

## 计算机科学与技术专业（师范）简介

### Introduction to Computer Science and Technology Specialty (Teaching-Training)

#### 中文简介：

计算机科学与技术专业（师范），学制4年，专业属性为师范专业。该专业始建于1985年，是我校优势特色专业之一，2008年获评陕西省特色专业，2015年入选陕西师范大学一流学科建设计划。目前，计算机科学与技术专业（师范）在职任课教师30人，其中教授5人，副教授18人，任课教师均具有博士学位或硕士学位，拥有用于教学实训的微格教学实验室、校园网络工程实验室、在建的教育机器人实验室、虚拟现实教学实验室等多个专业特色实验室，以及有长期合作关系的省内外多个教育实习基地。

#### 英文简介：

The Specialty of Computer Science and Technology, which is 4 years full time undergraduate study, is specialized in teaching-training. The Specialty was set up in 1985, and is one of the competitive and characteristic specializations of our university. In 2008, it was assessed as Shaanxi Province's Characteristic Discipline; in 2015, it was selected as the First-Class Disciplines Project of Shaanxi Normal University. Currently, there are 30 faculty members, including 5 full professors and 18 associate professors. All faculty members hold Ph. D degree or master's degree. The specialty has many teaching and training laboratories including microteaching laboratory and the campus network engineering laboratory. Some specialty-oriented characteristics laboratories such as education robot laboratory, virtual reality teaching laboratory, etc. are under construction. And there is also a plurality of educational practice bases with long-term partnership inside and outside the province.

# 计算机科学与技术专业（师范）

## Computer Science and Technology Specialty (Teaching-Training)

### 一、培养目标

#### I. Educational Objectives

以培养卓越教师为目标。该专业培养德、智、体、美全面发展，具有扎实系统的计算机科学和教育科学理论知识和技能、良好的教师素养和技能，兼具良好的数学、物理学等自然科学与人文社会科学综合素养，具有独立思考、工作、自主终身学习的能力，有创新精神、勇于探索并能运用专业知识解决实际问题，能够成为从事信息技术学科基础教育的卓越教师及其他信息技术行业的优秀工作者。

The main objective of Computer Science and Technology Specialty is to prepare graduated students to have the ability to become the outstanding teachers. The graduated students will be provided with the following qualities: have all around development of moral, intellectual, physical and aesthetic; have solid and systematic theoretical knowledge and skills in computer science and education science; possess the good qualities and skills for teaching; have comprehensive literacy in mathematics, physics and other natural sciences, humanities and social sciences; the ability to think and work independently and to perform lifelong self-learning; have strong innovative spirit, courage to explore, and be capable of applying professional knowledge to solve the problems in practice; can become outstanding teachers in elementary information technology education and can become the excellent practitioners in other IT industries.

### 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；具有良好的人文素养和教师职业素养，能为人师表。

2. 具有宽厚的相关学科基础知识、坚实的计算机科学理论基础和良好的实践能力；理解计算机工作原理，具有良好的软件能力、数据库能力、计算机网络能力、计算思维意识和信息技术教学能力；具有探索精神和一定的科研能力；大学英语达到国家规定的四级水平。

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. 热爱教育事业，熟悉教育法规，懂得教育基本理论和信息技术教学基本理论，掌握一定的现代教育技术，普通话水平达到二级乙等以上，具备教师的基本素质和基本技能，尤其是具备施行素质教育的意识和能力以及培育中学生创新意识和创造力的能力。

5. 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。

6. 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. They should also possess the good humanities and teacher professionalism, and can serve as a model of virtue for others.

2. Undergraduates should have broad and generous basic knowledge in specialty related disciplines, a solid foundation in basic theories of computer science and good practical abilities. They should also understand how computer works, have good capabilities in software, database, computer networks, have consciousness of computational thinking, and be capable of implementing information technology teaching; have the spirit of exploration and certain capacity of doing scientific research; be proficient in university English of CET4.

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

4. Undergraduates should have a keen interest in education, be familiar with the education laws and regulations, understand the basic theories of education and information technology teaching, master some modern educational technologies, and have a good command of Mandarin, the basic literacy and skills of teacher, especially the awareness of implementing quality education and the ability to foster middle school students' innovation consciousness and creativity.

5. 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.

6. 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

C 语言程序设计、面向对象程序设计、数据结构与算法、数据库原理、计算机组成原理、操作系统、计算机网络、编译原理、微机原理与接口技术、计算思维、校园网工程、教育机器人、教育学、教育统计方法与技术、信息技术与课程整合

Programming in C, Object-oriented Programming, Data Structures and Algorithms, Principles of Database System, Principles of Computer Organization, Operating Systems, Computer Networks, Compiling Principles, Microcomputer and Interface Technology, Computational Thinking, Campus Network Engineering, Education Robot, Education, Education statistics: Methods and Technologies, Information Technology and Curriculum Integration

