武汉理工大学计算机科学与技术学院

School of Computer Science & Technology of
Wuhan University of Technology

# 2014 版本科培养方案

Undergraduate Education Plan（2014）

**武汉理工大学教务处**

Academic Affairs Office of Wuhan University of Technology

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# 【计算机科学与技术专业】2014 版本科培养方案
# Undergraduate Education Plan for Specialty in Computer Science and Technology (2014)

| | | | |
|---|---|---|---|
| 专业名称 | **计算机科学与技术** | 主干学科 | **计算机科学与技术** |
| Major | Computer Science and Technology | Major Disciplines | Computer Science and Technology |
| 计划学制 | **四年** | 授予学位 | **工学学士** |
| Duration | 4 Years | Degree Granted | Bachelor of Engineering |
| 所属大类 | 计算机**类** | 大类培养年限 | **1.5 年** |
| Disciplinary | Computer Science and Technology | Duration | 1.5 years |

**最低毕业学分规定**

**Graduation Credit Criteria**

| 课程类 Course Classification / 课程性质 Course Nature | 通识课程 Public Basic Courses | 学科大类课程 Basic Disciplinary Courses | 专业课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践 Practice Courses | 课外学分 Study Credit after Class | 总学分 Total Credits |
|---|---|---|---|---|---|---|---|
| 必修课 Required Courses | 36.5 | 46.5 | 39 | \ | 21.5 | \ | 190 |
| 选修课 Elective Courses | 9 | \ | 17.5 | 10 | \ | 10 | |

## 一、培养目标与毕业要求

## Ⅰ Educational Objectives &Requirement

### （一） 培养目标

（1） 具有良好道德与修养，在科学研究、工程开发、应用实现中遵守法律法规，社会和环境意识强，有能力服务社会。

（2） 掌握基本科学方法，具有科学思维能力，能运用数学与自然科学基础知识解决实际问题。

（3） 系统地掌握计算机硬件、软件及计算机应用的基本理论和应用技术，具备一定的项目实践能力和综合技术素质。

（4） 具有口头和书面表达能力，并能在团队中发挥作用。

（5） 具备通过继续教育或其它的终身学习途径拓展自己的能力，紧跟学科和专业发展。

（1） Have good morals and self-cultivation, keep laws and regulations, and hold strong social consciousness and responsibility in research and development;

（2） Master the basic scientific methods, including scientific thinking skills, the abilities in solving problems using mathematics and natural science knowledge;

（3） Master the fundamental theories and technologies, have the good practice abilities of researching and developing computer software and hardware;

（4） Have oral and written communication skills and be good at teamwork;

（5） Have the abilities in self-improving through continuing education and other education methods and keep up with the cutting edge development of the profession.

## （二） 毕业要求

（1） 掌握从事计算机科学与技术专业工作所需的数学、自然科学知识以及一定的经济学与管理学知识。

（2） 掌握计算机科学与技术专业基础理论与知识，理解本专业的基本概念、知识结构、典型方法，建立良好的科学、人文素养和工程意识。

（3） 掌握计算机系统分析和设计的基本方法，具有综合运用所掌握的知识、方法、技术分析与解决实际问题的能力。

（4） 深入了解与本专业相关的职业和行业的法律、法规，恪守诚实正直的职业道德准则。

（5） 具有遵循软件开发相关规范、运用开发平台开发及系统测试的能力。

（6） 能了解计算机科学与技术及相关学科发展现状和趋势，并具有技术创新和产品创新初步能力。

（7） 具有终身学习意识，能够运用现代信息技术获取相关信息和新技术、新知识，并提升自我。

（8） 具有一定的组织管理能力、表达能力和人际交往能力以及在团队中发挥作用的能力。

（9） 具有英语综合应用能力，在未来工作和社会交往中，能用英语有效地进行口头和书面的信息交流，具有一定的国际视野和跨文化交流、竞争与合作能力。

（1） Master the knowledge of mathematics, natural science, economics and management, which is related with computer science and technology in

（2） Master the basic theoretical and professional knowledge of computer science and technology, and understand the related basic concepts, knowledge framework and classic methods, construct the good science and humanity literacy and engineering viewpoint,

（3） Master the basic research methodology of computer-based system analysis and design, have the ability in applying those skills to analyse and solve practical problems.

