

## 软件工程专业简介

### Introduction to the Specialty of Software Engineering

#### 中文简介：

软件工程专业，学制4年，专业属性为非师范专业。该专业始建于2004年，是我校计算机科学学院独具特色的专业之一。该专业培养科学研究型人才，更注重培养符合“卓越计划”标准的具有竞争能力的多层次复合型软件实用人才。目前，软件工程专业在职任课教师18人，其中教授3人，副教授8人，任课教师均具有博士学位或硕士学位，拥有软件项目实训软件工程实验室，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 Software Engineering, which is 4 years full time undergraduate study, is specialized in non-teaching-training. This specialty was established in 2004, and is one of the specialty majors of our school of computer science. In addition to focusing on the professional training of scientific research personnel, we pay more attention to the cultivation of the multi-level composite software talents whose competitive ability meets the standard of the “excellence program”. Currently, there are 18 faculty members, including 3 professors and 8 associate professors. All faculty members hold Ph. D degree or master’s degree. The specialty has software engineering laboratories, and Shaanxi provincial experimental teaching demonstration centre for software project practice. And there is also a plurality of specialty practice bases with long-term partnership inside and outside the province.

# 软件工程专业

## Software Engineering Specialty

### 一、培养目标

#### I. Educational Objectives

以培养卓越工程师为主要目标。本专业培养德、智、体、美全面发展，具有扎实的软件基础并受到良好的软件工程训练，拥有良好的沟通技巧和团队工作能力的优秀工作者。依照软件产业需求来确定学生的培养方向，学生能够从事计算机软件教学、科学研究、软件开发与项目管理等工作。可在软件设计开发、软件工程、软件管理、数据库与信息系统、电子商务与电子政务等领域开展。培养符合“卓越计划”标准的高层次、国际化、工程型具有国际竞争能力的多层次复合型软件实用人才。

The main objective of the Software Engineering Specialty is to cultivate excellent engineers of Software engineering. This specialty aims to cultivate students to have a comprehensive moral, intellectual, physical and aesthetic development, own a solid foundation of software and good software engineering training, as well as have a competent communication skill and ability to work in the team. According to the need of the software industry, we determine the student training direction. The students of our specialty are able to work in computer software teaching, scientific research, software development and project management. The professional directions are mainly software design and development, software engineering, software management, database and information systems as well as e-commerce and e-government. In the light of the standard of “Excellence Program”, we cultivate the high level, international and engineering type of multi-level compound software practical talents with international competitiveness.

### 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. 掌握软件工程相关技术及理论知识，掌握计算机软件系统分析和设计的基本方法。具备初步从事大型软件系统开发、组织、管理的能力；具有认真细致的工作作风，勇于开拓、创新和良好的团队合作精神；了解计算机软件知识产权有关的法规；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. 具有健康的体魄，达到国家规定的大学生体育合格标准和军事训练标准，养成锻炼身体的习惯。具有健全的人格、良好的心理素质。

5. 具有良好的人文素质与科学素质、扎实的自然科学基础知识、人文社科知识，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 our 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 master of basic principles and knowledge of software engineering

and the basic methodology of software system analysis and design; have the ability to develop, organize, and manage large software engineering projects; have careful and meticulous work style, pioneering spirit, innovation and good team spirit; understand related regulations about software intellectual property; be proficient in university English of CET4.

3. Undergraduates should be equipped with the abilities such as knowledge acquisition, problem analysis and solving; Be provided with innovative consciousness, creative ability and cooperation ability; have a scientific and rational knowledge, ability and quality structure, as well as a distinct personality characteristics.

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

软件工程、计算机科学与技术

Software Engineering, Computer Science and Technology

### 四、主干课程

#### IV. Main Courses

面向对象程序设计、数据库原理、计算机组织与结构、软件工程、JAVA 语言程序设计、计算机网络、操作系统、软件体系结构、软件需求工程、Web 信息系统设计与开发、编译原理、可视化建模与 UML、CMMI 与 PSP、人机交互的软件工程方法

Object-oriented Programming, Principles of Database System, Computer Organization and Structures, Software Engineering, Programming in JAVA, Computer Networks, Operating Systems, Software Architecture, Software Requirements Engineering, Web Information System Design and Development, Compiling Principles, Visual Modeling and UML, CMMI and PSP, Software Engineering Method of Human-Computer Interaction