## 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 Credit

152 学分

152 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 Credit	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	22.4%	27.6%
	通识教育选修课 Liberal Studies Elective Courses	8		5.3%	
学科基础模块 Disciplinary Foundation Courses	相关学科基础课 Related Disciplinary Foundation Courses	16	27	10.5%	17.8%
	本学科基础课 Disciplinary Foundation Courses	11		7.2%	
专业课程模块 Specialized Courses	专业必修课程 Specialized Compulsory Courses	36	51	23.7%	33.6%
	专业限定选修课程 Specialty-Oriented Elective Courses	11		7.2%	
	专业任意选修课程 Specialized Free Elective Courses	4		2.6%	
教师教育模块 Teacher-training Courses	公共核心课程 Core Common Courses	11	16-18	7.2%	10.5%
	学科核心课程 Core Disciplinary Courses	5		3.3%	
	拓展课程 Expanding Courses	0-2			
实践教学模块 Practice Work	必修课 Compulsory Courses	16	16-17	10.5%	10.5%
	选修课 Elective Courses	0-1			
合计 Total			152	100%	
说明 Notes	1. 专业必修课（包括学科基础课程和专业必修课程）共 19 门。 2. 专业选修课共 32 门，其中专业限定选修课程 17 门，专业任意选修课程 15 门。本专业学生应从专业限定选修课程中至少选修 11 学分，从专业任意选修课程中至少选修 4 学分。 3. 实验课程共 33 门，其中既有理论又有实验的课程 33 门，含综合性、设计性实验的课程 19 门，占实验课程总数的 58%。 1. There are 19 Specialized Compulsory Courses (including Specialized Compulsory Courses and Disciplinary Foundation Courses). 2. There are 32 specialized elective courses, including 17 Specialized Restrictive Elective Courses and 15 Specialized Non-restrictive Elective Courses. Undergraduates of this specialty should obtain at least 11 credits by taking Specialized Restrictive Elective Courses and at least 4 credits by taking Specialized Non-restrictive Elective Courses. 3. There are 33 experimental courses, including 19 theoretical and designable experimental courses which is 58% of the total experimental courses.				

## 八、计算机科学与技术专业本科教学计划表

### VIII. Teaching Scheme for Computer Science and Technology Undergraduate Candidates

#### (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- 1711011	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	4	考试 Exam.
0411047	大学外语 (二) College English 2	2	3	36	36	4	考试 Exam.
0411048	大学外语 (三) College English 3	3	3	36		2	考试 Exam.
0411049	大学外语 (四) College English 4	4	2	36		2	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 Experiments	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
1222031	数据结构与算法 Data Structures and Algorithms	3	5	72	36	4	考试 Exam

## （三）专业课程模块（51 学分）

### (III) Specialized Courses (51 credits)

#### 1. 专业必修课程（36 学分）

##### 1. Specialized Compulsory Courses (36 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	2	3.5	54	18	3	考试 Exam
1241404	数字逻辑 Digital Logic	3	3.5	54	18	3	考试 Exam
1241023	概率论与数理统计 Probability and Statistics	4	3	54	0	3	考试 Exam.
1241406	计算机组成原理 Principles of Computer Organization	4	3.5	54	18	3	考试 Exam
1241002	研究方法与学术论文写作指导 Research Methods and Academic Writing	5	1	18	0	2	考试 Exam
1241408	操作系统（一） Operating Systems 1	5	3.5	54	18	3	考试 Exam
1241411	计算思维 Computational Thinking	5	2	18	36	2	考试 Exam
1241415	计算机网络 Computer Networks	5	4.5	72	18	3	考试 Exam

1241996	编译原理 Compiling Principles	5	3.5	54	18	3	考试 Exam
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2. 专业限定选修课程 (11 学分)

2. Specialty-Oriented Elective 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
教师教育（卓越教师）方向课程： Courses of Teacher-Training (Outstanding Teachers) dimension:							
1242417	JAVA 语言程序设计 Programming in JAVA	3	3	36	36	2	考试 Exam
1242418	软件工程 Software Engineering	3	2	36	0	2	考查 Quiz
1242424	电子技术基础 Fundamentals of Electronic Technology	3	2.5	36	18	2	考试 Exam
1242409	多媒体教学设计艺术 The Art of Multimedia Teaching Design	4	1.5	18	18	2	考查 Quiz
1242410	教学动画设计 Animation Design for Teaching	4	2	18	36	2	考查 Quiz
1242430	数据库应用 Database Applications	4	2	18	36	2	考查 Quiz
1242414	Blackboard 平台应用 Blackboard Applications	5	2	18	36	2	考查 Quiz
1242429	Web 信息系统设计与开发 Web Information System Design and Development	5	3	36	36	2	考查 Quiz
1242451	微机原理与接口技术 Microcomputer and Interface Technology	5	3.5	54	18	3	考试 Exam
1242411	Office 可视化集成开发 Integrated Visual Development for Office	6	2	18	36	2	考查 Quiz
1242412	微课设计与实践 Microlecture Design and Practice	6	2	18	36	2	考查 Quiz
1242413	模拟课堂 Simulation of Classroom	6	2	36	0	2	考查 Quiz
1242415	教育统计方法与技术 Education statistics: Methods and Technologies	6	2	36	0	2	考查 Quiz
1242416	信息技术与课程整合 Information Technology and Curriculum Integration	6	2	36	0	2	考查 Quiz
1242419	教育信息系统设计与开发 Education Information System Design and Development	6	3	36	36	2	考查 Quiz
1242421	校园网工程 Campus Network Engineering	6	2	18	36	2	考查 Quiz
1242423	教育机器人 Education Robot	6	2	18	36	2	考查 Quiz

3. 专业任意选修课程 (4 学分)

3. Specialized Free Elective Courses of School of Computer Science (4 credits)

详见学院专业拓展课程。

See Specialized Non-restrictive Elective Courses of School of Computer Science for details.