（4） Deeply understand the professional laws, rules and policies, uphold the professional ethics.

（5） Have the abilities to comply with the norms and standards about the software development, and the ability of platform-based development including system testing.

（6） Keep sense of the state of the art of computer science and related domains, have the basic ability in technical and product innovation.

（7） Have the ability in using information technology to obtain knowledge and novelty technology for self-improving with a lifelong learning attitude.

（8） Have the ability in team management and collaboration, expression and interpersonal communication, and working independently.

（9） Have the basic ability of applying English language in study, can efficiently undertake oral and written information exchange in English in the future work, and have the international professional view for cross-culture communication, competition and collaboration.

附：培养目标实现矩阵

| | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | ✓ | ✓ | | | |
| 毕业要求 2 | ✓ | ✓ | ✓ | | |
| 毕业要求 3 | | ✓ | ✓ | | |
| 毕业要求 4 | ✓ | | | | |
| 毕业要求 5 | | | ✓ | | |
| 毕业要求 6 | | | | | ✓ |
| 毕业要求 7 | | | | | ✓ |
| 毕业要求 8 | | ✓ | ✓ | ✓ | |
| 毕业要求 9 | | | | ✓ | |

## 二、专业核心课程与专业特色课程

## II Core Courses and Characteristic Courses

### （一） 专业核心课程：

离散结构、汇编语言程序设计、计算机组成原理、数据结构、操作系统、编译原理、数据库系统原理、计算机网络、高级语言程序设计、软件工程

Discrete structure, Assembly language programming, Principles of Computer Organization, Data Structure, Operating System, Principles of Compiler Construction, Principles of Database Systems, Computer Networks, Advanced Language Programming, and Software Engineering.

### （二） 专业特色课程：

计算机应用课群包括 JAVA 语言程序设计、可视化编程、信息系统分析与设计、多媒体技术、Web 技术。

JAVA Programming, Visualizing Programming, Information System Analysis and Design, Multimedia Design and Web Programming

