

计算机科学与技术专业（创新实验班）简介

Introduction to Computer Science and Technology Specialty (Experimental and Innovative Class)

中文简介：

计算机科学与技术专业（创新实验班），学制 4 年，专业属性为非师范专业，2012 年依托计算机科学与技术专业（陕西省特色专业）学科优势组建，体现了陕西师范大学重点建设的、以突出创新实践为特色的创新教育与人才培养新形式。目前，计算机科学与技术专业（创新实验班）在职任课教师 18 人，其中教授 4 人，副教授 4 人，任课教师均具有博士学位或硕士学位，拥有本科计算机实验室陕西省实验教学示范中心，以及长期合作关系的省内外多个专业实习基地。

英文简介：

The Specialty of computer science and technology (Experimental and innovative class), which is 4 years full time undergraduate study, is specialized in non-teaching-training. It is relied on the specialty of science and technology (Shaanxi Province's Characteristic Discipline) to form from 2012. As one of the key construction of Shaanxi Normal University, it is a new form of cultivation and training in order to highlight innovative practice features. Currently, there are 18 faculty members, including 4 full professors and 4 associate professors. All faculty members hold Ph. D degree or master's degree. The undergraduate computer lab for practice is certificated as Shaanxi provincial experimental teaching demonstration centre. And there is also a plurality of specialty practice bases with long-term partnership inside and outside the province.

计算机科学与技术专业（创新实验班）

Computer Science and Technology Specialty (Experimental and Innovative Class)

一、培养目标

I. Educational Objectives

以培养创新、拔尖人才为目标。该专业培养德、智、体、美全面发展，具备高尚的道德品质、宽厚的知识基础、突出的能力潜质、优秀的综合素质和开阔的国际视野。培养掌握计算机科学与技术学科基本理论、基本知识和基本技能与方法，掌握科学研究工具与方法以及软件开发、网络建设、信息安全等方面的专门人才。毕业生可进入高层次院校继续专业研究深造，也能够从事科研、教育、企事业单位从事信息系统开发、网络技术研究和计算机信息安全等工作。

The main objective of Computer Science and Technology Specialty (Experimental and Innovative Class) is to cultivate Innovative and Entrepreneurial talents. This specialty aims to cultivate students to have a comprehensive moral, intellectual, physical and aesthetic development, as well as moral quality, knowledge construction, highlight of capacity potential, international vision. Its students should master basic theories of computer science, basic knowledge and basic skills, tools and methods of science research, as well as software developing, networking, information security, and other aspects of professional skills. Graduates can enter high-level institutions as postgraduate, as well as work in information system development, network technologies and computer information security.

二、培养要求

II. Educational Requirements

1. 热爱中国共产党，热爱社会主义祖国；掌握马列主义、毛泽东思想、邓小平理论和“三个代表”重要思想；坚持科学发展观，具有科学的世界观、正确的人生观和价值观以及高尚的道德品质。

2. 具有扎实的自然科学基础知识、人文社科知识，大学英语达到国家规定的四级水平。掌握计算机科学与技术基本理论、基本知识，了解计算机及网络技术领域的一些最新进展与发展动态，特别掌握网络技术的基本理论、基本知识，具有设计、开发、运行和管理计算机网络与信息系统的全面能力。

3. 具备获取知识的能力、分析问题和解决问题的能力，具备创新意识和创造能力以及与人合作共事的能力；具备科学、合理的知识、能力和素质结构，有鲜明的个性特征。

4. 具有健康的体魄和一定的军事基本知识、基本技能，达到国家规定的《大学生体育合格标准》和军事训练标准；养成终生锻炼身体的习惯。

5. 具有良好的人文素质与科学素质，具有健全的人格和良好的心理素质，具有较强的创新精神和实践能力，成为德、智、体、美等全面发展的高素质人才。

1. Undergraduates should be of high civil quality. With a deep love for Chinese Communist Party and the socialist motherland, they should steadily accept the basic values of the Chinese nation and learn to behave by the corresponding codes of conduct. Undergraduates should build up noble moral accomplishment. They should develop a correct outlook of life and gracious humanistic literacy by inheriting excellent Chinese culture and absorbing advanced values and scientific concepts abroad to cultivate wholesome personality and sound psychological quality.

2. Undergraduates should have a solid grounding in natural sciences, humanities and social sciences; be

proficient in university English of CET4. Undergraduates should have a master of basic principles and knowledge of computer science and technology, especially the development and trends in computer and network technology; have the ability to design, develop, operate and manage networks.

3. Undergraduates should have the ability to acquire knowledge, the ability to analyze and solve problems, and the ability with innovation and creativity to work with people, the scientific and reasonable structure of knowledge and a distinct personality.

4. Undergraduates should have a healthy physique, some basic military knowledge and skills; meet the national standards of physical education and military training; develop lifelong exercise habits.

5. Undergraduates should have good characters and scientific literacy, sound personality and good psychological quality, strong innovative spirit and practical abilities, and can become high-quality talent with an all-round development of moral, intellectual, physical, and aesthetic.

三、主干学科

III. Core Disciplines

计算机科学与技术

Computer Science and Technology

四、主干课程

IV. Main Courses

普通物理及实验、概率论与数理统计、C语言程序设计、面向对象程序设计、数据结构、软件工程、电路基础、计算机组成原理、操作系统、计算机网络、算法设计与分析、Internet 协议原理与设计、编译原理

General Physics and Experiment, Probability and Statistics, Programming in C, Object-oriented Programming, Data Structures, Software Engineering, Fundamentals of Electric Circuits, Principles of Computer Organization, Operating Systems, Computer Networks, Algorithm Design and Analysis, Principle and Design of Internet Protocols, Compiling Principles

五、学制及授予学位

V. Schooling System & Degree Granting

学制 4 年

Four years

理学学士

Bachelor of Science

六、学分要求

VI. Total Credits

149 学分

149 credits

七、课程设置及学分、学时比例

VII. Course Settings and Percentage of Credits/Hours

课程类别 Course Catalogue		学分及比例 Credits and Percentage			
		学分 Cre.	小计 Sub-Total	占总学分比例 Percentage in Total Credits	小计 Sub-Total
通识教育模块 Liberal Studies Courses	通识教育必修课 Liberal Studies Compulsory Courses	34	42	22.8%	28.2%
	通识教育选修课 Liberal Studies Elective Courses	8		5.4%	
学科基础模块 Disciplinary Foundation Courses	相关学科基础课 Related Disciplinary Foundation Courses	16	27	10.7%	18.1%
	本学科基础课 Disciplinary Foundation Courses	11		7.4%	
专业课程模块 Specialized Courses	专业核心课 Specialized Compulsory Courses	41	70	27.5%	47.0%
	专业方向课 Specialized Restrictive Elective Courses	23		15.4%	
	专业拓展课 Specialized Non-restrictive Elective Courses	6		4.0%	
实践教学模块 Practice Work	必修课 Compulsory Courses	10	10-11	6.7%	6.7%
	选修课 Elective Courses	0-1			
合计 Total		149		100%	
说明 Notes	<p>1. 专业必修课（包括学科基础课和专业核心课）共 20 门。 2. 专业选修课共 30 门，其中专业方向课 15 门，专业拓展课 15 门。本专业学生应从专业方向课中至少选修 23 学分，从专业拓展课中至少选修 6 学分。 3. 实验课程共 31 门，其中独立开设的实验课 2 门，含综合性、设计性实验的课程 20 门，占实验课程总数的 65 %。</p> <p>1. There are 20 Specialized Compulsory Courses (including Specialized Compulsory Courses and Disciplinary Foundation Courses). 2. There are 30 specialized elective courses, including 15 Specialized Restrictive Elective Courses and 15 Specialized Non-restrictive Elective Courses. Undergraduates of this specialty should obtain at least 23 credits by taking Specialized Restrictive Elective Courses and at least 6 credits by taking Specialized Non-restrictive Elective Courses. 3. There are 31 experimental courses, including 2 independent experimental courses, 20 theoretical and designable experimental courses which is 65% of the total experimental courses.</p>				

八、计算机科学与技术专业（创新实验班）本科教学计划表

VIII. Teaching Scheme for Computer Science and Technology Undergraduate Candidates (Experimental and Innovative Class)

(一) 通识教育模块 (42 学分)

(I) Liberal Studies Courses (42 credits)

1. 通识教育必修课 (34 学分)

1. Liberal Studies Compulsory Courses (34 credits)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
1711001	思想道德修养与法律基础 The Ideological and Moral Cultivation and Fundamentals of Law	1	3	36	18	3	考试 Exam.
1711002	中国近现代史纲要 Outline of Modern and Contemporary Chinese History	1	2	27	9	2	考试 Exam.
1711003	马克思主义基本原理概论 Principles of Marxism	3	3	36	18	2	考试 Exam.