### 五、学制及授予学位

#### V. Schooling System & Degree Granting

学制 4 年

Four years

工学学士

Bachelor of Engineering

### 六、学分要求

#### VI. Total Credits

148 学分

148 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	23.0%	28.4%
	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	13	24	8.8%	16.2%
	本学科基础课 Disciplinary Foundation Courses	11		7.4%	
专业课程模块 Specialized Courses	专业核心课程 Specialized Compulsory Courses	48	72	32.4%	48.7%
	专业方向课程 Specialized Restrictive Elective Courses	18		12.2%	
	专业拓展课程 Specialized Non-restrictive Elective Courses	6		4.1%	
实践教学模块 Practice Work	必修课 Compulsory Courses	10-13	10-14	6.8%	6.8%
	选修课 Elective Courses	0-1			
合计 Total		148		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 21 门。                  2. 专业选修课共 29 门，其中专业方向课 14 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 18 学分，从专业拓展课中至少选修 6 学分。                  3. 实验课程共 40 门，其中独立开设的实验课 2 门，既有理论又有实验的课程 28 门，含综合性、设计性实验的课程 10 门，占实验课程总数的 25 %。</p> <p>1. There are 21 Specialized Compulsory Courses (including Specialized Compulsory Courses and Disciplinary Foundation Courses).                  2. There are 29 specialized elective courses, including 14 Specialized Restrictive Elective Courses and 15 Specialized Non-restrictive Elective Courses. Undergraduates of this specialty should obtain at least 18 credits by taking Specialized Restrictive Elective Courses and at least 6 credits by taking Specialized Non-restrictive Elective Courses.                  3. There are 40 experimental courses, including 2 independent experimental courses, 28 courses combined theory and experiment courses, and 10 theoretical and designable experimental courses which is 25% of the total experimental courses.</p>				

## 八、软件工程专业本科教学计划表

### VIII. Teaching Scheme for Software Engineering 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 Weekl y 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		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 (24 学分)

### ( II ) Disciplinary Foundation Courses(24 credits)

#### 1. 相关学科基础课 (13 学分)

### 1. Related Disciplinary Foundation Courses (13 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.

#### 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	3	5	72	36	4	考试 Exam.

### (三) 专业课程模块 (72 学分)

#### (III) Specialized Courses (72 credits)

##### 1. 专业核心课程 (48 学分)

##### 1. Specialized Compulsory Courses (48 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.
1241036	计算机组织与结构 Computer Organization and Structures	3	4.5	72	18	4	考试 Exam.
1241413	软件工程 Software Engineering	3	3	54	0	3	考试 Exam.
1241419	JAVA 语言程序设计 Programming in JAVA	3	3	36	36	2	考试 Exam.
1241415	计算机网络 Computer Networks	4	4.5	72	18	4	考试 Exam.
1241408	操作系统 (一) Operating Systems 1	4	3.5	54	18	3	考试 Exam.
1241030	软件体系结构 Software Architecture	4	3	54	0	3	考试 Exam.
1241202	软件需求工程 Software Requirements Engineering	5	4	54	36	3	考试 Exam.
1241418	软件过程与项目管理 Software Process and Project Management	5	3	36	36	2	考试 Exam.
1241420	Web 信息系统设计与开发 Web Information System Design and Development	5	3	36	36	2	考试 Exam.
1241004	研究方法与学术论文写作指导 Research Methods and Academic Writing	6	1	18	0	2	考查 Quiz
1241421	软件项目开发实训 Software Project Development Practice	6	4	54	36	4	考试 Exam.
1241996	编译原理 Compiling Principles	6	3.5	54	18	3	考试 Exam.