(四) 教师教育模块 (16 学分)

(IV) Teacher-training Courses (16 credits)

1. 公共必修课程 (11 学分)

1. General Compulsory 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
1531101	心理学 Psychology		2	36		2	考试 Exam.
1531102	教育学 Education		2	36		2	考试 Exam.
1531103	教育心理学 Educational Psychology		2	18	18		考试 Exam.
1131104	现代教育技术 (网络教学) Contemporary Educational Technology (online course)	6	2				考试 Exam.
0831105	基础教育课程改革专题 Basic Education Curriculum Reform	4	1	18		1	考试 Exam.
1731106	教师职业道德 Teacher Professional Ethics	1	1	18	18		自学 为主 self-study
1731107	教育政策法规 Policies of Education	1	1	18	18		

2. 学科必修课程 (5 学分)

2. Disciplinary Compulsory Courses (5 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
1231108	信息技术学科教学论 Discipline Pedagogy	4	3	54		3	考试 Exam.
1231109	信息技术学科教材分析与教学设计 Disciplinary Textbook Analysis and Teaching Design	6	2	36		2	考试 Exam.

3. 选修课程 (见通识教育选修课程“教师教育”系列)

3. Elective Courses (See Teacher-training Series of Liberal Studies Elective Courses)

(五) 实践教学模块 (16-17 学分)

(V) Practice Work (16-17 credits)

1. 必修课 (16 学分)

1. Compulsory 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
2650101	军事理论与训练 Military Theory and Military Training	1	1				考查 Quiz
0250002	普通话水平培训与测试 Training and Test of Proficiency In Mandarin		1				考查 Quiz
3350001	粉笔字技能培训与测试 Training and Test of Proficiency Character (Written with Chalk)		1				考查 Quiz
3350002	钢笔字技能培训与测试 Training and Test of Proficiency Character (Written with Pen)		1				考查 Quiz
1250017	必读书籍阅读 Required Readings		1				考查 Quiz



1250018	学科教学技能训练 Pedagogical Training	6	1				考试 Exam.
1250019	教育见习 School Visits	1-6	1				考查 Quiz
1250020	教育实习 Teaching Practice	7	4				考查 Quiz
1250021	教育实践与社会调查 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 to 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;常微积分方程初步;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：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。

### **3. 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.

### **4. 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。

### **4. 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.

### **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。这一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: 数据结构与算法**

(1) 课程编码: 1222031

(2) 课程简介: 该课程在培养学生数据抽象能力、算法设计能力和创造性思维方面起着重要作用。它要求学生通过选择合适的数据结构和算法来解决实际应用问题。课程内容包含基本的数据结构及其应用,线性表、堆栈、队列、字符串、数组、通用链表、树和图等的查找和排序方法。课程还将系统地介绍算法设计与分析的内容,包括常见的算法如贪心算法、分治法、快速排序和归并排序、优先级队列,平衡树和树查找、哈希、字符串搜索、模式匹配、文件压缩、几何查找、生成树和最短路径、算法模式以及用于这些问题的数据结构。本课程强调算法和编程之间的联系,并将介绍基本的算法性能度量方法,讨论不同的算法设计技术和复杂性问题。

#### **7. Course Name: Data Structures and Algorithms**

(1) Course Code: 1222031

(2) Brief Introduction to 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 applications, searching methods and ordering methods of linear list, stack, queue, string, array, generalized list, tree and graph, etc. This course also 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 the computing complexity.

## **(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: This 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 Kirchoff's law.

### **4. 课程名称：数字逻辑**

(1) 课程编码：1241404

(2) 课程简介：该课程是计算机科学与技术专业本科学生的必修课程，是学习《计算机组成原理》、《微型计算机原理与接口技术》等计算机硬件课程的基础课程，属于理论和实践结合很强的一门课程。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。

### **4. Course Name: Digital Logic**

(1) Course Code: 1241404

(2) Brief Introduction to the Course: It is a compulsory course for computer science and technology majors, and the foundation course for further study of the computer hardware courses such as Principles of Computer Organization and Microcomputer and Interface Technology. It is a course which strongly combining theory and practice. The main contents of theoretical teaching include number systems and encoding, logic algebra basics, synchronous sequential logic circuit, asynchronous sequential logic circuit, logic circuit design of middle and large size integrated circuits, digital system design and logic instrument.

### **5. 课程名称：概率论与数理统计**

(1) 课程编码：1241023

(2) 课程简介：该课程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。本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：计算机组成原理**

(1) 课程编码：1241406

(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。

#### **6. Course Name: Principles of Computer Organization**

(1) Course Code: 1241406

(2) Brief Introduction to the Course: The goal of this course is to provide students with the knowledge about the basic concept of computer organization and the working principles. The theoretical teaching will introduce the basic components, principles and design methods of the computer mainly from the following eight aspects: the basic concepts of computer system, arithmetic unit and operation methods, storage system, instruction system, CPU, bus system, peripherals and I/O system.