附：毕业要求实现矩阵：

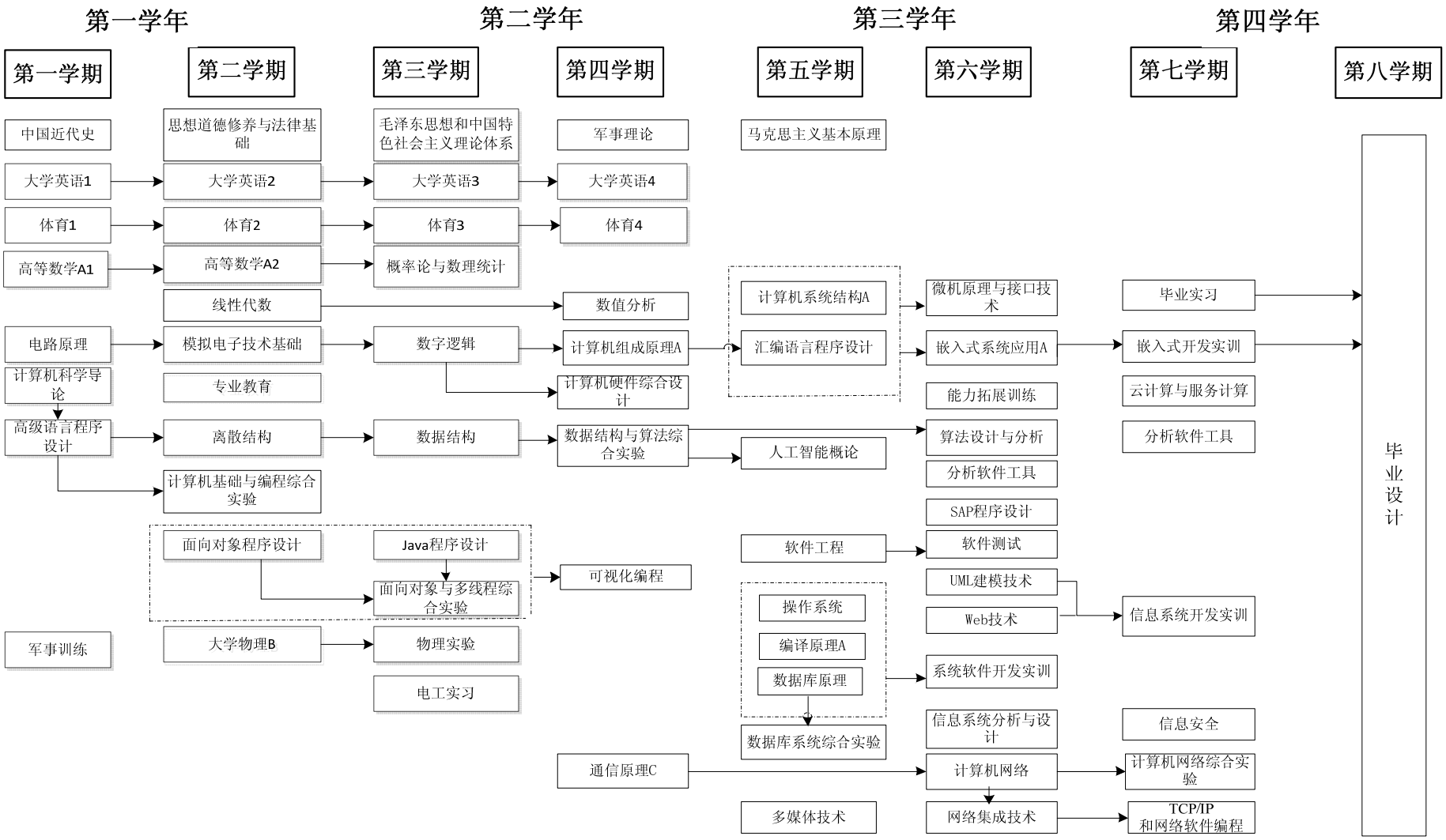
| 专业核心课程 | 专业特色课程 | 课程名称 | 计算机科学与技术专业毕业要求 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | | 思想道德修养与法律基础 | | | | ✓ | | | | | |
| | | 中国近现代史纲要 | | ✓ | | | | | | | |
| | | 计算机科学导论 | ✓ | ✓ | | ✓ | | ✓ | ✓ | | |
| | | 高级语言程序设计 A | | ✓ | ✓ | | ✓ | | | | |
| | | 毛泽东思想和中国特色社会主义理论体系概论 | | ✓ | | | | | | | |
| | | 马克思主义基本原理 | | ✓ | | | | | | | |
| | | 军事理论 | | ✓ | | | | | | | |
| | | 体育 | | | | | | | ✓ | | |
| | | 大学英语 | | | | | | | | | ✓ |