1711004	毛泽东思想和中国特色社会主义理论体系概论 Mao Zedong Thoughts and Theory of the Socialism with Chinese Characteristics	4	6	72	36	4	考试 Exam.
1711005-1 711011	形势与政策 1-7 The Current Situation and Policy(1-7)	1-7	2				考查 Quiz
0211012	大学语文(理、艺、体) College Chinese (for Science, Art and P.E. Specialties)	2	2	36		2	考试 Exam.
0411046	大学外语(一) College English 1	1	3	36	36		考试 Exam.
0411047	大学外语(二) College English 2	2	3	36	36		考试 Exam.
0411048	大学外语(三) College English 3	3	3	36	36		考试 Exam.
0411049	大学外语(四) College English 4	4	2	36			考试 Exam.
0411050	外语综合应用能力培训 Integrated Skills of Foreign Languages	4	1		36		考试 Exam.
1011039	大学体育(一) Physical Education 1	1	1	36			考试 Exam.
1011040	大学体育(二) Physical Education 2	2	1	36			考试 Exam.
1011041	大学体育(三) Physical Education 3	3	1	36			考试 Exam.
1011042	大学体育(四) Physical Education 4	4	1	36			考试 Exam.

2. 通识教育选修课 (8 学分)

2. Liberal Studies Elective Courses (8 credits)

通识教育选修课共 8 学分, 详见《陕西师范大学通识教育选修课课程方案》。

Undergraduates will obtain 8 credits by taking liberal studies elective courses; *see Liberal Studies Elective Courses Scheme of Shaanxi Normal University.*

(二) 学科基础模块 (27 学分)

(II) Disciplinary Foundation Courses (27 credits)

1. 相关学科基础课 (16 学分)

1. Related Disciplinary Foundation Courses (16 credits)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
1221006	高等数学(一) Advanced Mathematics 1	1	4	72	0	4	考试 Exam.
1221009	线性代数 Linear Algebra	1	3	54	0	3	考试 Exam.
1221008	高等数学(二) Advanced Mathematics 2	2	3	54	0	3	考试 Exam.
1221011	离散数学 Discrete Mathematics	2	3	54	0	3	考试 Exam.
1221010	普通物理及实验 General Physics and Experiment	3	3	36	36	2	考试 Exam.

2. 本学科基础课 (11 学分)

2. Disciplinary Foundation Courses (11 credits)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
1222032	计算机学科导论 Introduction to Computer Science	1	1	18	16	4	考查 Quiz
1222999	C 语言程序设计 Programming in C	1	5	72	36	4	考试 Exam.
1222033	数据结构 Data Structures	3	5	72	36	4	考试 Exam.

(三) 专业课程模块 (70 学分)

(III) Specialized Courses (70 credits)

1. 专业核心课程 (41 学分)

1. Specialized Compulsory Courses (41 credits)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
1241405	面向对象程序设计 Object-oriented Programming	2	4	54	36	3	考试 Exam.
1241409	数据库原理 Principles of Database System	2	4	54	36	3	考试 Exam.
1241412	电路基础 Fundamentals of Electric Circuits	3	3.5	54	18	3	考试 Exam.
1241413	软件工程 Software Engineering	3	3	54	0	3	考试 Exam.
1241023	概率论与数理统计 Probability and Statistics	4	3	54	0	3	考试 Exam.
1241408	操作系统 (一) Operating Systems 1	4	3.5	54	18	3	考试 Exam.
1241414	计算机组成原理 Principles of Computer Organization	4	4.5	72	18	4	考试 Exam.
1241415	计算机网络 Computer Networks	4	4.5	72	18	4	考试 Exam.
1241416	算法设计与分析 Algorithm Design and Analysis	5	3	54	0	3	考试 Exam.
1241417	Internet 协议原理与设计 Principle and Design of Internet Protocols	5	3.5	54	18	3	考试 Exam.
1241002	研究方法 with 学术论文写作指导 Research Methods and Academic Writing	6	1	18	0	2	考查 Quiz
1241996	编译原理 Compiling Principles	6	3.5	54	18	3	考试 Exam.

2. 专业方向课程 (23 学分)

2. Specialized Elective Courses (23 credits)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
创新人才培养方向课程: Courses of Innovative Talents Cultivation Dimension							
1242424	电子技术基础 Fundamentals of Electronic Technology	3	2.5	36	18	2	考试 Exam.
1242426	汇编语言程序设计 Assembly Language Programming	4	3	36	36	2	考试 Exam.

1242431	高级英语 Advanced English	5	3	54	0	3	考查 Quiz
1242432	网络安全 Network Security	6	2.5	36	18	2	考查 Quiz
1242447	高等数学(综合提高) Advanced Mathematics (Comprehensive improvement)	6	3	54	0	3	考查 Quiz
创业人才培养方向课程: Courses of Entrepreneurial Talents Cultivation Dimension							
1242417	JAVA 语言程序设计 Programming in Java	3	3	36	36	2	考试 Exam.
1242427	可视化程序设计 Visual Programming	4	3	36	36	2	考查 Quiz
1242428	网络工程 Network Engineering	5	3	36	36	2	考查 Quiz
1242429	Web 信息系统设计与开发 Design and Development of Web Information Systems	5	3	36	36	2	考试 Exam.
1242405	嵌入式系统 Embedded System	6	3	36	36	2	考查 Exam.
各方向公选课程: Courses of All Cultivation Dimensions							
1242425	数字逻辑 Digital Logic	3	3.5	54	18	3	考试 Exam.
1242401	路由与交换技术 Routing and Switching	5	3	36	36	2	考查 Quiz
1242430	数据库应用 Database Applications	5	2	18	36	2	考查 Quiz
1242433	计算机通信原理 Computer Communication Principles	6	3	54	0	3	考试 Exam.
1242434	并行处理与分布式计算 Parallel and Distributed Computing	6	3	36	36	2	考查 Quiz

3. 专业拓展课程 (6 学分)

3. Specialized Non-restrictive Elective Courses (6 credits)

详见学院专业拓展课程。

See Specialized Non-restrictive Elective Courses of Computer Science School

(四) 实践教学模块 (10-11 学分)

(IV) Practice Work (10-11 credits)

1. 必修课 (10 学分)

1. Compulsory Courses (10 credits)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
2650101	军事理论与训练 Military Theory and Military Training	1	1				考查 Quiz
1250017	必读书目阅读 Required Readings		1				考查 Quiz
1250023	专业见习 Professional Visits	1-6	1				考查 Quiz

1250024	专业实习 Professional Practice	7	2				考查 Quiz
1250021	专业实践与社会调查 Professional Practice and Social Survey		1				考查 Quiz
1250022	科研训练 Scientific Research Training	3-6	1				考查 Quiz
1750013	大学生就业指导 College Students' Employment Guidance	6	1				考查 Quiz
1250025	毕业论文(设计) Graduation Thesis	7-8	2				考查 Quiz