#### **7. 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。

#### **7. 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.

#### **8. 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了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。

#### **8. 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.

#### **9. 课程名称：计算思维**

(1) 课程编码：1241411

(2) 课程简介：该课程运用计算机科学的基础概念进行问题求解、系统设计以及

人类行为理解的涵盖了计算机科学之广度的一系列思维活动。本课程介绍计算思维的基本概念和重要意义，学生通过案例分析、实验体会如何运用计算思维解决实际问题，尤其是信息技术教学中的问题。

#### **9. Course Name: Computational Thinking**

(1) Course Code: 1241411

(2) Brief Introduction to the Course: Computational thinking is taking an approach to solving problems, designing systems and understanding human behavior that draws on concepts fundamental to computing. This course will introduce the basic concepts and the significance of computational thinking. Through case studies and experiments, students will experience how to apply computational thinking to solve practical problems, especially those occur in information technology teaching.

#### **10. 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。

#### **10. 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.

#### **11. 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。

#### **11. 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.

## **12. 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。

### **12. 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.

## **13. 课程名称：软件工程**

(1) 课程编码：1242418

(2) 课程简介：该课程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。

### **13. Course Name: Software Engineering**

(1) Course Code: 1242418

(2) Brief Introduction to the Course: This course is of great significance for students' software quality, and will improve students' capabilities of software development and software project management. The main contents include the basic concepts of software and the goal of software engineering. Through the introduction to the traditional software development methods and object-oriented software development methods, students will master high-quality software development methods. By learning the software development process and process management technology, students will understand how to measure and manage the software, which can effectively plan and manage the software development process.

## **14. 课程名称：电子技术基础**

(1) 课程编码：1242424

(2) 课程简介：该课程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。

### **14. 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.

## **15. 课程名称：多媒体教学设计艺术**

(1) 课程编码：1242409

(2) 课程简介：该课程的主要目标是提高学生多媒体教学课件设计的能力，使得设计的课件简洁美观生动，富于表现力。课程内容包括美学基础、PPT 制作技能和美化工具软件的使用、多媒体内容的编排和组织风格等，还介绍包括手绘 PPT、虚拟现实教



学技术等内容呈现领域的最新发展。

### **15. Course Name: The Art of Multimedia Teaching Design**

(1) Course Code: 1242409

(2) Brief Introduction to the Course: The main objectives of the program are to improve the students' ability of multimedia courseware design and to making courseware to be simple, beautiful, vivid and expressive. The content includes foundations of aesthetics, PPT skills, utilization of the prettify software tools, the organization and layout style of the multimedia courseware, and it will also introduce some latest developments in the field of content presentation, such as hand-painted PPT, virtual reality teaching technologies, etc.

### **16. 课程名称：教学动画设计**

(1) 课程编码：1242410

(2) 课程简介：该课程介绍与教育教学相关的数字动画基础知识和基本技能。内容包括：动画基础、编剧与构想、运动规律、动画表演与动作间设计、数字摄像基础、角色造型设计、场景设计、多媒体制作、艺术评估及改进等。学生通过案例分析和实验实训掌握基本教学动画设计知识和技能。

### **16. Course Name: Animation Design for Teaching**

(1) Course Code: 1242410

(2) Brief Introduction to the Course: This course introduces the basic knowledge and skills of digital animation related to teaching and education. The contents include: basics of animation, script writing and ideas, the movement law, animation performance and motion design, the basics of digital camera pickup, character design, scenario design, multimedia production, artistic assessment and improvement. Students will master the basic knowledge and skills of teaching animation design through case studies and experimental training.

### **17. 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，逐步引导学生完成从需求分析、概念设计、逻辑设计、物理设计、代码设计到试运行等任务。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。

### **17. 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, logistical 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.

### **18. 课程名称：Blackboard 平台使用**

(1) 课程编码：1242414

(2) 课程简介：Blackboard 是一个由美国 Blackboard 公司开发数位教学平台，可有效提高学生的学习效果和教师的工作效率。本课程介绍该平台的使用方法，学生将掌握学习效果在线评测、在线交流教学辅助、远程在线教育、教学资源管理和统计等操作

技能，并能根据自身的特殊需求进行功能定制和扩展。

**18. Course Name: Blackboard Applications**

(1) Course Code: 1242414

(2) Brief Introduction to the Course: Blackboard is a digital teaching and learning platform developed by the American company Blackboard. Blackboard can effectively improve students' learning effect and teachers' productivity. This course introduces how to use the platform. The students will master the skills of online assessment of the learning effect, online teaching aids for exchange, remote online education, teaching resource management and statistics. And students can also learn how to customize and extend the functions according to their specific needs.

