.5	40	32	8						40			
		企业自设课程1 Enterprise-provided Course 1	2	32		32							32		
	专业限选课小计		18.5	296	224	72				104	80	80	32		7

专业任选课		Python 开发技术 Programming in Python	2	32	24	8				32					6
		前端开发技术 Front-End Development	2.5	40	32	8					40				
		大数据处理技术 Big Data Processing Technology	2.5	40	32	8						40			
		ACM算法设计与竞赛 ACM Algorithm Design and Contest	2	32	32						32				
		计算机图形学 Computer Graphics	2	32	32						32				
		云计算技术 Cloud Computing	2.5	40	32	8						40			
		单片机原理及应用 Principles and Applications of Single Chip Microcomputer	2	32	16	16						32			
		企业自设课程2 Enterprise-provided Course 2	2	32		32							32		
	专业任选课小计		17.5	280	200	80				32	104	112	32		6
通识选修课	全校通识选修课		通识教育选修课程分为自然科学与技术工程类、人文与社会科学、经济与管理类、美育与艺术类、心理健康教育类、创新与创业类等六大类课程。 全校所有学生均需修读通识教育选修课程8学分，其中创新与创业≥2门，心理健康教育类≥1门，美育与艺术类≥2门；理工类专业另外必修经济与管理类≥1 门；经管文法艺术类专业另外必修自然科学与技术工程类≥1门。（若选修与本专业重复或相近的课程不计入学分）												8

（3）计算机科学与技术专业 教学进程计划表（实践部分）

课程类别	核心课程	课程名称	学分	总学时	学时分配		各学期学时分配								应修学分
					讲授	实践/实验	一	二	三	四	五	六	七	八	
实践环节		新生入学教育（大学生安全教育、新生心理行为训练等） Entrance Education for Freshmen, including Safety Education for College Students, Training on Psychological Behavior for Freshmen, etc.	2	32		32	32								不计学分
		军事技能 Military Practice	2	2周		2周	2周								
	★	计算机科学导论实验 Introduction to Computer Science Experiment	1	16		16	16								37
		大学物理实验 College Physics Experiment	0.5	8		8		8							
	★	程序设计与问题求解实验 Experiment of Programming and Problem Solving	1	16		16		16							
		数字逻辑实验 Experiment of circuits and electronics technology	1	16		16			16						

实践环节	★	数据库系统原理实验 Experiments of Database System	1	16		16				16					37
		微机原理与接口技术实验 Experiments of Microcomputer Principle and Interface Technology	1	16		16				16					
		信息检索技术 Information Retrieval	0.5	8		8				8					
	★	计算机组成原理课程设计 Course Project of Computer Principle	2	2周		2周					2周				
	★	操作系统课程设计 Course Project of Operation System	2	2周		2周						2周			
	★	编译原理课程设计 Course Project of Compiling Principle	2	2周		2周						/2周			
	★	软件工程课程设计 Course Project of Software Engineering	2	2周		2周						/2周			
	★	Android应用开发 Android Application Development	2	32		32						32			
		生产实习 Production Practice	2	2周		2周						2周			
		计算机系统综合设计 Comprehensive Design of Computer System	3	3周		3周							3周		
	★	毕业设计 Graduation Design	16	16周		16周								16周	
	实践环节小计		41	656		656	80	24	16	40	32	160	48	256	37

主管校长：周娅　教务处长：朱志斌　学院院长：常亮　学院副院长：刘振丙　专业负责人：董荣胜

注：　*/：表示前半学期开，/*：表示后半学期开。★：表示核心课程；

（4）计算机科学与技术专业 教学计划进程表（创新创业教育）

层次	课程模块	课程要求
第一层次	创新创业思维训练	创新创业教育融入所有课程教学和各教学环节，使每一位学生受到创新创业思维训练。 Innovation and entrepreneurship education is integrated into all courses and teaching links, so that every student is trained in innovative and entrepreneurship thinking.
第二层次	创新创业基本素质课程	完成通识教育选修课程“创新与创业”模块至少2门课程；职业生涯规划与就业创业指导，计算机科学导论，写作与沟通等。 Complete the general education elective course "Innovation and Entrepreneurship" module at least 2 courses; Career Planning and Employment Entrepreneurship Guidance, Introduction to Computer Science, Writing and Communication, etc.
第三层次	创新创业基本技能课程	基础实践类（计算机科学导论实验、大学物理实验、程序设计与问题求解实验、数字逻辑实验）、数据库系统原理实验、微机原理与接口技术实验、信息检索技术、生产实习、毕业设计。 Basic practice classes (introduction experiment of computer science, university physics experiment, program design and problem solving experiment, digital logic experiment), experiment of database system principle, experiment of computer principle and interface technology, information retrieval technology, production practice, graduation design.
第四层次	创新创业课外实践	参加科教协同、学科竞赛、创业实践等活动，在第二课堂 “科学技术与创新创业”完成2个学分。 Participate in activities such as science and education collaboration, subject competition and entrepreneurship practice, and complete 2 credits in the second class of "Science and Technology and Innovation and Entrepreneurship".

九、计算机科学与技术 专业培养计划总学时、学分统计表

课程类别		学时数	学分数	比例
通识课	通识必修课、通识选修课	858	45	27.3%
基础课	学科基础课	504	31.5	19.1%
专业必修课	专业基础必修课	616	38.5	23.3%
专业选修课	专业限选课、专业任选课	208	13	7.9%
实践环节	独立授课实验	160	8	4.9%
	集中性实践环节（包括见习、实习、毕业设计、毕业论文、社会调查等）	496	29	17.6%
合计		2842	165	100.0%
理论教学	通识必修课、通识选修课、学科基础课、专业基础课、专业限选课和专业任选课理论教学	2086	122	73.9%
实验教学	课内实验，独立授课实验，集中性实践环节	756	43	26.1%
合计		2842	165	100.0%
以下工科专业填写				
数学与自然科学类课程学分(≥15%)		408	25.5	15.5%
工程基础类课程、专业基础类课程与专业类课程学分(≥30%)		920	57.5	34.9%
工程实践与毕业设计（论文）学分(≥20%)		656	37	22.4%
人文社会科学类通识教育课程学分(≥15%)		858	45	27.3%
合计		165		

十、计算机科学与技术专业 供辅修的核心课程

课程名称	学时分配			学分	学期
	总学时	讲授	实践/实验		
离散数学1-2 Discrete Mathematics 1-2	72	72		4.5	2-3
数据结构与算法 Data Structure & Algorithm	80	56	24	5	3
数据库系统原理A Principle of Database System	48	48		3	4
计算机组成原理A Computer Organization Principle	64	56	8	4	4
操作系统A Operating System	56	48	8	3.5	5
计算机网络A（外文教材） Computer Network	64	48	16	4	5
编译原理 Compiling Principle	48	48		3	6
合计	432	376	56	27	