2. 选修课 (1 学分)

2. Elective Courses (1 credit)

课程编码 Courses Code	课程名称 Courses Name	开课学期 Semester	学分 Cre.	讲授学时 Teaching Hrs.	实验/实践学时 Experiment/ Training Hrs.	周学时 Weekly Hrs.	考试方式 Evaluation
1750016	大学生职业生涯规划 Career Development and Planning	2	1				考查 Quiz

九、课程简介

IX. Brief Introduction of Main Courses

(一) 学科基础模块 (Disciplinary Foundation Courses)

1. 课程名称: 高等数学 (一) / (二)

(1) 课程编码: 1221006/1221008

(2) 课程简介: 该课程是计算机科学与技术各专业的一门重要基础课, 也是学习本专业后续课程的基础课之一。主要内容包括: 函数, 极限, 连续和导数; 求导法则; 导数和微分的应用; 一元函数的积分及应用; 积分方法; 常微分方程初步; 空间解析几何与向量代数; 无穷级数; 多元函数偏导数; 多重积分。

1. Course Name: Advanced Mathematics 1/2

(1) Course Code: 1221006/1221008

(2) Brief Introduction to the Course: It is a specialized foundation course for computer science and technology majors and is also one of the basic courses for learning follow-up courses of this specialty. The main content includes: function, limits, continuity and derivative, differentiation rules, applications of derivative and differential, integration of unary function and its applications, integration method, preliminary of ordinary differential equations; space analytic geometry and vector algebra; infinite series; partial derivatives and multiple integrals, partial derivative of multivariate function, multiple integration.

2. 课程名称: 线性代数

(1) 课程编码: 1221009

(2) 课程简介: 该课程是计算机科学与技术各专业的一门重要基础课。主要讲授行列式、矩阵、线性方程组、向量空间等重要概念, 注重对学生的分析能力和运算能力的培养与锻炼, 使学生以后能熟练使用线性代数的方法解决实际问题, 为以后的进一步学习打下良好的数学基础。

2. Course Name: Linear Algebra

(1) Course Code: 1221009

(2) Brief Introduction to the Course: It is a basic and important course for computer science and technology majors. The main teaching contents are about the important concepts such as determinants, matrices, linear equations and vector spaces. The course focuses on the training of analytical and operational capabilities of the students, and students are supposed to be able to solve practical problems using linear algebra methods and to lay a solid mathematical foundation for the further studies after completing the

course.

3. 课程名称：离散数学

(1) 课程编码：1221011

(2) 课程简介：该课程是计算机科学与技术各专业的一门必修课，也是专业基础理论的核心课程。本课程介绍各专业所需要的离散数学基础知识，为进一步学习计算机科学的基本理论和方法奠定基础。通过学习本课程，可以掌握数理逻辑、集合论、代数结构、组合数学和图论的基本概念和原理，并会运用离散数学的方法分析和解决计算机理论和应用中的一些问题。

3. Course Name: Discrete Mathematics

(1) Course Code: 1221011

(2) Brief Introduction to the Course: This is a compulsory course for students majoring in computer science and technology, and also one of the core disciplinary foundation courses. This course introduces the basics of discrete mathematics which are needed by all the specializations in computer science, and will lay the foundation for further study of basic theories and methods of computer science. Through this course, students will be able to master the basic concepts and principles of mathematical logic, set theory, algebraic structures, combinatorial mathematics and graph theory, and can use discrete mathematics' method to analyze and solve both the theoretical and practical problems.

4. 课程名称：普通物理及实验

(1) 课程编码：1221010

(2) 课程简介：该课程是计算机科学与技术专业的一门必修课。本课程介绍正确处理实验数据的方法和基本物理量的测量方法，进一步加强数字化测量技术和计算技术在物理实验教学中的应用。要求了解常用的物理实验方法，以及在近代科学研究和工程技术中的广泛应用的其他方法。掌握实验室常用仪器的性能，并能够正确使用。掌握常用的实验操作技术，通过示例介绍误差分配原则、配套仪器选定、最佳条件和最佳参数的确定等方法，使学生了解实验设计的基本程序和要求，掌握实验原理和方法的选择。

4. Course Name: General Physics and Experiments

(1) Course Code: 1221010

(2) Brief Introduction to the Course: This is a compulsory course for computer science and technology specialty. This course introduces how to correctly handle the experimental data and the measurement of basic physical quantities, and to further strengthening the applications of digital measurement technology and computing technology in physics experiment teaching. It requires students to understand the commonly used experimental methods in physics, as well as other methods which are widely used in modern science and engineering. Students should know the performance of commonly used laboratory instruments, be able to use them correctly, and master the commonly used experimental techniques. Through examples this course will introduce the error distribution principle, and the methods to determine the selection of ancillary equipments, the best conditions and the optimum parameters, etc. Therefore enable students to understand the basic procedures and requirements of the experiment design, master principles of experiments and to know how to select the methods.

5. 课程名称：计算机学科导论

(1) 课程编码：1222032

(2) 课程简介：该课程是针对计算机学科各专业学生的第一门与所学专业有关的入门概述性课程，内容覆盖了计算机学科的各主要领域，力求使学生对所学专业有初步的了解。内容包括：计算机的基本概念,计算学科的教育,对计算学科毕业生的基本要求,信息化社会的挑战,计算学科知识体系;计算机的运算基础,计算机的基本结构与工作原理,程序设计基础,算法基础,数据结构基础;计算机硬件系统;计算机系统软件与工具软件。

5. Course Name: Introduction to Computer Science

(1) Course Code: 1222032

(2) Brief Introduction to the Course: This is the first specialty-related and introductory course which designed for students majoring in all specializations of the computer science disciplinary. Its contents cover the main areas of computer science, and the course strives to make students obtain some understanding of their specialties. The main content includes: basic concepts of computer and computer science, education for computer science, the basic requirements for graduates in computer science, the challenges of the information society, knowledge system of computer science; the computing foundation of computer; the organization and principles of computer, programming, algorithms, data structures, hardware, system software and application software.

6. 课程名称：C 语言程序设计

(1) 课程编码：1222999

(2) 课程简介：要学好计算机科学与技术，就必须学习而且必须熟练掌握计算机程序设计语言。该课程的教学效果将直接关系到学生对后继课程的学习，程序设计的能力也将直接关系到培养出来的学生的软件开发能力。C 语言是现代最流行的程序设计语言之一，广泛用于系统软件设计和应用软件开发。本课程全面系统地介绍 C 语言的基本概念、语法规则及用 C 语言编制算法正确、结构良好的程序设计方法，使学生全面掌握 C 语言的功能，掌握结构化程序设计的理论和方法。

6. Course Name: Programming in C

(1) Course Code: 1222999

(2) Brief Introduction to the Course: To learn computer science and technology, students must learn and must be familiar with computer programming language. The effect of this course will directly affect the learning effect of the subsequent courses, and the students' programming ability will directly relate to their software development capabilities. The C language is one of the most popular modern programming languages and is widely used in system software design and application development. This course provides a comprehensive and systematic introduction to C's basic concepts, grammar rules and the methods of how to correctly implement algorithm and design well-structured program. This course enables students to fully grasp the function of C language and master the theories and methods of structured programming.

7. 课程名称：数据结构

(1) 课程编码：1222033

(2) 课程简介：该课程是计算机专业的一门核心专业基础课，它不仅是一般程序设计的基础，而且是设计和实现编译程序、操作系统、数据库系统及其它系统程序和大型应用程序的重要基础。它主要讲授线性结构、树形结构和图型结构几种基本的数据结构，在此结构上的查找表数据结构以及计算机程序设计中的重要运算，同时对文件结构和内存的动态管理技术也作了介绍。

7. Course Name: Data Structures

(1) Course Code: 1222033

(2) Brief Introduction of the Course: Data Structure plays an important role in cultivating the students' data abstraction ability, algorithm design ability and creative thinking. It requires the students to solve the practical application problems by selecting appropriate data structure and algorithm. The contents include basic data structures and their application, searching method and ordering method of linear list, stack, queue, string, array, generalized list, tree and graph, etc..