| 专业核心课程 | 专业特色课程 | 课程名称 | 计算机科学与技术专业毕业要求 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） | （9） |
| | | 高等数学 | ✓ | ✓ | | | | | | | |
| | | 电路原理 B | ✓ | ✓ | | | | | | ✓ | |
| | | 线性代数 | ✓ | ✓ | | | | | | | |
| | | 大学物理 B | ✓ | ✓ | | | | | | | |
| | | 物理实验 B | ✓ | ✓ | | | | | | | |
| ✓ | | 离散结构 | ✓ | ✓ | ✓ | | | | | | |
| | | 概率论与数理统计 B | ✓ | ✓ | | | | | | | |
| | | 电路分析基础 | ✓ | ✓ | | | | | | | |
| | | 模拟电子技术基础 C | ✓ | ✓ | | | | | | | |
| | | 计算机基础与编程综合 | | ✓ | ✓ | | ✓ | | ✓ | | |
| | | 面向对象程序设计 C | | ✓ | ✓ | | ✓ | | | | |
| | | 数字逻辑 | ✓ | ✓ | ✓ | | | | | | |
| ✓ | | 数据结构 | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | JAVA 语言程序设计 B | | ✓ | ✓ | | ✓ | | | | |
| | | 计算机数值分析 | ✓ | ✓ | ✓ | | | | | | |
| | | 数据结构与算法综合实验 | | ✓ | ✓ | | ✓ | | ✓ | | |
| ✓ | | 计算机组成原理 A | | ✓ | ✓ | | ✓ | | | | |
| ✓ | | 汇编语言程序设计 | | ✓ | ✓ | | ✓ | | | | |
| ✓ | | 编译原理 A | | ✓ | ✓ | | ✓ | ✓ | | | |
| ✓ | | 操作系统 A | | ✓ | ✓ | | ✓ | ✓ | | | |
| ✓ | | 数据库系统原理 | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | 数据库系统综合实验 | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| ✓ | | 软件工程 B | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | 嵌入式系统应用 A | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | 微机原理及接口技术 | | ✓ | ✓ | | ✓ | | | | |
| | | 计算机系统结构 | | ✓ | ✓ | | | | | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 计算机科学与技术专业毕业要求 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） | （9） |
| ✓ | | 计算机网络 | | ✓ | ✓ | | | ✓ | | | |
| | | 计算机网络综合实验 | | ✓ | ✓ | | | | ✓ | ✓ | |
| | | 人工智能概论 | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | UML 建模技术 | | ✓ | ✓ | | ✓ | | | | ✓ |
| | | 网络集成技术 | | ✓ | ✓ | | | | | | |
| | | 信息安全 | | ✓ | ✓ | | | ✓ | | | |
| | | TCP/IP 和网络软件编程 | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | 多媒体技术 | | ✓ | ✓ | | | ✓ | | | |
| | | SAP 程序设计 | | ✓ | ✓ | | ✓ | | | | |
| | | 分析软件工具 | | ✓ | ✓ | | ✓ | | | | |
| | | 软件测试 B | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | 信息系统分析与设计 | | ✓ | ✓ | | ✓ | | | | |
| | | Web 技术 | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | 可视化编程 | | ✓ | ✓ | | ✓ | | | | |
| | | 算法分析与设计 | | ✓ | ✓ | | | | | | |
| | | 通信原理 | ✓ | ✓ | ✓ | | | | | | |
| | | 云计算与服务计算 | | ✓ | ✓ | | | ✓ | | | |
| | | 军事训练 | | ✓ | | | | | | | |
| | | 专业教育 | | ✓ | | ✓ | | ✓ | ✓ | | |
| | | 电工电子实习 A | ✓ | ✓ | | | | | | | |
| | | 计算机软件综合开发实训 | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| | | 毕业实习 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 毕业设计（论文） | ✓ | ·✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 三、课程教学进程图

## Ⅲ　Teaching Process Map


第一学年
第二学年
第三学年
第四学年
第一学期
第二学期
第三学期
第四学期
第五学期
第六学期
第七学期
第八学期
中国近代史
思想道德修养与法律基础
毛泽东思想和中国特色社会主义理论体系
军事理论
马克思主义基本原理
大学英语1
大学英语2
大学英语3
大学英语4
体育1
体育2
体育3
体育4
高等数学A1
高等数学A2
概率论与数理统计
线性代数
数值分析
计算机系统结构A
微机原理与接口技术
毕业实习
电路原理
模拟电子技术基础
数字逻辑
计算机组成原理A
汇编语言程序设计
嵌入式系统应用A
嵌入式开发实训
计算机科学导论
专业教育
计算机硬件综合设计
能力拓展训练
云计算与服务计算
高级语言程序设计
离散结构
数据结构
数据结构与算法综合实验
人工智能概论
算法设计与分析
分析软件工具
分析软件工具
计算机基础与编程综合实验
SAP程序设计
面向对象程序设计
Java程序设计
软件工程
软件测试
可视化编程
面向对象与多线程综合实验
UML建模技术
Web技术
信息系统开发实训
操作系统
编译原理A
数据库原理
系统软件开发实训
军事训练
大学物理B
物理实验
电工实习
信息系统分析与设计
信息安全
数据库系统综合实验
通信原理C
计算机网络
计算机网络综合实验
多媒体技术
网络集成技术
TCP/IP
和网络软件编程
毕业设计