##### 2. 专业方向课程 (18 学分)

##### 2. Specialized Elective Courses (18 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
软件工程创新人才培养方向课程： Courses of Software Engineering Innovative Talents Dimension							
1242005	概率论与数理统计 Probability and Statistics	5	3	54	0	3	考试 Exam.
1242431	高级英语 Advanced English	5	3	54	0	3	考查 Quiz
1242447	高等数学（综合提高） Advanced Mathematics (Comprehensive improvement)	6	3	54	0	3	考查 Quiz
1242434	并行处理与分布式计算 Parallel Processing and Distributed Computing	6	3	36	36	2	考查 Quiz
卓越工程师培养方向课程： Courses of excellent engineers of Software engineering Dimension							
1242427	可视化程序设计 Visual Programming	5	3	36	36	2	考查 Quiz
1242428	网络工程 Network Engineering Practice	5	3	36	36	2	考查 Quiz
1242435	服务计算 Service Computing	5	3	36	36	3	考查 Quiz
1242440	商务智能 Business Intelligence	5	3	36	36	2	考查 Quiz
1242437	软件测试技术 Software Testing	6	3.5	54	18	3	考查 Quiz
1242438	CMMI 与 PSP CMMI and PSP	6	3	36	36	2	考试 Exam.
1242439	人机交互的软件工程方法 Software Engineering Method of Human-Computer Interaction	6	3	36	36	2	考查 Quiz
各方向共选课程： Courses of All Cultivation Dimensions							
1242430	数据库应用 Database Applications	3	2	18	36	2	考查 Quiz
1242436	可视化建模与UML Visual Modeling and UML	4	3.5	54	18	3	考查 Quiz
1242033	算法分析与设计 Algorithm Analysis and Design	5	3	54	0	3	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 School of Computer Science.

#### （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 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
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一门重要的基础课, 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 of the Course: It is one specialized foundation course for computer science and technology majors. The main content includes: function, limits, continuity and derivatives, differentiation rules, applications of differentiation, integrals, applications of integration, techniques of integration, ordinary differential equations, infinite series, the geometry of space and vector calculus, partial derivatives and multiple integrals.

##### 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一门重要的基础课。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 of the Course: It is one fundamental and important course for computer science and technology majors. It is a branch of mathematics about the study of vectors, matrices, determinants, vector spaces, systems of linear equations. Students are supposed to solve practical problems with the methods of linear algebra and lay a solid mathematical foundation for the further studies.

## **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 of the Course: It is one of the important basic courses for students majoring in Computer, Information and other relevant majors, playing a significant role in cultivating the students' logical thinking and ability of problem analyzing and solving. The content includes three parts: mathematical logic, set theory and graph theory, in which the mathematical logic can be divided into proposition logic and predicate logic, the set theory can be divided into set, relation and function, and the graph theory can be divided into the basic concept of graph and some special graphs(Euler graph, Hamilton graph, bipartite graph, plane graph and tree).

## **4. 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。

## **4. 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.

## **5. 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。课程的目标就是要培养学生熟练掌握一门目前最常用的计算机程序设计语言，为后继课程的学习以及为计算机的使用打下良好的基础。C 语言是现代最流行的程序设计语言系列之一，并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。

### **5. Course Name: Programming in C**

(1) Course Code: 1222999

(2) Brief Introduction of the Course: It is one of the compulsory foundation courses for the students majoring in Information and Computation. The course aims to help students master the thought of design procedures, apply C language to make programming, and improve their practical ability. Besides, it plays an important role in learning the follow-up related courses (such as Data Structure, C++). The content covers the basic theories of structured programming, basic grammar of C language, three basic structures (sequential, select and loop program design), array, function, pointer, structure and union as well as file.

### **6. 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; 和在此结构上的一种数据结构—查找表; 以及计算机程序设计中的一种重要运算; 同时对文件结构和内存的动态管理技术也作了介绍。

### **6. Course Name: Data Structures and Algorithm**

(1) Course Code: 1222031

(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, 帮助学生进行面向对象的思维、方法的训练, 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, 具有一定的 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 of the Course: The aim of this course is to provide a basic theoretical and classical implementation concept of OOP. It introduces C++ basics, classes, objects, class control constructs, inheritance, polymorphism and virtual functions.

### **2. 课程名称: 数据库原理**

(1) 课程编码: 1241409

(2) 课程简介: 该课程使学生掌握数据模型、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 of the Course: This course help students master data model, database system structure, relative data theory, SQL language and general database application etc., and to design and develop database independently, to fulfill database concept model design, database logical model design, database

physics model design, database application design.

### 3. 课程名称：计算机组织与结构

(1) 课程编码：1241036

(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。

### 3. Course Name: Computer Organization and Structures

(1) Course Code: 1241036

(2) Brief Introduction of the Course: The aim of this course is to provide 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.

### 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基础必修课程。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工作，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: This 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：JAVA 语言程序设计

(1) 课程编码：1242419

(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。

### 5. Course Name: Programming in JAVA

(1) Course Code: 1242419

(2) Brief Introduction of 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.