**19. 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。

**19. 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.

**20. 课程名称: 微机原理与接口**

(1) 课程编码: 1242451

(2) 课程简介: 该课程第一部分讲述微型计算机的实现技术。内容包括微型计算机原理、80X86 微处理器的结构、80X86 微处理器的指令系统、内存储器及其接口、输入输出、中断、可编程接口芯片及其应用、总线技术以及微机系统实用接口技术。课程第 2 部分简要介绍汇编语言程序设计的内容, 主要包括: 80X86 寻址方式、汇编语言程序框架、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等。

**20. Course Name: Microcomputer and Interface Technology**

(1) Course Code: 1242451

(2) Brief Introduction to the Course: The first part of the course is about the implementation technologies of microcomputer. It introduces basic concepts such as the principles of microcomputer, the organizations and instruction system of 80X86 microprocessors, memory and interfaces, input/output, interrupt, programmable interface chips and their applications, bussing technique and practical interface techniques of microcomputer systems. The second part provides a brief introduction to the assembly language programming. The main contents include: 80X86 addressing, the framework, basic program structures and their implementation, multi-module linkage, macro assembly, interrupt programming and BIOS/DOS system function call. And the technologies of graph display, sound and disk file access are also included.

**21. 课程名称: Office 可视化集成开发**

(1) 课程编码: 1242411

(2) 课程简介: 该课程结合 C#/VB 语言先介绍 .Net 架构, 包括编程基础、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及窗口事件等。在此基础上介绍 Word、Access、Excel 等微软 Office 软件的应用接口，通过 C#/VB 实现 Office 高级办公应用。

**21. Course Name: Integrated Visual Development for Office**

(1) Course Code: 1242411

(2) Brief Introduction to the Course: Combined with C#/Visual Basic, the course firstly introduces .NET framework, including programming basics, console application design, interface design, database access, GDI+ drawing and multimedia application, object oriented design, report design, multi-project development, application integration, deployment and installation, user-defined controls, debugging and exception handling and the windows events, etc. Then based upon above contents, the course will introduce the interfaces of the Microsoft Office including Word, Access and Excel etc., and use them to develop some advanced office applications.

**22. 课程名称：微课设计与实践**

(1) 课程编码：1242412

(2) 课程简介：微课以视频为主要载体，记录围绕某个知识点开展的教学活动。该课程介绍微课开发的流程，包括选题设计、课例拍摄、后期加工、在线报送、审核发布、评价反馈等环节，还介绍相关的开发工具使用。通过开发实践，学生将掌握如何将学科知识进行微课开发的基本技能。

**22. Course Name: Microlecture Design and Practice**

(1) Course Code: 1242412

(2) Brief Introduction to the Course: A microlecture is a short recorded audio or video presentation on a single, tightly defined topic. This course introduces the development processes of microlecture including the topic design, lesson shooting, post-processing, online reporting, examining and verifying, publication, evaluation and feedback etc. Some associated development tools will also be introduced. Through the development and practice, students will learn the basic skills of how to apply subject knowledge to develop microlecture.

**23. 课程名称：模拟课堂**

(1) 课程编码：1242413

(2) 课程简介：该课程旨在提高学生进行教学设计、课堂管理、课堂教学以及备课的能力。学生通过亲身教学实践以及观摩同学的课堂教学，提升从教技能。

**23. Course Name: Simulation of Classroom**

(1) Course Code: 1242413

(2) Brief Introduction to the Course: This course is designed to improve students' abilities of instructional design, classroom management, classroom teaching and lesson planning. Students will enhance their teaching skills through hands-on teaching practice and the observation of other students' classroom teaching.

**24. 课程名称：教育统计方法与技术**

(1) 课程编码：1242415

(2) 课程简介：该课程介绍教育统计学的基本原理、方法以及相关的应用案例。主要内容包括统计学的常用概念、统计资料的收集与整理、相对数与动态分析、正态分布及其应用、统计推断、方差分析、相关性分析、回归分析、聚类分析等，统计工具软件的使用，统计案例分析等。学生修完此课程后，应掌握利用统计学和信息技术对教育教学数据进行分析，进而发现问题和规律的能力。

**24. Course Name: Education Statistics: Methods and Technologies**

(1) Course Code: 1242415

(2) Brief Introduction to the Course: This course introduces the basic principles, methods

and related application cases for education statistics. The main contents include general concepts of statistics, collection and collation of statistical materials, the relative number and dynamic analysis, normal distribution and its applications, statistical inference, analysis of variance, correlation analysis, regression analysis, clustering analysis, the use of statistical tools and statistical case studies. After completing this course, students should be able to use the statistics and information technology to analyze data of education and teaching, and thus master the ability to identify the problems and laws.

#### **25. 课程名称：信息技术与课程整合**

(1) 课程编码：1242416

(2) 课程简介：信息技术与课程整合是当前我国教育改革的基点，信息技术的应用大大改变了教育活动中信息的呈现方式，使得我们有了把许多教学理念转化为实践的工具。通过对本课程的学习，使学生掌握信息技术与课程整合的背景与意义，信息技术与课程整合的基本理论，信息技术与课程整合的教学模式以及案例分析。为信息技术与课程整合实践提供一些思路。

#### **25. Course Name: Information Technology and Curriculum Integration**

(1) Course Code: 1242416

(2) Brief Introduction to the Course: Information technology and curriculum integration is the basing-point of the current Education Reform in China. Application of information technology has dramatically changed the way to present information in educational activities, and supply us the tool to convert teaching philosophy into practice. Through this course, students are supposed to master the background and significance, basic theories, teaching modes and analyzed cases of Information Technology and Curriculum Integration. It will provide some ideas for the practice of Information Technology and Curriculum Integration.