(二) 专业课程模块 (Specialized Courses)

1. 课程名称：面向对象程序设计

(1) 课程编码：1241405

(2) 课程简介：该课程借助 C++ 语言讲授面向对象程序设计的核心思想以及一些经典的设计模式，训练学生使用面向对象的思维、方法来解决问题，并能用 C++ 实现这些思路。通过学习、设计及实现，使学生掌握 OOP 方法、原则与理论，具有基本的 OOP 设计、开发能力，为后续课程及大型应

用软件的研究、设计打下基础。

1. Course Name: Object-oriented Programming

(1) Course Code: 1241405

(2) Brief Introduction to the Course: This course is taught by means of C++ to convey the core ideas of object-oriented programming language and some classic design patterns to students. It trains students to use object-oriented thinking and methods to solve the problems and to implement these ideas using C ++. Through the study, design and implementation, the course will enable students master the methods, principles and theories of OOP and have basic abilities for OOP design and development. This will lay the foundation for the subsequent courses and for the research and design of the large-scale application software.

2. 课程名称：数据库原理

(1) 课程编码：1241409

(2) 课程简介：该课程帮助学生掌握数据模型、数据库系统结构、关系数据理论、SQL 语言以及通用数据库应用等内容，能够独立地进行数据库的设计和开发。重点掌握数据库概念结构设计、数据库逻辑结构设计、数据库物理结构设计，掌握数据库应用程序设计、数据库索引，熟悉事务管理、数据库分析等。

2. Course Name: Principles of Database System

(1) Course Code: 1241409

(2) Brief Introduction to the Course: The course help students master data model, database system structure, relational data theory, SQL language and general database application etc., and can design and develop database independently. The focuses are on mastering the abilities of the conceptual model design of database, database logical model design, database physics model design, database application design, database indexing, and be familiar with the transaction management, database analysis, etc.

3.课程名称：电路基础

(1) 课程编码：1241412

(2) 课程简介：该课程介绍电路模型和电路定律；电阻电路的等效变换；电阻电路的一般分析；含有运算放大器的电阻电路；储能元件；一阶电路和二阶电路的时域分析；相量法；正弦稳态电路的分析；含有耦合电感的电路；电路的频率响应；三相电路；线性动态电路的复频域分析；电路方程的矩阵形式；端口网络；非线性电路。通过该课程的学习，学生能熟知电阻、独立电压源、独立电流源、受控电压源、受控电流源、电容、电感、耦合电感、理想运算放大器、理想变压器等元件的定义、性质及伏安关系，透彻理解基尔霍夫定律。

3. Course Name: Fundamentals of Electric Circuits

(1) Course Code: 1241412

(2) Brief Introduction to the Course: The course introduces models and circuit laws, the equivalent transforms of resistance circuit, the general analysis of resistance circuit, the resistance circuit with operational amplifiers, energy storage elements, the time-domain analysis of first-order circuits and second-order circuits, phase method, the analysis of sinusoidal steady-state circuits, coupling inductance circuits, the frequency response of circuits, terse-phase circuits, the complex frequency-domain analysis of linear dynamic circuits, the matrix form of circuit equations, port networks, nonlinear circuits. Through this course, students will be familiar with the definitions and properties of resistance, independent voltage source, independent current source, controlled voltage source, controlled current source, capacitors, inductors, coupled inductors, ideal operational amplifiers, transformers and the V-An relations, and they will also have a thorough understanding of Kirchhoff's law.

4.课程名称：软件工程

(1) 课程编码：1241413

(2) 课程简介：该课程是本专业学生的一门专业核心课程。它对于培养学生的软件素质，提高学生的软件开发能力和软件项目管理能力具有重要的意义。课程的主要内容有软件的基本概念和软件

工程的目标，通过对传统的软件开发方法和面向对象的软件开发方法的介绍，使学生掌握开发高质量软件的方法，通过对软件开发过程和过程管理技术的学习，使学生了解如何进行软件度量和管理，从而能够有效地策划和管理软件开发过程。

4. Course Name: Software Engineering

(1) Course Code: 1241413

(2) Brief Introduction of the Course: The course presents the basic issues on the engineering of software systems and software development project design. It presents concepts such as software life cycle, requirements and specifications, design principles, testing, formal analysis, and reviews, quality management and assessment, product and process metrics, COTS and reuse, evolution and maintenance, team organization and people management, waterfall model, rapid prototyping, iterative model, context diagram and data flow diagram, ER diagram, UML, unit test, integration test, CVS, CASE. It introduces software engineering approaches to the design and maintenance of software, the models of software development, the various design tools, the techniques of comprehensive testing, the tools for version control, documentation and CASE(computer aided software engineering), and software engineering aspects of programming languages.

5. 课程名称：概率论与数理统计

(1) 课程编码：1241023

(2) 课程简介：概率论是一门研究随机现象统计规律性数量关系的数学学科，而数理统计是研究如何有效地收集整理和分析受随机影响的数据，并做出统计推断、预测或者决策的一门学科，它以概率论为基础。该课程介绍概率论的数学理论，包括密度函数、分布函数、联合边缘分布、条件概率、期望与方差。然后介绍统计理论，包括参数估计、假设检验等。应使学生掌握概率论与数理统计的基本概念，了解它的基本理论和方法，从而使学生初步掌握处理随机现象的基本思想和方法，培养学生运用概率统计方法分析和解决实际问题的能力。

5. Course Name: Probability and Statistics

(1) Course Code: 1241023

(2) Brief Introduction to the Course: The probability theory is a mathematical discipline studying the relationship between statistical laws and the numbers of the random phenomena, and mathematical statistics is a discipline to study how to effectively collect, collate and analysis the data which influenced by random impacts, and make statistical inference, forecasting or decision. The mathematical statistics is based upon the probability. This course first introduces the mathematical principles of the probability, the contents including: density function, distribution function, joint marginal distributions, conditional probability, expectation and variance. And then the course introduces statistics theories including parameter estimation, hypothesis testing and so on. Students should master the basic concepts of probability theory and mathematical statistics, and understand the basic theories and methods so that they can grasp the basic ideas and methods of handling random phenomena. The course will also prepare students' ability to use probability and statistics to analyze and to solve practical problems.

6. 课程名称：操作系统（一）

(1) 课程编码：1241408

(2) 课程简介：该课程介绍操作系统的基本概念，重点从资源管理观点介绍操作系统的四大功能（处理机管理，存储器管理，文件管理，设备管理），及操作系统提供给用户的接口。此外还介绍了网络操作系统和分布式操作系统，并对流行的 UNIX 系统进行了分析。

6. Course Name: Operating Systems 1

(1) Course Code: 1241408

(2) Brief Introduction to the Course: The course introduces the basic concepts of the operating system, the four major functions (process management, memory management, file management, device management) mainly from the perspective of resource management, and the interfaces provided to users. It also introduces network operating systems and distributed operating systems, and analyzes the popular UNIX system.

7. 课程名称：计算机组成原理

(1) 课程编码：1241414

(2) 课程简介：该课程主要讲述计算机的基本组成和工作原理。理论教学主要从计算机系统概论、运算器和运算方法、存储系统、指令系统、中央处理器、总线系统、外围设备和输入输出系统这八个方面讲解计算机的基本组成、基本原理和基本的设计方法。

7. Course Name: Principles of Computer Organization

(1) Course Code: 1241414

(2) Brief Introduction of the Course: The course provides knowledge of the basic concept of computer organization and working principles. It includes: the basic concepts of computer system, arithmetic unit, memory system, instruction system, CPU, bus system, peripherals and I/O system.