### 6. 课程名称：计算机网络

(1) 课程编码：1241415

(2) 课程简介：该课程全面系统地讲述计算机网络的发展和体系结构、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内容。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。

#### **6. Course Name: Computer Networks**

(1) Course Code: 1241415

(2) Brief Introduction of the Course: The course introduces the underlying concepts and principles of modern computer networks, with emphasis on protocols, architectures, and implementation issues. Students are supposed first to learn how to implement network applications (e.g., e-mail, FTP) using the existing TCP/IP network protocols and architectures, and then to study how/why these protocols and architectures work by using the layered organization of the Internet in a top-down fashion: the application, transport, network, data link and physical layers.

#### **7. 课程名称：操作系统（一）**

(1) 课程编码：1241408

(2) 课程简介：该课程介绍了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。

#### **7. Course Name: Operating Systems 1**

(1) Course Code: 1241408

(2) Brief Introduction of the Course: The course provides an in-depth understanding of roles of operating system in modern computer system, interfaces of operating system to different hardware and application program, algorithms that can be applied in operating systems, reasons behind the design of different operating systems. It introduces the basic concepts of OS such as: multiprogramming, multitasking, time-sharing, hardware interrupt, system call, process state, process control block, CPU scheduling, paging, virtual memory, page replacement algorithm, file and directory, open-file table, file allocation method, critical section, deadlock.

#### **8. 课程名称：软件体系结构**

(1) 课程编码：1241030

(2) 课程简介：软件体系结构指的是一个软件的结构，包括它的所有构件、它们的外部特征及其它它们之间的关系。该课程将介绍软件体系结构的概念、原理和最先进的方法，包括 DSSA、结构风格、ADL、软件连接件、基于体系结构的测试和分析。本课程将关注体系结构研究的实用性，特别是它与软件重用和构件互操作平台（如 CORBA、JavaBeans、COM/DCOM）。

#### **8. Course Name: Software Architecture**

(1) Course Code: 1241030

(2) Brief Introduction of the Course: The software architecture of a program is the structure or structures of the program, which comprises software components, the externally visible properties of those components, and the relationships between them. This course exposes students to the concepts, principles, and state-of-the-art methods in software architectures, which include domain-specific software architectures (DSSA), architectural styles, architecture description languages (ADL), software connectors, and architecture-based testing and analysis. The course specifies its relationship to the work in software reuse and component interoperability platforms (such as CORBA, JavaBeans, and COM/DCOM).

#### **9. 课程名称：软件需求工程**

(1) 课程编码：1241202

(2) 课程简介：该课程是软件工程专业的专业核心课程。目的是使得学生对系统尤其是软件系统的需求的目的、作用、分析和管理的系统的理解和初步的体会。课程内容包括需求工程的基本概念和知识、需求的表达、获取、分析和管理的的基本方法、以及在软件系统生命周期和过程中与其它相关部分的关系。并在此基础上让学生对主要方法、技术与工具有全面和一定程度的掌握。

#### **9. Course Name: Software Requirements Engineering**

(1) Course Code: 1241202

(2) Brief Introduction of the Course: This course is a core course in software engineering. The objectives of the course are: to enable students establish a systematic understanding of the goals, effects, analysis and management of the requirements of a system, especially of a software system; and to let students obtain basic capability and experience in performing requirement related activities. The contents of the course include: basic concepts and knowledge of software engineering requirement engineering, representations of requirements, techniques and methods of requirement acquisition, analysis and management, and its relationship with other components/portions within the software life cycle and process. Students are supposed to build up a certain degree of proficiency on the main methods, techniques and tools in software requirement engineering.