#### **26. 课程名称：教育信息系统设计与开发**

(1) 课程编码：1242419

(2) 课程简介：该课程是一门为了强化学生实践能力的课程。该课程要求学生通过设计实践将所学的数据库、程序开发语言、管理信息系统的有关知识和方法应用到系统开发中。具体地，要针对教育教学信息内容和功能要求进行系统分析与设计，通过实例开发，培养学生系统设计的整体思想与数据库结构设计能力，学习系统测试、编写技术文档的方法，培养独立学习、吸取他人经验、探究技术的习惯及团队合作精神，提高编程、调试的能力，使学生能综合应用前期所学知识。

#### **26. Course Name: Education Information System Design and Development**

(1) Course Code: 1242419

(2) Brief Introduction to the Course: This course aims to strengthen the students' practical abilities. The course requires students, through design and practice, to apply their learned knowledge and methods of database, programming language and management information systems to system development. Specifically, students should perform system analysis and design based on the educational and teaching contents and functional requirements. Through case development, it will train students' wholism and the capabilities of database structure design; make them learn the methods of system testing and technical document writing; cultivate their habits of independent studying, learning from others, exploring technology, and the spirit of team work; improve their capabilities of programming and debugging; and thus enable students to make comprehensive application of their early learned knowledge.

#### **27. 课程名称：校园网工程**

(1) 课程编码：1242421

(2) 课程简介：该课程是计算机网络的后续课程，包括了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。还将介绍如何设计、搭建、管理维护校园网。通过实验，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。

### **27. Course Name: Campus Network Engineering**

(1) Course Code: 1242421

(2) Brief Introduction to the Course: This is a follow-up course of the “Computer Networks”, which includes a number of experiments with different difficulties and suits for students to learn step-by-step. The design and arrangement of experiments are in accordance with the needs of network engineering project, which involves the configuration and maintenance of network devices, such as switches, routers, three-layer switches, wireless wideband routers, etc., and the configuration and management of network services are also involved. The course also introduces the design, construction, management and maintenance of the campus network. Through experiments, students will master the basic practical skills needed by network administrators and engineers.

### **28. 课程名称：教育机器人**

(1) 课程编码：1242423

(2) 课程简介：该课程融合计算机、机械设计、电子电路、传感器、人工智能等领域的先进技术。课程的基本内容包括机器人的语音控制、视觉导航、路径规划、竞赛以及一些教学辅助等实用功能的实现，要求学生将所学知识应用到机器人实践中，通过实训提高学生知行合一的能力。

### **28. Course Name: Education Robot**

(1) Course Code: 1242423

(2) Brief Introduction to the Course: Intelligent Robot integrates the advanced technologies of the fields of computer, mechanical design, electronic circuits, sensors, artificial intelligence and so on. The basic contents of this course include voice control, visual navigation, route planning, competitions and teaching aids, and as well as some other useful functions related to the robot. Through training, students will apply what they have learned into practice about robot, and improve their abilities for the unity of knowing and doing.

## **(三) 教师教育模块 (Teacher-training Courses)**

### **1. 课程名称：信息技术学科教学论**

(1) 课程编码：1231108

(2) 课程简介：该课程介绍了中学信息技术课程的教学目标和教学原则；学习理论和教学理论；教学过程、教学组织、教学方法。

### **1. Course Name: Discipline Pedagogy**

(1) Course Code: 1231108

(2) Brief Introduction to the Course: This course introduces the middle school IT curriculum's teaching objectives and principles, learning theory and teaching theory, teaching process, teaching organization and teaching methods.

### **2. 课程名称：信息技术学科教材分析与教学设计**

(1) 课程编码：1231109

(2) 课程简介：该课程对中学信息技术课程的各版教材进行了分析，并介绍了教学设计的原则和方法。

### **2. Course Name: Middle School Teaching Material Analysis and Teaching Design in IT Subjects**

(1) Course Code: 1231109

(2) Brief Introduction to the Course: The course analyzes several middle school textbooks for information technology course, and introduces the principles and methods of instructional design.

#### **(四) 实践教学模块 (Practice Work)**

##### **1. 课程名称: 学科教学技能训练**

(1) 课程编码: 1250018

(2) 课程简介: 该课程对师范生进行教师职业技能的培养。通过这门课程的训练, 要求他们在语言文字基本功(口语、书面语言的表达)、教学工作(教师备课、上课、批改作业和评定成绩)、班主任工作(班级管理、对学生进行思想品德教育和组织指导学生进行课外活动)等方面具备较高的技能。

##### **1. Course Name: Pedagogical Training**

(1) Course Code: 1250018

(2) Brief Introduction to the Course: This course cultivates students' professional skills for teaching. Through this course, the students will attain a high level in basic language skills (speaking and writing), teaching (lesson preparation, class teaching, homework correcting, and evaluating), and class adviser's work (class management, students' ideological and moral education, organization and guidance of extracurricular activities).