## 四、理论教学建议进程表

## Ⅳ Theory Course Schedule

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 通识课程 Public Basic Courses | 必修课 Required Courses | 4220001111 | 思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law | 3 | 48 | | | 8 | | 1-6 | | |
| | | 4220002111 | 中国近现代史纲要 Outline of Contemporary and Modern Chinese History | 2 | 32 | | | | | 1-6 | | |
| | | 4120027111 | 计算机科学导论 Introduction to Computer Science | 2.5 | 40 | 10 | | | | 1 | | |
| | | 4120020111 | 高级语言程序设计 A Advanced Language Programming A | 4 | 64 | 16 | | | | 1 | | |
| | | 4220003111 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 4 | 96 | | | 32 | | 1-6 | | |
| | | 4220005111 | 马克思主义基本原理 Marxism Philosophy | 3 | 48 | | | 8 | | 1-6 | | |
| | | 1060001111 | 军事理论 Military Theory | 1 | 32 | | | 16 | | 2-4 | | |
| | | 1050001131 | 心理健康教育 Mental Health Education | 1 | 16 | | | | | 1-2 | | |
| | | 4210001111 | 体育 1 Physical Education Ⅰ | 1 | 32 | | | | | 1 | | |
| | | 4210002111 | 体育 2 Physical Education Ⅱ | 1 | 32 | | | | | 2 | 体育 1 | |
| | | 4210003111 | 体育 3 Physical Education Ⅲ | 1 | 32 | | | | | 3 | 体育 2 | |
| | | 4210004111 | 体育 4 Physical Education Ⅳ | 1 | 32 | | | | | 4 | 体育 3 | |
| | | 4030002111 | 大学英语 A1 College English A Ⅰ | 3 | 64 | | | | 16 | 1 | | |
| | | 4030003111 | 大学英语 A2 College English A Ⅱ | 3 | 64 | | | | 16 | 2 | 大学英语 A1 | |
| | | 4030004111 | 大学英语 A3 College English A Ⅲ | 3 | 64 | | | | 16 | 3 | 大学英语 A2 | |
| | | 4030005111 | 大学英语 A4 College English A Ⅳ | 3 | 64 | | | | 16 | 4 | 大学英语 A3 | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 36.5 | 760 | 26 | | 64 | 64 | | | |
| | 选修课 Elective Courses | 创新创业类 Innovation and Entrepreneurship Courses | | 全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。<br>All students are required to obtain at least 9 credits, and must select art courses from *Art and Physical Education Courses* to obtain at least 2 credits. Science and engineering students should select at least one course from *Arts and Social Science Courses* or *Economy and Management Courses*, and other students should select at least one course from *Science and Technology Courses*. | | | | | | | | |
| | | 人文社科类 Arts and Social Science Courses | | | | | | | | | | |
| | | 经济管理类 Economy and Management Courses | | | | | | | | | | |
| | | 科学技术类 Science and Technology Courses | | | | | | | | | | |
| | | 艺术体育类 Art and Physical Education Courses | | | | | | | | | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| 学科大类课程 Basic Disciplinary Courses | 必修课 Required Courses | 4050063111 | 高等数学 A1<br>Advanced Mathematics A Ⅰ | 5 | 80 | | | | | 1 | | |
| | | 4050064111 | 高等数学 A2<br>Advanced Mathematics A Ⅱ | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4110019111 | 电路原理 B<br>Circuit Principle B | 4 | 64 | 16 | | | | 1 | | |
| | | 4050229111 | 线性代数<br>Linear Algebra | 2.5 | 40 | | | | | 2 | | |
| | | 4050463131 | 大学物理 B<br>Physics B | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4050224111 | 物理实验 B<br>Physics Lab. B | 1 | 32 | 32 | | | | 3 | 大学物理 B | |
| | | 4120045111 | 离散结构<br>Discrete Structures | 4 | 64 | | | | | 2 | 计算机科学导论 | |
| | | 4050058111 | 概率论与数理统计 B<br>Probability and Mathematics Statistic B | 3 | 48 | | | | | 3 | 高等数学 A2 | |
| | | 4110050111 | 模拟电子技术基础 C<br>Analog Electronic Techniques C | 3 | 48 | 8 | | | | 3 | 高等数学 A2 | |
| | | 4120261141 | 计算机基础与编程综合实验<br>Experiments on Computer and Programming | 1 | 32 | 32 | | | | 2 | | |
| | | 4120048111 | 面向对象程序设计 C<br>Object-oriented Methodology | 2.5 | 40 | | 12 | | | 2 | 高级语言程序设计 A | |
| | | 4120263141 | 面向对象与多线程综合实验<br>Experiments on Object-oriented and Multithreading Programming | 1 | 32 | 32 | | | | 3 | | |
| | | 4120079111 | 数字逻辑<br>Digital Circuits | 3 | 48 | 8 | | | | 3 | 模拟电子技术基础 C | |
| | | 4120264141 | 数据结构 A<br>Data Structures | 4 | 64 | | 16 | | | 3 | 高级语言程序设计 A | |
| | | 4120299141 | JAVA 语言程序设计 B<br>Java Programming B | 2.5 | 40 | | 8 | | | 3 | 高级语言程序设计 A | |