8. 课程名称：计算机网络

(1) 课程编码：1241415

(2) 课程简介：该课程介绍现代计算机网络的概念和原理，重点强调协议、架构和实施方面的问题。内容涵盖物理层、数据链路层、信道共享技术、局域网、广域网、网络互连、运输层、计算机网络的安全、应用层协议和当前计算机网络的若干热门课题等。本课程的任务是：(1) 使学生对计算机网络从整体上有较清晰的了解；(2) 对当前计算机网络的主要种类和常用的网络协议有较清晰的概念；(3) 学会计算机网络操作、日常管理和维护的基本方法；(4) 初步掌握以 TCP/IP 协议族为主的网络协议结构；(5) 了解网络新技术的新发展。

8. Course Name: Computer Networks

(1) Course Code: 1241415

(2) Brief Introduction to the Course: The course introduces the underlying concepts and principles of modern computer networks, with emphasis on protocols, architectures, and implementation issues. The main contents include: physical layer, data link layer, channel sharing technology, LAN, WAN, network interconnection, transport layer, network security, application layer protocols and several hot topics of computer network. The tasks of this course are enable students to: (1) have a clear understanding about the overall of the computer networks; (2) have a clear concept about main types of the current computer networks and the popular network protocols; (3) learn operations, daily management and basic maintenance methods about the computer networks; (4) have a preliminary master about the network protocol structure based mainly on TCP / IP protocol suite; (5) know the development of new network technologies.

9. 课程名称：算法设计与分析

(1) 课程编码：1241416

(2) 课程简介：该课程系统地介绍了计算机算法的设计方法与分析技巧，通过课程学习，为独立地设计算法和对算法进行分析奠定坚实的知识基础，这对从事计算机软件和计算机应用的研究者来说是非常重要的和必不可少的。该课程的任务是：(1) 系统地学习和研究计算机领域常见而有代表性的算法；(2) 理解并掌握算法设计的主要方法；(3) 培养对算法复杂性进行分析的能力。

9. Course Name: Algorithm Design and Analysis

(1) Course Code: 1241416

(2) Brief Introduction of the Course: The course systematically introduces the design and analysis of algorithms. It covers the common algorithms such as greedy algorithm, divide-and-conquer, quick sort and merge sort, priority queues, balanced trees and tree searching, hashing, string searching, pattern matching, file compression, geometric search, spanning trees and shortest routes, algorithmic paradigms, and data structures used to solve these problems. The course emphasizes the relationship between algorithms and programming, and introduces basic performance measures and discusses various design techniques and topics of complexity.

10. 课程名称: Internet 协议原理与设计

(1) 课程编码: 1241417

(2) 课程简介: 该课程讨论 TCP / IP 的基本原理, 并深入分析各个协议的设计思想、工作流程及其所解决的问题。各个协议的应用及安全缺陷也体现于相应章节中, 以便学生对这些协议有更为深入的了解。此外, 该课程介绍协议的新发展。涉及的主要协议有点对点协议 PPP、互联网协议 IP、Internet 控制报文协议 ICMP、用户数据报协议 UDP、传输控制协议 TCP、选路信息协议 RIP、边界网关协议 BGP、网络管理标准 SNMP 等。

10. Course Name: Principle and Design of Internet Protocol

(1) Course Code: 1241417

(2) Brief Introduction to the Course: The course discusses some fundamental protocols of the TCP/IP protocol suite. It introduces the nuts and bolts of these protocols especially on their design thoughts, working process and the problems that they solved. The applications and security flaws of those protocols are provided to help students with understanding the protocol essence. In addition, some notable progresses about TCP/IP are also introduced. The main protocols involved in this course include the Point to Point Protocol (PPP), Internet Address (IP), the Internet Control Message Protocol (ICMP), the User Datagram Protocol (UDP), the Transmission Control Protocol (TCP), the Routing Information Protocol (RIP), the Border Gateway Protocol (BGP), the Simple Network Management Protocol (SNMP).

11. 课程名称: 研究方法 with 学术论文写作指导

(1) 课程编码: 1241002

(2) 课程简介: 科研方法的运用和学术论文的写作是大学生必须掌握的一项重要基本功。通过本课程, 学生可以了解本专业的科研与论文选题方法、科学研究方法、文献的检索与综述、学术论文的写作流程、写作方法与写作规范、学术论文的编排规范等环节并受到相应的训练。

11. Course Name: Research Methods and Academic Writing

(1) Course Code: 1241002

(2) Brief Introduction to the Course: The application of scientific research methods and academic writing is an important basic skill which students must master. Through this course, students will understand the scientific research and topic theses selecting methods of their specialties, research methods, literature search and review, writing processes of academic paper, writing methods and writing specifications, and editing specifications of academic papers, and get the appropriate training.

12. 课程名称: 编译原理

(1) 课程编码: 1241996

(2) 课程简介: 该课程主要介绍程序设计语言编译程序构造的一般原理、基本设计方法、主要实现技术方法。包括语言基础知识、词法分析程序设计原理和构造方法, 各种语法分析技术和中间代码生成、符号表的构造、代码优化、并行编译技术常识及运行时存储空间的组织等基本方法和主要实现技术, 并对 PL/0 编译程序进行分析。

12. Course Name: Compiling Principles

(1) Course Code: 1241996

(2) Brief Introduction to the Course: This course introduces the general principles, basic design methods and the main implementation technologies of the construction of the programming language compiler. The contents include the language basics, design principles of lexical analysis program and construction methods, a variety of parsing techniques, and the basic methods and the main implementation technologies of intermediate code generation, construction of the symbol table, code optimization, parallel compiler technology, runtime storage organization space etc., and the PL/0 compiler will also be analyzed.

13. 课程名称: 电子技术基础

(1) 课程编码: 1242424

(2) 课程简介: 该课程从宏观上可分为六大部分: 一、半导体器件基础; 二、电压放大与反馈

电路；三、功率放大电路；四、信号的运算与处理电路；五、信号发生电路；六、直流电源。其中五、六为选讲内容。通过学习本课程，一方面可为后续课程的学习打下良好的基础；另一方面可对常用的电子仪器、设备基本具备初步的读图分析能力、故障检修能力和初步的设计能力。

13. Course Name: Fundamentals of Electronic Technology

(1) Course Code: 1242424

(2) Brief Introduction to the Course: Generally, the course can be divided into six parts including basis of semiconductor devices, voltage amplification and feedback circuit, power amplification circuit, signal operation and processing circuits, signal generating circuits and the DC power supply. Through study, on the one hand students will lay a good foundation for subsequent course learning; on the other hand they will have the preliminary abilities in image analysis, troubleshooting and design with commonly used electronic equipments.

14. 课程名称：汇编语言程序设计

(1) 课程编码：1242426

(2) 课程简介：该课程主要介绍汇编语言程序设计方法和技术。主要内容包括：80X86 指令系统与寻址方式、汇编语言程序格式、基本程序结构与程序设计方法和技术、多模块连接技术、宏汇编、中断程序设计及 BIOS/DOS 系统功能调用，并介绍图形显示、发声和磁盘文件存取技术。

14. Course Name: Assembly Language Programming

(1) Course Code: 1242426

(2) Brief Introduction of the Course: The course mainly introduces the programming method and technology of 80X86 based assembly language including 80X86 based instruction system and addressing, program framework, basic program structures and their implementation, multi-module linkage, macro assembly, interrupt programming and BIOS/DOS system function call. In addition, the technologies of graph display, sound and disk file access are also included.