##### **2. 课程名称: 教育见习**

(1) 课程编码: 1250019

(2) 课程简介: 教育见习是让师范生走进一所学校, 了解一线教师备课、课堂教学、班主任工作等日常教育工作的流程, 体验岗位的知识、技能要求, 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。

##### **2. Course Name: School Visits**

(1) Course Code: 1250019

(2) Brief Introduction to the Course: School Visits let students visit a school and watch the daily education actions such as lesson preparation, classroom teaching, class adviser's work, experience the knowledge and skills requirements of the positions. The course will enhance their professional interests and prides, and lay a solid foundation for the follow-up related courses.

##### **3. 课程名称: 教育实习**

(1) 课程编码: 1250020

(2) 课程简介: 教育实习是师范生成为合格教师必不可少的实践环节。经过这个环节, 他们能在应聘教师之前, 能够综合运用所学的基础理论、专业知识和初步掌握的教师技能去完成各项基础教学任务, 提高自己的教师技能, 提前了解和适应工作环境, 为毕业从事基础教育工作打下良好的基础。实习内容包括课堂教学、班主任工作、信息技术课外活动、基础教育调查研究等。

##### **3. Course Name: Teaching Practice**

(1) Course Code: 1250020

(2) Brief Introduction to the Course: Teaching practice is essential for undergraduates to become qualified teachers. Through training, before applying the teacher position, students can use the basic theory, professional knowledge and preliminarily mastered teaching skills to complete the basic teaching tasks, improve their teaching skills, understand and adapt to the work environment in advance, and lay a solid foundation when engaged in basic education works after graduation. The practice contents include class teaching, class adviser's work, IT extracurricular activities, investigation of basic education, etc.

##### **4. 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。

#### **4. Course Name: Professional Practice and Social Survey**

(1) Course Code: 1250021

(2) Brief Introduction to the Course: Professional practice and social survey is one of the practice teaching parts which prepares and trains students to observe and understand the society, and so as to improve their abilities of analyzing and solving problems. It requires not only that those students can apply the knowledge and skills to solve problems through practice, but also to enable them to improve the abilities of social observation and cognition through social surveys, and to improve their practical abilities.

#### **5. 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。

#### **5. Course Name: Scientific Research Training**

(1) Course Code: 1250022

(2) Brief Introduction to the Course: In order to cultivate the students' innovative consciousness and entrepreneurial spirit, this course encourages the students, who taking a scientific research group as unit, choose research topics by themselves in accordance with tutor's research areas, their own special interests and expertise; identify research objectives, technical line and research programs and conduct research. Through this exercise, students will be familiar with the basic scientific research process and methods, and cultivate their research interest and issue probing ability, which will lay a solid foundation for their future research work or employment.

#### **6. 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、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。

#### **6. Course Name: Graduation Thesis**

(1) Course Code: 1250025

(2) Brief Introduction to the Course: Graduation thesis writing is an important practical process of cultivating students' comprehensive quality and practical ability. This will greatly help to prepare the students' abilities of solving practical problems, comprehensively applying knowledge and various tools, writing, expression and communication, team cooperation, and as well as the spirit of innovation. The period is usually of six months, and the contents include topic selection, opening, research, thesis writing and defense, etc.

# 计算机科学与技术专业（师范）修读指南

## Study Guidance to Computer Science and Technology Specialty (Teaching-Training)

### 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（理、艺、体）	2
1711002	中国近现代史纲要	2	0411047	大学外语（二）	3
1711005- 1711011	形势与政策 1-7	2	1011040	大学体育（二）	1
0411046	大学外语（一）	3	1221008	高等数学（二）	3
1011039	大学体育（一）	1	1221011	离散数学	3
1221006	高等数学（一）	4	1241405	面向对象程序设计	4
1221009	线性代数	3	1241409	数据库原理	4
1222032	计算机学科导论	1	1241412	电路基础	3.5
1222999	C 语言程序设计	5	1750016	大学生职业生涯规划	1
1731106	教师职业道德	1			
1731107	教育政策法规	1			
2650101	军事理论与训练	1			
1250019	教育见习	1			
1250017	必读书籍阅读	1			
合计	必修 29 学分		合计	必修 24.5 学分	
(1) “形势与政策 1-7” 为通识教育必修课，第 1-7 学期上课，共 2 学分。 (2) “教育见习” 在 1-6 学期进行，计 1 学分。 (3) “必读书籍阅读” 在 1-8 学期进行，应达到每学期要求阅读量，计 1 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 门此类课程。		
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
1711003	马克思主义基本原理概论	3	1711004	毛泽东思想和中国特色社会主义理论体系概论	6
0411048	大学外语（三）	3	0411049	大学外语（四）	2
1011041	大学体育（三）	1	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
1222031	数据结构与算法	5			
1241404	数字逻辑	3.5	1241023	概率论与数理统计	3
1531101	心理学	2	1241406	计算机组成原理	3.5
1250022	科研训练	1	1531102	教育学	2
0250002	普通话水平培训与测试	1	1231108	信息技术学科教学论	3
3350001	粉笔字技能培训与测试	1	1250021	教育实践与社会调查	1
3350002	钢笔字技能培训与测试	1			