#### **10. 课程名称：软件过程与项目管理**

(1) 课程编码：1241418

(2) 课程简介：该课程是软件工程专业的专业核心课程。目的是使得学生对软件过程尤其是在软件过程下的项目管理有系统的理解和实践体会。课程内容包括：能力成熟度模型介绍；软件过程制订和裁剪；软件项目管理的主要内容和活动。这一课程采用基于项目和团队的主动学习和协作学习方式。课程讲授基本概念和方法，学生分为团队，每个团队选择一个具有真实项目背景的项目，按照软件项目管理和规范（模板和指南）要求完成一系列项目实践和提交物。本课程结束时要求学生具备软件项目管理的基本知识和理解、相关的基本技能尤其是团队工作技能、并同时掌握相关的英语术语和交流沟通能力。

#### **10. Course Name: Software Process and Project Management**

(1) Course Code: 1241418

(2) Brief Introduction of the Course: This course is a core course in software engineering. The objective of the course is to enable students to establish a systematic understanding and obtain a solid practice experience of the software process, especially of the project management in the context of software process. The contents of the course contain: an introduction of CMM/CMMI; software process design and tailoring; the key knowledge and activities of software project management. The teaching and management of the course take an active and collaborative learning approach. The lectures cover the basic concepts and methods. Students will be organized into teams. Each team chooses a project with real world project background, and performs a sequence of activities with required deliverables, following software project management process and protocols (guidelines and templates). By the end of the course, students are expected to have the abilities as follows: (a) a basic understanding of software project management, (b) a basic capability in related skills, (c) especially a capability of teamwork, and (d) an English vocabulary related to software project management.

#### **11. 课程名称：Web 信息系统设计与开发**

(1) 课程编码：1242420

(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。

#### **11 Course Name: Web Information System Design and Development**

(1) Course Code: 1242420

(2) Brief Introduction of 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. By the end of the class, students should be familiar with these concepts and have some experience both with building Web services and interacting with them programmatically.

## **12. 课程名称：研究方法与学术论文写作指导**

(1) 课程编码：1241004

(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。该课程帮助学生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。

### **12. Course Name: Research Methods and Academic Writing**

(1) Course Code: 1241004

(2) Brief Introduction of the Course: The course mainly includes topic selection of researching papers, three types and writing methods of researching papers, and basic characteristics, classification, format, selection and writing of scientific papers, and the problems that shall be avoided during the writing of scientific papers.

## **13. 课程名称：软件项目开发实训**

(1) 课程编码：1241421

(2) 课程简介：该课程是软件工程专业培养综合实践能力的重要专业选修课程。目的是培养学生能够使用在此之前所学习的计算和软件工程知识以解决软件工程实践问题的基本能力。课程采用基于项目和基于团队的教学和组织方式。每个团队针对一个实际项目，教师作为团队指导者，项目相关方作为项目客户。每个项目开发和/或维护采用迭代过程。学生团队将按照项目相关方的需求和要求进行开发和维护。最后考核以项目符合项目相关方要求、项目管理过程、以及每个学生的实际完成工作和质量综合进行。本课程结束时要求学生具备初步的软件开发和/或维护实践能力、基本的沟通与团队协作、以及使用项目所需要开发和维护工具的能力。

### **13. Course Name: Development Practice of Software Project**

(1) Course Code: 1242421

(2) Brief Introduction of the Course: This course is an important elective course in building integrated practical problem solving capability in software engineering discipline. The objective of the course is to enable students to build up a basic capability in solving software engineering problems by using knowledge and skills in computing and software engineering obtained in previous courses. The teaching and organization of the course takes a project-oriented and teamwork-based approach. Each student team takes a real project. The instructor takes a role as a mentor while the project stakeholder takes a role as the project user. A student team performs the development and/or maintenance of the project according to the requirements and standards of the project stakeholders. The assessment of the performance of each student is based on an integration of following aspects: (a) the quality of the deliverables required by the project stakeholders; (b) the project management process; and (c) the work and quality of the work accomplished by the student. By the end of the course, students are expected to have: (a) a basic capability of software development/maintenance; (b) a basic skill in project communication and collaboration; and (c) a capability of using development/maintenance environments/tools as required by the project.

## **14. 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。

### **14. Course Name: Compiling Principles**

(1) Course Code: 1241996

(2) Brief Introduction of the Course: The course gives an overview of the internal structure of modern compilers. It presents basic concepts in compiler design such as the implementation techniques, lexical scanning, parsing, type checking and code generation, dataflow analysis and other optimization techniques,

storage management, and execution environments.

### **15. 课程名称：概率论与数理统计**

(1) 课程编码：1242005

(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。

#### **15. Course Name: Probability and Statistics**

(1) Course Code: 1242005

(2) Brief Introduction of the Course: This course is a unique compulsory course to deal with random phenomena, which studies statistical law and statistical inference of random phenomena. Undergraduates are supposed to grasp the basic theories and approaches to deal with random phenomena, and to obtain the capability to analyze and solve practical problems.