| | | 小计 Subtotal | | 46.5 | 792 | 128 | 36 | | | | | |
| 专业课程 Specialized Courses | 必修课 Required Courses | 4120028111 | 计算机数值分析<br>Computer Numerical Analysis | 2.5 | 40 | | 8 | | | 4 | 线性代数 | |
| | | 4120265141 | 数据结构与算法综合实验<br>Experiments on Data Structure and Algorithm | 1 | 32 | 32 | | | | 4 | | |
| | | 4120042111 | 计算机组成原理 A<br>Computer Organization A | 4.5 | 72 | 10 | | | | 4 | 数字逻辑 | |
| | | 4120060111 | 软件工程 B<br>Introduction to Software Engineering | 2.5 | 40 | | 8 | | | 5 | | |
| | | 4120165121 | 汇编语言程序设计<br>Assembly Language Programming | 4 | 64 | 16 | | 16 | | 5 | | |
| | | 4120266141 | 编译原理 A<br>Compiler Principles A | 4.5 | 72 | | 8 | 12 | | 5 | 高级语言程序设计 A | |
| | | 4120267141 | 操作系统<br>Operating System | 4.5 | 72 | | 8 | 12 | | 5 | 计算机组成原理 | |
| | | 4120268141 | 数据库系统原理<br>Principles of Database Systems | 3.5 | 56 | | 12 | | | 5 | 数据结构 | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| | | 4120039111 | 计算机系统结构 A<br>Computer Architecture A | 2.5 | 40 | | | | | 5 | 计算机组成原理 | |
| | | 4120270141 | 数据库系统综合实验<br>Experiments on Database System | 1 | 32 | 32 | | | | 5 | | |
| | | 4120034111 | 计算机网络 C<br>Computer Networks C | 2.5 | 40 | | | | | 6 | | |
| | | 4120052111 | 嵌入式系统应用 A<br>Embedded System and Application A | 2.5 | 40 | 6 | | | | 6 | 汇编语言程序设计 | |
| | | 4120094111 | 微机原理及接口技术 B<br>Microcomputer and Interfacing B | 2.5 | 40 | 8 | | | | 6 | 计算机组成原理 | |
| | | 4120271141 | 计算机网络综合实验<br>Experiments on Computer Network | 1 | 32 | 32 | | | | 7 | 计算机网络 C | |
| | | 小 计 Subtotal | | 39 | 672 | 136 | 44 | 40 | | | | |
| | 选修课 Elective Courses | 4120084111 | 通信原理 C<br>Communication Principles C | 2.5 | 40 | 8 | | | | 4 | | |
| | | 4120044111 | 可视化编程<br>Visual Programming | 2.5 | 40 | 10 | | | | 4 | | |
| | | 4120008111 | UML 建模技术<br>UML Modeling Technology | 2 | 32 | | | | | 6 | 软件工程 B | |
| | | 4120087111 | 网络集成技术<br>Network Integration Technology | 2 | 32 | 6 | | | | 6 | 计算机网络 C | |
| | | 4120197131 | SAP 程序设计<br>SAP Programming | 4 | 64 | | | 16 | | 6 | 数据库系统原理 | |
| | | 4120058111 | 软件测试 B<br>Software Testing B | 2 | 32 | 8 | | | | 6 | 软件工程 B | |
| | | 4120081111 | 算法设计与分析 A<br>Algorithm Design and Analysis A | 2.5 | 40 | | 8 | | | 6 | 数据结构 | |
| | | 4120102111 | 信息安全<br>Information Security | 2 | 32 | 6 | | | | 7 | | |
| | | 4120006111 | TCP/IP 和网络软件编程<br>TCP/IP and Network Programing | 2.5 | 40 | | 10 | | | 7 | 计算机网络 C | |
| | | 4120018111 | 多媒体技术<br>Multimedia Technology | 2 | 32 | 6 | | | | 7 | | |
| | | 4120019111 | 分析软件工具<br>Analysis Software Tool | 2 | 32 | | 8 | | | 7 | | |
| | | 4120103111 | 信息系统分析与设计<br>Information System Analysis and Design | 2 | 32 | 6 | | | | 7 | 数据库系统原理 | |
| | | 4120009111 | Web 技术<br>Web Technology | 2 | 32 | | 6 | | | 7 | | |
| | | 4120083111 | 云计算与服务计算<br>Cloud & Service Computing | 2 | 32 | 6 | | | | 7 | | |
| | | 4120055111 | 人工智能概论<br>Artificial Intelligence | 2 | 32 | | | | | 7 | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 34 | 544 | 56 | 32 | 16 | | | | |
| | | 修读说明：要求至少选修 17.5 学分。<br>NOTE：Minimum subtotal credits: 17.5. | | | | | | | | | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| 个性课程 Personalized Course | 选修课 Elective Courses | 4120240131 | 移动终端应用开发<br>Mobile Terminal Application Development | 2 | 32 | 12 | | | | 6 | | |
| | | 4120241131 | 软件框架应用技术<br>Application Technology of Software | 2 | 32 | 12 | | | | 6 | | |
| | | 4120242131 | 大数据分析技术<br>Data Analysis Technology | 2 | 32 | 8 | | | | 6 | | |
| | | 4120243131 | ERP 系统原理与实践<br>Principles and Practice of ERP System | 2 | 32 | | | | | 6 | | |
| | | 小 计 Subtotal | | 8 | 128 | 32 | | | | | | |
| | | 修读说明：学生从以上个性课程和学校发布的其它专业的个性课程列表中选课，要求至少选修 10 学分。<br>NOTE：Students can choose any courses from above courses or other majors' personalized courses released by the university. Minimum subtotal credits: 10. | | | | | | | | | | |