专业限定选修课程			专业限定选修课程		
1242417	JAVA 语言程序设计	3	1242409	多媒体教学设计艺术	1.5
1242418	软件工程	2	1242410	教学动画设计	2
1242424	电子技术基础	2.5	1242430	数据库应用	2
合计	必修 24.5 学分, 选修 0-7.5 学分		合计	必修 22.5 学分, 选修 0-5.5 学分	
<p>(1) 在第 3-8 学期中, 专业限定选修课应至少选修 11 学分, 专业任意选修课至少选修 4 学分。</p> <p>(2) “科研训练”在第 3-6 学期进行, 计 1 学分。</p> <p>(3) “普通话水平培训与测试”、“粉笔字技能培训与测试”、“钢笔字技能培训与测试”在 3-7 学期进行, 各计 1 学分。</p> <p>(4) 本学期建议专业限定选修课至少选修 4 学分。</p>			<p>(1) 本学期间进行大学英语四级口语测试。</p> <p>(2) “教育实践与社会调查”在第 4-7 学期进行, 完成后经审查合格获得 1 学分。</p> <p>(3) 本学期建议专业限定选修课至少选修 3 学分。</p>		
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
1241002	研究方法与学术论文写作指导	1	1131104	现代教育技术(网络教学)	2
1241996	编译原理	3.5	1231109	信息技术学科教材分析与教学设计	2
1241408	操作系统(一)	3.5	1250018	学科教学技能训练	1
1241411	计算思维	2			
1241415	计算机网络	4.5			
1531103	教育心理学	2			
专业限定选修课程			专业限定选修课程		
1242414	Blackboard 平台应用	2	1242411	Office 可视化集成开发	2
1242429	Web 信息系统设计与开发	3	1242412	微课设计与实践	2
1242451	微机原理与接口技术	3.5	1242413	模拟课堂	2
			1242415	教育统计方法与技术	2
			1242416	信息技术与课程整合	2
			1242419	教育信息系统设计与开发	3
			1242421	校园网工程	2
			1242423	教育机器人	2
专业任意选修课程			专业任意选修课程		
1243001	专业英语	2	1243423	移动计算	1.5
1243421	微机原理与接口技术	2.5	1243424	数字图像处理技术	1.5
1243422	计算机图形学	1.5	1243425	Android 应用开发	1.5
1243432	高级数据结构	2	1243433	操作系统(二)	2
			1243434	高级程序设计	2
合计	必修 16.5 学分, 选修 0-16.5 学分		合计	必修 5 学分, 选修 0-25.5 学分	
<p>(1) 本学期建议专业限定选修课至少选修 2 学分, 建议专业任意选修课至少选修 2 学分。</p>			<p>(1) 到本学期末, 应完成通识教育选修课 8 学分的修读。</p> <p>(2) 到本学期末, 应完成专业限定选修课 11 学分的修读。</p>		

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
0831105	基础教育课程改革专题	1	1250025	毕业论文（设计）	2
1250025	毕业论文（设计）	0			
1250020	教育实习	4			
专业任意选修课程			专业任意选修课程		
1243426	信息安全	1.5	1243429	创新创业指导	1
1243427	智能计算	1.5	1243430	计算机新技术	1
1243428	电子商务	2	1243431	网络安全	2.5
合计	必修 5 学分，选修 0-5 学分		合计	必修 2 学分，选修 0-4.5 学分	
(1) 教育实习为完整一学期。 (2) 毕业设计从第 7 学期开始，至第 8 学期结束，计 2 学分。 (3) 到本学期末，应通过“普通话水平培训与测试”、“粉笔字技能培训与测试”、“钢笔字技能培训与测试”。 (4) 本学期建议专业任意选修课至少选修 2 学分。			(1) 完成毕业论文（学校会对毕业论文进行查重、盲审和答辩，一般安排在五月中下旬）。 (2) 到本学期末，应完成专业任意选修课程 4 学分的修读。 (3) 到本学期末，总学分应不得少于 152 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，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) 学生毕业时须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) 师范生粉笔字技能测试和钢笔字技能测试达到合格以上水平，普通话水平测试成绩达到二级乙等以上（少数民族学生达到三级甲等以上水平）。

### 3. 学分要求

(1) 学生按计算机科学与技术专业（师范）本科教学计划表修读各门课程，总学分要求为 152 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 51 学分，教师教育模块不得低于 16 学分，实践教学模块不得低于 16 学分。

(2) 专业课程模块中，专业必修课程应选满 36 学分，专业限定选修课程至少选修 11 学分，专业任意选修课程（计算机科学学院专业拓展课程）至少选修 4 学分。

(3) 专业任意选修课程（4 学分）中，建议师范专业学生在专业英语、微机原理与

接口、计算机图形学、移动计算、数字图像处理技术、Android 应用开发、信息安全、智能计算、电子商务、创新创业指导、计算机新技术、网络安全课程中选修 4 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（师范）本科教学计划表执行。