### **16. 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。

#### **16. Course Name: Advanced English**

(1) Course Code: 1242431

(2) Brief Introduction of the Course: Advanced English is a course that aims at improving students' English synthetical skills and English communication capability. The course expects to expand students' scope of knowledge, strengthen students' understanding of society and life, develop their ability in terms of analysis, logical thinking and independent thinking through reading a wide range of materials, covering politics, economy, society, language, literature, education, philosophy, religion and Natural Science. The purposes of increasing sensitivity of cultural differences and promoting English language skills are also included.

### **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：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。

#### **18. Course Name: Parallel Processing and Distributed Computing**

(1) Course Code: 1242434

(2) Brief Introduction of the Course: This course teaches students, in the distributed environments, how to master the technology and application of parallel programming through using the 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.

#### **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探讨，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 Practice**

(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：服务计算**

(1) 课程编码：1242435

(2) 课程简介：服务计算是一种先进的企业应用开发与集成的技术。通过服务计算，企业应用具有更好的集成性、扩展性和灵活性，能够更好的支持企业快速和高质量的提供服务，从而提升企业的竞争力。本课程的目的是介绍服务计算的原理、基本理论和基本技术。通过本课程，学生将能够理



解服务计算的基本原理、了解服务计算的基本技术、掌握 Web 服务并具备初步的 Web 服务设计与开发能力，同时对于一些基于服务计算的典型企业应用有所了解。

### **21. Course Name: Service Computing**

(1) Course Code: 1242435

(2) Brief Introduction of the Course: Service computing is an advanced technology for enterprise application development and integration. Enterprise applications based on service-oriented architecture have better support for integration, extension and flexibility. This enables enterprises to provide their services more quickly with higher quality, hence increases the competitiveness in the market. The objectives of this course are to introduce the principles, basic theory and technologies of service computing as the entry level course for computing undergraduate students. By the end of the course, students are supposed to have a basic understanding of the principles and concepts of service computing, to have a systematic knowledge on the basic technologies of service computing, to have a good understanding and knowledge for basic web services design and development, and to have knowledge and experience of typical service oriented enterprise applications.

### **22. 课程名称：商务智能**

(1) 课程编码：1242440

(2) 课程简介：该课程向学生系统介绍商务智能领域的基础知识、基本原理和技术方法。核心内容包括数据仓库技术、数据挖掘基本概念和基本方法；同时介绍同时结合经济和管理实例，说明如何通过商务智能的方法来分析企业经营、优化企业运作，从而提升企业竞争优势。

### **22. Course Name: Business Intelligence**

(1) Course Code: 1242440

(2) Brief Introduction of the Course: This course system is introduced in the field of business intelligence to students' basic knowledge, basic principle and technical method. Core content including data warehouse technology, data mining basic concept and basic method; Introduced at the same time, combining the economic and management at the same time, to show how to analyze enterprise management by using the method of business intelligence, optimization of enterprise operation, so as to improve enterprise competitive advantage.

### **23. 课程名称：软件测试技术**

(1) 课程编码：1242437

(2) 课程简介：软件测试是软件开发的一个重要环节，该课程全面、系统地讲授测试技术，训练学生掌握软件测试基本方法和工具为目的。它不仅是软件工程等专业核心课程的延伸和细化，而且对于培养具有团队精神的软件开发人才、软件测试工程师具有十分重要的意义。

### **23. Course Name: Software Testing**

(1) Course Code: 1242437

(2) Brief Introduction of the Course: This course presents the concepts and techniques for testing software and assuring its quality. The course will attempt to prepare students to test software in structured, organized ways. This course provides practical knowledge of a variety of ways to test software, an understanding of the tradeoffs between testing techniques, and a desire for the practice of software testing and the research in software testing.