## 五、集中性实践教学环节

## Ⅴ Practice Schedule

| 课程编号 Course Number | 实践环节名称 Practice Courses Name | 周数 Weeks | 学分 Crs | 建议修读学期 Suggested Term |
|---|---|---|---|---|
| 1060002111 | 军事训练<br>Military Training | 3 | 1.5 | 1 |
| 4120141111 | 专业教育<br>Professional Education | 1 | 1 | 3 |
| 4100068111 | 电工电子实习 A<br>Practice in Electrical Engineering & Electronics A | 2 | 2 | 3 |
| 4120203131 | 计算机软件综合开发实训<br>Computer Software Integrated development | 3 | 3 | 7 |
| 4120112111 | 毕业实习<br>Practical Training for Graduation | 3 | 3 | 7 |
| 4120184121 | 毕业设计<br>Graduation Design (Thesis) | 17 | 11 | 8 |
| 小 计 Subtotal | | 29 | 21.5 | |

## 六、修读指导

## Ⅵ Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：袁景凌

专业培养方案责任人：彭德巍

# 【软件工程专业】2014 版本科培养方案
# Undergraduate Education Plan for Specialty in Software Engineering (2014)

| | | | |
|---|---|---|---|
| 专业名称 | **软件工程** | 主干学科 | **软件工程** |
| Major | Software Engineering | Major Disciplines | Software Engineering |
| 计划学制 | **四年** | 授予学位 | **工学学士** |
| Duration | 4 Years | Degree Granted | Bachelor of Engineering |
| 所属大类 | **计算机类** | 大类培养年限 | **1.5 年** |
| Disciplinary | Computer | Duration | 1.5 years |

**最低毕业学分规定**

**Graduation Credit Criteria**

| 课程类 Course Classification / 课程性质 Course Nature | 通识课程 Public Basic Courses | 学科大类课程 Basic Disciplinary Courses | 专业课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践 Practice Courses | 课外学分 Study Credit after Class | 总学分 Total Credits |
|---|---|---|---|---|---|---|---|
| 必修课 Required Courses | 36.5 | 46.5 | 37 | \ | 21.5 | \ | 190 |
| 选修课 Elective Courses | 9 | \ | 19.5 | 10 | \ | 10 | |

## 一、培养目标与毕业要求

## Ⅰ Educational Objectives &Requirement

### （一） 培养目标

（1） 具有良好道德与修养，在科学研究、工程开发、应用实现中遵守法律法规，社会和环境意识强，有能力服务社会。

（2） 掌握基本科学方法，具有包括计算思维在内的科学思维能力，运用数学与自然科学基础知识解决实际问题。

（3） 具备运用先进的工程化方法、技术和工具从事软件系统的分析、设计、验证、确认、实现、应用和维护，以及软件系统开发管理等的能力，在相关领域具有就业竞争力。

（4） 具有口头和书面表达能力，并能在团队中有效发挥作用。

（5） 具备通过继续教育或其它的终身学习途径拓展自己的能力，紧跟学科和专业发展。

（1） Have good morals and self-cultivation, keep laws and regulations, and hold strong social consciousness and responsibility in research and development;