15. 课程名称：高级英语

(1) 课程编码：1242431

(2) 课程简介：该课程是一门提高学生的英语综合技能及熟练使用英语进行交际的能力的课程。通过阅读和分析内容广泛的材料，包括涉及政治、经济、社会、语言、文学、教育、哲学、宗教及自然科学方面的名家作品，扩大学生的知识面，加深学生对社会和人生的理解，培养学生对名篇的分析和理解能力、逻辑思维能力与独立思考的能力，增强对文化差异的敏感性，巩固和提高学生英语语言技能。

15. Course Name: Advanced English

(1) Course Code: 1242431

(2) Brief Introduction of the Course: The course improves students' English language skills and communication abilities. Through reading and analysis content of materials, including political, economic, society, language, literature, education, philosophy, religion and the masters' works, this course focuses on expanding students' knowledge, improving students' understanding of society and life, training students on the analysis and understanding capacity, enhancing on culture differences of sensitivity, consolidating and improving students' English language skills.

16. 课程名称：网络安全

(1) 课程编码：1242432

(2) 课程简介：该课程帮助学生对计算机系统与网络安全有一个全面的把握，并能深入理解和运用计算机系统与网络安全防御的技能，增强计算机系统与网络的安全防范能力。主要内容包括：密码学基础，网络基础（TCP/IP），恶意软件概念及防范，安全技术（防火墙，入侵检测，VPN 等），网络应用安全（网络扫描，网络监听，WEB 安全等），数据备份等。

16. Course Name: Network Security

(1) Course Code: 1242432

(2) Brief Introduction of the Course: The course provides a panoramic view of the grasp of computer systems and network security, in-depth understanding, application of computer systems, networks security and defense skills, to enhance security capabilities of computer systems and networks. The main contents include the basis of cryptography, networking fundamentals(TCP/IP), the concept of malicious software and prevention technology, security technology(Firewall, IDS, VPN etc.), network application security(network Scanning, Network Sniffer, Web security), data backups, etc..

17. 课程名称：高等数学（综合提高）

(1)课程编码：1242447

(2)课程简介：该课程在高等数学（一）和高等数学（二）的基础上，针对有进一步学术深造意愿的学生在函数、极限与连续，一元函数微分学，一元函数积分学，向量代数和空间解析几何，多元函数的微分学，多元函数的积分学和微分方程7个部分进一步提高和深化。

17. Course Name: Advanced Mathematics (Comprehensive Improvement)

(1) Course Code: 1242447

(2) Brief Introduction of the Course: On the basis of advanced mathematics-1 and-2, this course achieves improvement of such sections as function, limit and continuity, a unary function differential calculus, function of one variable integral calculus, vector algebra and spatial analytical geometry, differential calculus of function of many variables, function of several variables calculus and differential equations.

18. 课程名称：JAVA 语言程序设计

(1) 课程编码：1242417

(2) 课程简介：该课程介绍 Java 程序设计语言。主要包括语法规则，数据类型，Java 虚拟机，流控制，类和对象，继承和多态，抽象类和接口，异常，I/O 和其他知识。

18. Course Name: Programming in JAVA

(1) Course Code: 1242417

(2) Brief Introduction to the Course: This course provides an introduction to Java programming language. It mainly covers syntax rule, data type, Java virtual machine, flow control, class and object, inheritance and polymorphism, abstract class and interface, exception, I/O, and other knowledge in JAVA.

19. 课程名称：可视化程序设计

(1) 课程编码：1242427

(2) 课程简介：该课程结合 VB.NET 介绍 .NET 架构、编程基础、控制台应用程序设计、界面设计、数据库应用、GDI+绘图与多媒体应用、面向对象设计、报表设计、多项目开发、应用程序集成与部署安装、用户自定义控件、程序调试与异常处理技巧及窗口事件，并介绍若干工程实例应用以了解 VB.NET 使用技巧和项目开发经验。

19. Course Name: Visual Programming

(1) Course Code: 1242427

(2) Brief Introduction of the Course: Combining with Visual Basic .NET, the course introduces .NET framework, programming basis, console application design, interface design, database access, GDI+ drawing and multimedia application, object oriented design, crystal report, multi-project development, application deployment, user-defined control, windows events, debugging and exception process. Some project instances are introduced to help students understand and master project development.

20. 课程名称：网络工程

(1) 课程编码：1242428

(2) 课程简介：该课程是计算机网络的后续课程，包括多个不同难度的实验，适合学生循序渐进地学习。实验中的实验设计和安排以实验网络工程项目的需求为依据，涉及交换机、路由器、三层交换机、无线宽带路由器等网络设备的配置和管理；涉及常用网络服务的配置和管理。本课程旨在加

深学生对网络工程所涉及的理论知识的理解，提高学生网络工程相关的动手实践能力、分析问题和解决问题的能力。通过这些实验，学生能够掌握网络管理员和网络工程师所需要的基本实践技能。

20. Course Name: Network Engineering

(1) Course Code: 1242428

(2) Brief Introduction of the Course: The course provides several experiments of different levels to help students to implementing a computer network. The experiments involve the configuration and maintenance of switches, routers, wireless wideband routers, and the configuration and maintenance of common network services.

21. 课程名称: Web 信息系统设计与开发

(1) 课程编码: 1242429

(2) 课程简介: 该课程讲授 Web 服务技术, 涵盖 Web 服务的商业需求、技术原理、技术架构、技术开发以及应用模式, 主要包括如下内容: Web 服务概述、XML 与 XML Schema、SOAP、WSDL、UDDI、Web 服务组合、Web 服务应用开发、语义 Web 服务等。通过本课程的学习, 学生可以理解上述概念并掌握编写 Web 服务应用系统的能力。

21. Course Name: Web Information System Design and Development

(1) Course Code: 1242429

(2) Brief Introduction to the Course: The topic of this course is web services technologies, which involves business requirements, technical principles, technical architectures, development methods and application patterns. The contents of this course include but not limited to: an introduction of web services, XML and XML Schema, SOAP, WSDL, UDDI, web services composition, application development of web services, semantic web services, etc. Through study, students will understand these concepts and master the ability to develop application system of web service.

22. 课程名称: 嵌入式系统

(1) 课程编码: 1242405

(2) 课程简介: 该课程帮助学生掌握嵌入式系统设计和应用的基本方法。课程内容主要包括: 嵌入式系统的组成和基本原理、嵌入式微控制/微处理器及存储系统、总线、无线、能耗管理技术、嵌入式实时操作系统、嵌入式设计方法学、SoC 等等。学生通过本课程的理论学习和实践锻炼, 可以较好的培养嵌入式系统的开发能力。

22. Course Name: Embedded System

(1) Course Code: 1242405

(2) Brief Introduction of the Course: The course provides the methodology of embedded system design and application. The contents of this course include but not limited to: an overview of embedded system, embedded micro controllers and processors, embedded storage system, bus, wireless and power management technology, boot loader, real-time embedded OS, methods of embedded system design and development, the state-of-art SoC technology. Based on the study of embedded theory and the relative practice, students will have the special knowledge on embedded system, understanding the big picture of embedded system.

23. 课程名称: 数字逻辑

(1) 课程编码: 1242425

(2) 课程简介: 该课程是计算机组成原理、微机原理与接口技术等计算机硬件课程的基础课程, 理论和实践相结合。课程的理论教学主要有数制与编码、逻辑代数基础、同步时序逻辑电路、异步时序逻辑电路、中大规模集成电路的逻辑电路设计、数字系统设计、逻辑器件。

23. Course Name: Digital Logic

(1) Course Code: 1242425

(2) Brief Introduction of the Course: The course is the fundamental course for further studying the courses such as Principles of Computer Organization and Microcomputer and Interface Technology. It is an interdisciplinary course combining theory with practice. The main contents include number systems and

encoding, logic algebra, synchronous sequential logic circuit, asynchronous sequential logic circuit, logic circuit design of middle and large size integrated circuit, digital system design and logic instrument.