### **24. 课程名称：CMMI 与 PSP**

(1) 课程编码：1242438

(2) 课程简介：对于软件和服务过程的管理与控制是保证软件和服务质量的基本要求。能力成熟度集成模型是帮助企业/机构持续改进其过程管理与控制的主要方法之一。一个企业/机构的能力成熟度显示出该企业/机构对于软件和服务质量的保证和控制能力。企业/机构是由团队构成，每个团队又由个体专业人员组成，因此个人软件过程是保证团队乃至企业/机构软件过程的重要基础。该课程对能力成熟度集成模型进行介绍，并针对如何改进和提升企业/机构的能力成熟度介绍规范和方法。同时

系统的介绍个人软件过程,使得每个专业人员的个人技能和发展与企业/机构的成熟度持续提升结合起来。通过本课程的学习,学生将理解软件过程与软件质量等关键概念、理解能力成熟度模型和个人软件过程的概念和要求、并具备初步的作为软件团队成员所需要具备的知识、技能和能力。

#### **24. Course Name: CMMI and PSP**

(1) Course Code: 1242438

(2) Brief Introduction of the Course: The management and control of software and services processes is essential for the quality of software and services. CMMI is a major method to help enterprises continuously improve their process management capability. The maturity of an enterprise indicates the capability level of the quality management of the enterprise. A software enterprise is formed by software teams while a software team is formed by individual professionals. Hence the personal software process is important for CMMI. This course introduces CMMI as well as PSP, the requirement and approach for improving the process capabilities. By the end of the course, students are supposed to understand the important concepts such as software process and software quality, to understand the basic concept and framework of CMMI and PSP, to have the basic knowledge, skill and ability on CMMI and PSP in order to be a member of an effective software team.

#### **25. 课程名称: 人机交互的软件工程方法**

(1) 课程编码: 1242439

(2) 课程简介: 该课程是涉及计算机科学、心理学、人机工程学等多个学科。课程向学生讲授各种用于交互式产品开发的软件分析、设计和评估技术,包括:可用性工程、人机交互界面的经典模型、人机交互的需求工程方法、人机交互的设计方法(设计原则;交互模式;可视化设计;交互式设计)、人机交互的实现,以及人机交互的评估技术(启发式评价;专家评审;观察与调查用户;用户测试与预测模型)等。

#### **25. Course Name: Software Engineering Method of Human-Computer Interaction**

(1) Course Code: 1242439

(2) Brief Introduction of the Course: Human-Computer-Interaction (HCI) is an inter-discipline, which involves Computer Science, Psychology and Human-Computer Engineering and other related subject. This course presents variety of techniques applied to interactive product developing including software analysis, design and evaluation. The course mainly covers usability engineering, classical model of HCI, requirement analysis of HCI, system design of HCI(design principles, interaction patterns, visualization design, interaction design), the implementation of HCI, and different evaluation methods of HCI(heuristic evaluation, expert evaluation, observation and investigation evaluation, user testing and predicting model).

#### **26. 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。该课程帮助学生熟练掌握 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。

#### **26. Course Name: Database Applications**

(1) Course Code: 1242430

(2) Brief Introduction of the Course: The course is based on a specific development platform (Oracle database), introducing database management and foreground application development technologies. It aims to practice database development and application skills, guiding students to complete a variety of tasks including requirement analysis, conceptual design, logistical design, physical design, code design and test run. The knowledge of software engineering and object-oriented programming method will be addressed throughout the whole course. Students are expected to grasp Oracle database architecture, Oracle database

operations, its development tools, and are able to design a proper database and develop a C/S structure based database application system at the end of the course.

### **27. 课程名称：可视化建模与 UML**

(1) 课程编码：1242436

(2) 课程简介：统一建模语言 UML 是一个通用的可视化建模语言，用于对软件进行描述、可视化处理、构造和建立软件系统制品的文档。该课程介绍 UML 语言的基础知识以及 UML 在面向对象的软件系统分析和设计中的应用，并通过实例讲解系统的面向对象分析与设计过程以及如何用 UML 语言为系统建模。

### **27. Course Name: Visual Modeling and UML**

(1) Course Code: 1242436

(2) Brief Introduction of the Course: This course presents the basic concepts of UML and the application of UML in the description of software, visual treatment, and the development of software. It describes the OOP analysis and design process and how to use UML in system modeling with practical examples.

### **28. 课程名称：算法分析与设计**

(1) 课程编码：1242033

(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。

### **28. Course Name: Algorithm Analysis and Design**

(1) Course Code: 1242033

(2) Brief Introduction of the Course: This 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.

## **(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；了解企事业单位的企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.

## 软件工程专业修读指南

### Study Guidance to Software Engineering Specialty

#### 一、指导性教学计划

第一学期			第二学期		
课程号	课程名称	学	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	1221009	高等数学（二）	3
1221006	高等数学（一）	4	1241409	数据库原理	3.5
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 19.5 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 3-8 学期中，须修读专业方向课程 18 学分，专业拓展课程 6 学分。 (2) 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	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
1222031	数据结构与算法	5	1011042	大学体育（四）	1
1241036	计算机组织与结构	4.5	1241415	计算机网络	4.5
1241413	软件工程	3	1241408	操作系统（一）	3.5
1241419	JAVA 语言程序设计	3	1241030	软件体系结构	3
专业方向课程			专业方向课程		
1242430	数据库应用 (方向 1*、方向 2*)	2	1242436	可视化建模与 UML (方向 1*、方向 2*)	3.5
合计	必修 22.5 学分，选修 0-2 学分		合计	必修 21 学分，选修 0-3.5 学分	
注：软件工程创新人才方向记为方向 1* 卓越工程师方向记为方向 2*			(1) 本学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	课程号	课程名称	学分
1241202	软件需求工程	4	1241421	软件项目开发实训	4
1241418	软件过程与项目管理	3	1241996	编译原理	3.5
1241420	Web 信息系统设计与开发	3	1241004	研究方法与学术论文写作	1
专业方向课程			专业方向课程		

1242033	算法分析与设计 (方向 1*、方向 2*)	3	1242447	高等数学综合提高 (方向 1*)	3
1242005	概率论与数理统计 (方向 1*)	3	1242434	并行处理与分布式计算 (方向 1*)	3
1242431	高级英语 (方向 1*)	3	1242438	CMMI 与 PSP (方向 2*)	3
1242435	服务计算 (方向 2*)	3	1242439	人机交互的软件工程方法	3
1242427	可视化程序设计 (方向 2*)	3	1242437	软件测试技术 (方向 2*)	3.5
1242428	网络工程 (方向 2*)	3			
1242440	商务智能 (方向 2*)	3			
<b>专业拓展课程</b>			<b>专业拓展课程</b>		
1243001	专业英语	2	1243434	高级程序设计	2
1243432	高级数据结构	2	1243433	操作系统 (二)	2
1243421	微机原理与接口技术	2.5	1243423	移动计算	1.5
1243422	计算机图形学	1.5	1243425	Android 应用开发	1.5
			1243424	数字图像处理技术	1.5
合计	必修 10 学分, 选修 0-29 学分		合计	必修 8.5 学分, 选修 0-24 学分	
注: 软件工程创新人才方向记为方向 1* 卓越工程师方向记为方向 2*			(1) 到本学期末, 应完成通识教育选修课 8 学分的修读。		
<b>第七学期</b>			<b>第八学期</b>		
<b>课程号</b>	<b>课程名称</b>	<b>学</b>	<b>课程号</b>	<b>课程名称</b>	<b>学分</b>
1250024	专业实习	2	1250025	毕业论文 (设计)	2
<b>专业拓展课程</b>			<b>专业拓展课程</b>		
1243428	电子商务	2	1243430	计算机新技术	1
1243426	信息安全	1.5	1243429	创新创业指导	1
1243427	智能计算	1.5	1243431	网路安全	2
合计	必修 2 学分, 选修 0-5 学分		合计	必修 2 学分, 选修 0-4 学分	
(1) 专业实习为两个月。 (2) 到本学期末, 应完成专业方向课程 18 学分的修读。 注: 软件工程创新人才方向记为方向 1* 卓越工程师方向记为方向 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) 到本学期末, 总学分应不得少于 148 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

软件工程专业, 非师范专业, 学制四年, 修业年限为 4-6 年, 授工学学士学位。

### 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. 学分要求

(1) 学生按软件工程本科教学计划表修读各门课程，总学分要求为 148 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 24 学分，专业课程模块不得低于 72 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 48 学分，专业方向课程至少选修 18 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（18 学分）中，选择软件工程创新人才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；选择卓越工程师方向学生的学分在该方向课程中至少选修 15 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，建议卓越工程师方向学生，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、计算机图形学、数字图像处理技术、网络安全、电子商务、创新创业指导课程中选修 6 学分；软件工程创新人才方向学生，在专业英语、高级数据结构、操作系统（二）、高级程序设计、电子商务、计算机新技术课程中选修 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软件工程专业教学计划表执行。