24. 课程名称：路由与交换技术

(1) 课程编码：1242401

(2) 课程简介：该课程的主要目标是让学生学习并掌握实用的计算机网络交换技术和路由技术。教学内容包含 7 个部分：网络技术基础知识、交换机基础、交换机实用配置、路由器基础、路由协议、路由器实用配置、三层交换实用配置。本课程编排了实验环节，用于帮助学生理解并强化所学知识和技能。

24. Course Name: Routing and Switching

(1) Course Code: 1242401

(2) Brief Introduction to the Course: The major objective of this course is to equip the students with the industrially useful capabilities and skills about switching and routing techniques used in real computer networks. The main content includes the fundamentals of the computer networks, switching basics, switch configuration, router basics, routing protocols, router configuration, multilayer switches. A special training course has also been developed to help students understand and strengthen what they have learned from the class.

25. 课程名称：数据库应用

(1) 课程编码：1242430

(2) 课程简介：依据一个具体的开发平台（Oracle 数据库），讲授数据库管理和前台应用开发技术，培养学生实际开发数据库应用的能力，逐步引导学生完成需求分析、概念设计、逻辑设计、物理设计、代码设计、试运行等任务。将软件工程、面向对象的开发方法贯穿整个教学及系统开发过程中。学生通过本课程的学习，能够熟练地掌握 Oracle 数据库的体系结构及对 Oracle 数据库的操作，并运用开发工具，采用面向对象方法，依据严格的代码规范和界面规范完成大作业，使学生初步达到能够设计一个合理的数据库，并开发一个基于 C/S 结构的数据库应用系统。

25. Course Name: Database Applications

(1) Course Code: 1242430

(2) Brief Introduction to the Course: Based on a specific development platform (Oracle database), the course introduces database management and foreground application development techniques. It aims to prepare students' database development and application skills, guide students to complete a variety of tasks including requirement analysis, conceptual design, logical design, physical design, code design and test run. The methods of software engineering and object-oriented programming will be used throughout the whole course process. Through study, students will understand the Oracle database architecture and master its operations, and be able to complete the assignment using development tools and OOP methods. The course will enable students to design an appropriate database, and to develop a database application system based on C/S structure.

26. 课程名称：计算机通信原理

(1) 课程编码：1242433

(2) 课程简介：该课程主要介绍计算机通信系统的基本原理和技术，主要内容包括：计算机通信系统的构成；计算机通信所涉及的基本理论；计算机通信标准接口；通信控制规程；通信系统的工作原理以及典型的计算机通信系统等。通过本课程学习，为学生从事计算机网络工程、计算机接口通信应用工程，打下一个良好的基础。

26. Course Name: Computer Communication Principles

(1) Course Code: 1242433

(2) Brief Introduction of the Course: This course mainly introduces the principles of computer communication system and its related technology. The main contents include the composition of computer communication system, the fundamental theory of computer communication, the standard interfaces for

computer communication, control procedures within communication, working principles of communication system and classic computer communication systems. Through studying this course, students could have a valid foundation to engage in projects of computer communication network and computer interfaces.

27. 课程名称：并行处理与分布式计算

(1) 课程编码：1242434

(2) 课程简介：该课程向学生介绍利用并行计算机和分布式环境实现并行编程的技术及应用。包括流水线、分治、同步、工作池等并行技术的基本概念，以及 MPI、PVM、OpenMP 等经典的并行编程模式。重点介绍分布式并行计算模型 Hadoop 系列技术。通过经典的排序、矩阵相乘、线性方程组求解、图像处理、搜索算法的并行实现的实例使学生掌握基本的并行程序设计方法。

27. Course Name: Parallel Processing and Distributed Computing

(1) Course Code: 1242434

(2) Brief Introduction of the Course: This course introduces how to master the technology and application of parallel programming by using parallel computers. This course includes not only the basic concepts of parallel technologies such as pipe-line, divide-and-conquer, synchronization, work pools, etc., but also some classic parallel programming patterns such as MPI(message passing interface), PVM(parallel virtual machine), and OpenMP. As the distributed parallel computing model, Hadoop is introduced emphatically. It aims to make students master the basic methods of parallel programming through classical sort, matrix multiplication, linear equations solution, image processing and search algorithms and other examples of parallel implement.

(三) 实践教学模块 (Practice Work)

1. 课程名称：专业见习

(1) 课程编码：1250023

(2) 课程简介：参观一个 IT 企业或一个事业单位，让学生了解未来的工作环境、工作单位的管理制度、工作流程和方法，体验岗位的知识、技能要求，增加对专业整体知识和职业技能的感性认识，增强学生的专业兴趣和自豪感，为后续相关专业课程的学习奠定基础。

1. Course Name: Professional Visits

(1) Course Code: 1250023

(2) Brief Introduction of the Course: Let students visit an IT enterprise or an institution to know the work environment, the management system, the work process and methods of enterprises and institutions, and the knowledge, skill requirements for posts. The course will cultivate their professional interests and prides, and lay a solid foundation the follow-up related courses.

2.课程名称：专业实习

(1) 课程编码：1250024

(2) 课程简介：专业实习是大学生经过三年的学习，在走向社会之前，锻炼综合运用所学的基础理论、基本技能和专业知识去独立分析和解决实际问题的能力，提前适应工作环境，掌握实际工作任务所需要的工作技能，从而弥补学校课堂教学的不足所必需的一个专业实践环节。这一环节是大学教育和实际工作岗位之间的一个桥梁。实习内容包括熟悉主要专业任务的分析、设计、开发与实现流程；了解相关行业的现状及其发展情况；了解企事业单位的业文化及其管理情况；学会怎样才能做一个合格的职业人。

2. Course Name: Professional Practice

(1) Course Code: 1250024

(2) Brief Introduction of the Course: Professional Practice will train students after three years of study in school and before playing professional roles. They will comprehensively apply the basic theory, basic skills and expertise to independently analyze and solve practical problems, adapt to the working environment in advance, grasp the practical working skills required for the actual job tasks, so as to make up for the lack

of classroom teaching. This is a necessary bridge between university education and practical work. The students will be familiar with the analysis, design, development and implementation process of professional tasks, understand current situation and development of relevant industries, understand the culture and management of the IT enterprises and institutions and learn how to be qualified professional personnel.

3.课程名称：专业实践与社会调查

(1) 课程编码：1250021

(2) 课程简介：专业实践与社会调查是培养、训练学生认识社会、观察社会以及提高分析问题、解决问题能力的实践教学环节，它不仅要求通过专业实践学生能够运用所学专业知识和技能解决问题，而且使学生通过社会调查来提高学生观察社会、认识社会的能力，提高学生的实践动手能力。

3. Course Name: Professional Practice and Social Survey

(1) Course Code: 1250021

(2) Brief Introduction of the Course: The course aims to train students to apply the professional knowledge and skills that they have grasped to solve problems through professional practice, and improve their ability to observe the society, understand society, and their practical abilities through social survey.

4.课程名称：科研训练

(1) 课程编码：1250022

(2) 课程简介：为了培养学生的创新意识和创业精神，本课程鼓励学生以科研小组为单位根据导师的科研领域、自己的专业兴趣和专业特长自主选择研究课题，确定研究目标、技术线路和研究计划开展研究。通过这个环节的锻炼，学生能进一步熟悉科学研究的一般过程与方法，培养探究问题的兴趣与能力，为将来从事相关研究工作或就业打下良好的基础。

4. Course Name: Scientific Research Training

(1) Course Code: 1250022

(2) Brief Introduction of the Course: In order to cultivate the students' sense of innovative consciousness and entrepreneurial spirit, this course encourages the students in the form of research group to choose the research problems according to their tutors' research fields, their professional interest and expertise. They will sketch their research objectives, methods and research plan, and carry out research. Through this course, students are supposed to be familiar with the basic scientific research process and methods, cultivate their research interest and probing ability, which will lay a solid foundation for their future research work or employment.

5.课程名称：毕业论文（设计）

(1) 课程编码：1250025

(2) 课程简介：毕业论文（设计）过程是培养学生综合素质和工程实践能力的重要实践教学环节。这将对学生专业能力的综合训练，对培养学生解决实际问题的能力、综合应用知识的能力、运用各种工具的能力、写作能力、表达交流能力、团队协作能力以及创新精神有很大的帮助。周期一般为半年，主要包括选题、开题、课题研究、论文写作和论文答辩等环节。

5. Course Name: Graduation Thesis

(1) Course Code: 1250025

(2) Brief Introduction of the Course: Graduation thesis writing is an important practical process of cultivating students' comprehensive quality and practical ability. This will greatly help to cultivate the students' ability to solve practical problems, the comprehensive ability of applying knowledge and various tools, writing ability, communication ability, team cooperation ability and spirit of innovation. For about half a year, the students need to carry out research problem choosing, opening report writing, researching, thesis writing and thesis defense.

计算机科学与技术专业（创新实验班）修读指南

Study Guidance to Computer Science and Technology Specialty (Experimental and Innovative Class)

一、指导性教学计划

第一学期			第二学期		
课程号	课程名称	学分	课程号	课程名称	学分
1711001	思想道德修养与法律基础	3	0211012	大学语文	2
1711002	中国近现代史纲要	2	0411047	大学外语（二）	3
0411046	大学外语（一）	3	1011040	大学体育（二）	1
1011039	大学体育（一）	1	1221008	高等数学（二）	3
1221006	高等数学（一）	4	1241409	数据库原理	4
1221009	线性代数	3	1241405	面向对象程序设计	4
1222032	计算机学科导论	1	1221011	离散数学	3
1222999	C 语言程序设计	5			
合计	必修 22 学分		合计	必修 20 学分	
（1）“形势与政策”为通识教育必修课，第 1-7 学期上课，共 2 学分。			（1）在第 2-6 学期中，须修读通识教育选修课 8 学分，每学期最多选修 2 门课程。		
第三学期			第四学期		
课程号	课程名称	学分	课程号	课程名称	学分
0411048	大学外语（三）	3	1711004	毛泽东思想和中国特色社会主义理论体系概论	6
1011041	大学体育（三）	1	0411049	大学外语（四）	2
1711003	马克思主义基本原理	3	0411050	外语综合应用能力培训	1
1221010	普通物理及实验	3	1011042	大学体育（四）	1
1222033	数据结构	5	1241023	概率论与数理统计	3
1241412	电路基础	3.5	1241408	操作系统（一）	3.5
1241413	软件工程	3	1241414	计算机组成原理	4.5
			1241415	计算机网络	4.5
专业方向课程			专业方向课程		
1242424	电子技术基础（方向 1*）	2.5	1242426	汇编语言程序设计（方向 1*）	3
1242417	Java 语言程序设计（方向 2*）	3	1242427	可视化程序设计（方向 2*）	3
1242425	数字逻辑（方向 1*、2*）	3.5			
合计	必修 21.5 学分，建议选修 2.5—9 学分		合计	必修 25.5 学分，建议选修 0—6 学分	
（1）在第 3-8 学期中，须修读专业方向课程 23 学分。 注：创新人才培养方向记为方向 1* 创业人才培养方向记为方向 2*			（1）本学期期间进行大学英语四级口语测试。		
第五学期			第六学期		
课程号	课程名称	学分	课程号	课程名称	学分

1241416	算法设计与分析	3	1241002	研究方法与学术论文写作指导	1
1241417	Internet 协议原理与设计	3.5	1241996	编译原理	3.5
专业方向课程			专业方向课程		
1242431	高级英语（方向 1*）	3	1242432	网络安全（方向 1*）	2.5
1242428	网络工程（方向 2*）	3	1242447	高等数学（综合提高） （方向 1*）	3
1242429	Web 信息系统设计与开发 （方向 2*）	3	1242405	嵌入式系统（方向 2*）	3
1242401	路由与交换技术 （方向 1*、方向 2*）	3	1242433	计算机通信原理 （方向 1*、方向 2*）	3
1242430	数据库应用（方向 1*、方向 2*）	2	1242434	并行处理与分布式计算 （方向 1*、方向 2*）	3
专业拓展课程			专业拓展课程		
1243001	专业英语（方向 1*）	2	1243424	数字图像处理技术（方向 1*）	1.5
1243422	计算机图形学（方向 1*）	1.5	1243433	操作系统（二）（方向 1*）	2
1243432	高级数据结构（方向 1*）	2	1243434	高级程序设计（方向 1*）	2
1243421	微机原理与接口技术（方向 2*）	2.5	1243423	移动计算（方向 2*）	1.5
			1243425	Android 应用开发（方向 2*）	1.5
合计	必修 6.5 学分，建议选修 10—15 学分		合计	必修 4.5 学分，建议选修 10—15 学分	
(1) 在第 5-8 学期中，须修读专业拓展课程 6 学分。 注：创新人才培养方向记为方向 1* 创业人才培养方向记为方向 2*			(1) 到本学期末应完成通识教育选修课 8 学分的修读，专业方向课程 23 学分的修读。		
第七学期			第八学期		
课程号	课程名称	学分	课程号	课程名称	学分
1250024	专业实习	2	1250025	毕业论文（设计）	2
专业拓展课程			专业拓展课程		
1243428	电子商务（方向 1*）	2	1243430	计算机新技术（方向 1*）	1
1243426	信息安全（方向 2*）	1.5	1243429	创新创业指导（方向 2*）	1
1243427	智能计算（方向 2*）	1.5	1243431	网路安全（方向 2*）	2.5
合计	必修 2 学分，建议选修 0—5 学分		合计	必修 2 学分，建议选修 0—4.5 学分	
(1) 专业实习为两个月。 注：创新人才培养方向记为方向 1* 创业人才培养方向记为方向 2*			(1) 完成毕业论文（学校会对毕业论文进行查重、盲审和答辩，一般安排在 5 月中下旬）。 (2) 到本学期末应完成专业拓展课程 6 学分的修读。 (3) 本学期止，总学分应不得少于 149 学分。 (4) 通常 6 月底办理离校手续。		

二、修读指导和说明

1. 学位授予

计算机科学与技术专业（创新实验班），非师范专业，学制四年，修业年限为 4-6 年，授理学学士学位。

2. 毕业要求

（1）学生毕业时由学校对其做全面鉴定。鉴定内容包括政治态度、思想意识、道德品质以及学习、劳动和健康状况等方面。

（2）学生在规定的修业年限内，修满教学计划要求的学分，且符合有关毕业的要求。

3. 学分要求

（1）学生按计算机科学与技术专业（创新实验班）本科教学计划表修读各门课程，总学分要求为 149 学分，其中通识教育模块不得低于 42 学分，学科基础模块不得低于 27 学分，专业课程模块不得低于 70 学分，实践教学模块不得低于 10 学分。

（2）专业课程模块中，专业核心课程应选满 41 学分，专业方向课程至少选修 23 学分，专业拓展课程（计算机科学学院专业拓展课程）至少选修 6 学分。

（3）专业方向课程（23 学分）中，选择创新人才培养方向学生的学分在该方向课程中至少选修 11 学分，其余学分可从其它方向课程或各方向共选课程中选修；选择创业人才培养方向学生的学分在该方向课程中至少选修 12 学分，其余学分可从其它方向课程或各方向共选课程中选修。

（4）专业拓展课程（6 学分）中，建议选择创新人才培养方向的学生，在专业英语、计算机图形学、高级数据结构、操作系统（二）、数字图像处理技术、高级程序设计、电子商务、计算机新技术课程中选修 6 学分，建议选择创业人才培养方向的学生，在微机原理与接口、移动计算、Android 应用开发、信息安全、智能计算、网络安全、创新创业指导课程中选修 6 学分。

4. 其它

课程开设时间、授课学时、课程开设方式及考核方式，参照陕西师范大学计算机科学学院计算机科学与技术专业（创新实验班）本科教学计划表执行。