（2） Master the basic scientific methods, including Scientific thinking skills, the abilities in solving problems using mathematics and natural science knowledge;

（3） Master the skills in applying advanced engineering methods and tools to software system analytic, design, verification, implementation, maintenance and management with high competitive strength in employment;

（4） Have oral and written communication skills and be good at teamwork;

（5） Have the abilities in self-improving through continuing education and other education methods and keep up with the cutting edge development of SE.

（二） 毕业要求

（1） 掌握从事软件工程专业工作所需的数学、自然科学知识以及一定的经济学与管理学知识。

（2） 系统掌握软件工程专业基础理论知识和专业知识，经历系统的专业实践，理解计算和软件工程学科的基本概念、知识结构、典型方法，建立数字化、算法与复杂性、重用等核心专业意识。

（3） 掌握软件工程学科的基本思维方法和研究方法，具有良好的科学素养和强烈的工程意识，并具备综合运用所掌握的知识、方法、技术和工具解决实际软件问题，并对结果进行分析的能力。

（4） 具有终身学习意识，能够运用现代信息技术获取相关信息和新技术、新知识，持续提高自己的能力。

（5） 了解计算和软件工程学科发展现状和趋势，具有创新意识，并具有技术创新和产品创新初步能力。

（6） 了解与软件工程专业相关的职业和行业的重要法律、法规及方针与政策，理解工程技术与信息技术应用相关的伦理基本要求，在系统设计过程中能够综合考虑经济、环境、法律、安全、健康、伦理等制约因素。

（7） 具有一定的组织管理能力、表达能力、独立工作能力、人际交往能力和团队合作能力。

（8） 具有初步的外语应用能力，能阅读软件工程及相关专业的外文材料，具有一定的国际视野和跨文化交流、竞争与合作能力。

（1） Master the knowledge of SE in mathematics, natural science, economics and management.

（2） Master the basic theoretical and professional knowledge of software engineering and understand the basic concepts, knowledge structure, and classic methods of SE, especially the deep understanding on digital, algorithm and its complexity and reuse of SE.

（3） Master the basic research methodology of SE, good scientific literacy and engineering viewpoint, the ability in applying the learned skills to analyse and solve software engineering problems.

（4） Have the ability in using information technology to obtain knowledge and new technology for self-improving with a lifelong learning attitude.

（5） Know the state of the art of CS and SE and have the ability in technical and products innovation.

（6） Know the laws, rules and policies of SE industry and business, the ethics of information engineering, the various factors in system design including economics, environment, laws, security, health and so forth.

（7） Have the ability in team management and collaboration, expression and interpersonal communication, and working independently.

（8） Have the ability in understanding and reading English literature of SE and related majors and have the international view of SE for cross-culture communication, competition and collaboration.

附：培养目标实现矩阵

| | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | | ✓ | ✓ | | |
| 毕业要求 2 | | ✓ | ✓ | | |
| 毕业要求 3 | | ✓ | ✓ | | |
| 毕业要求 4 | ✓ | | ✓ | | ✓ |
| 毕业要求 5 | | | ✓ | | ✓ |
| 毕业要求 6 | ✓ | | | ✓ | ✓ |
| 毕业要求 7 | | | ✓ | ✓ | |
| 毕业要求 8 | | | | ✓ | |

## 二、专业核心课程与专业特色课程

## II Core Courses and Characteristic Courses

### （一） 专业核心课程：

高级语言程序设计、离散结构、数据结构、计算机组成原理、操作系统、计算机网络、软件工程导论、软件设计与体系结构、软件项目管理、软件测试。

Advanced Language Programming, Discrete Structure, Data Structure, Principles of Computer Organization, Operating System, Computer Network, Introduction to Software Engineering, Software Design and Architecture, Software Project Management, Software Testing.

### （二） 专业特色课程：

网络软件系统设计技术、嵌入式应用软件开发、人机智能交互技术。

Network Software System Design, Embedded Application Software Development，Human-Computer Intelligent Interaction.

附：毕业要求实现矩阵：

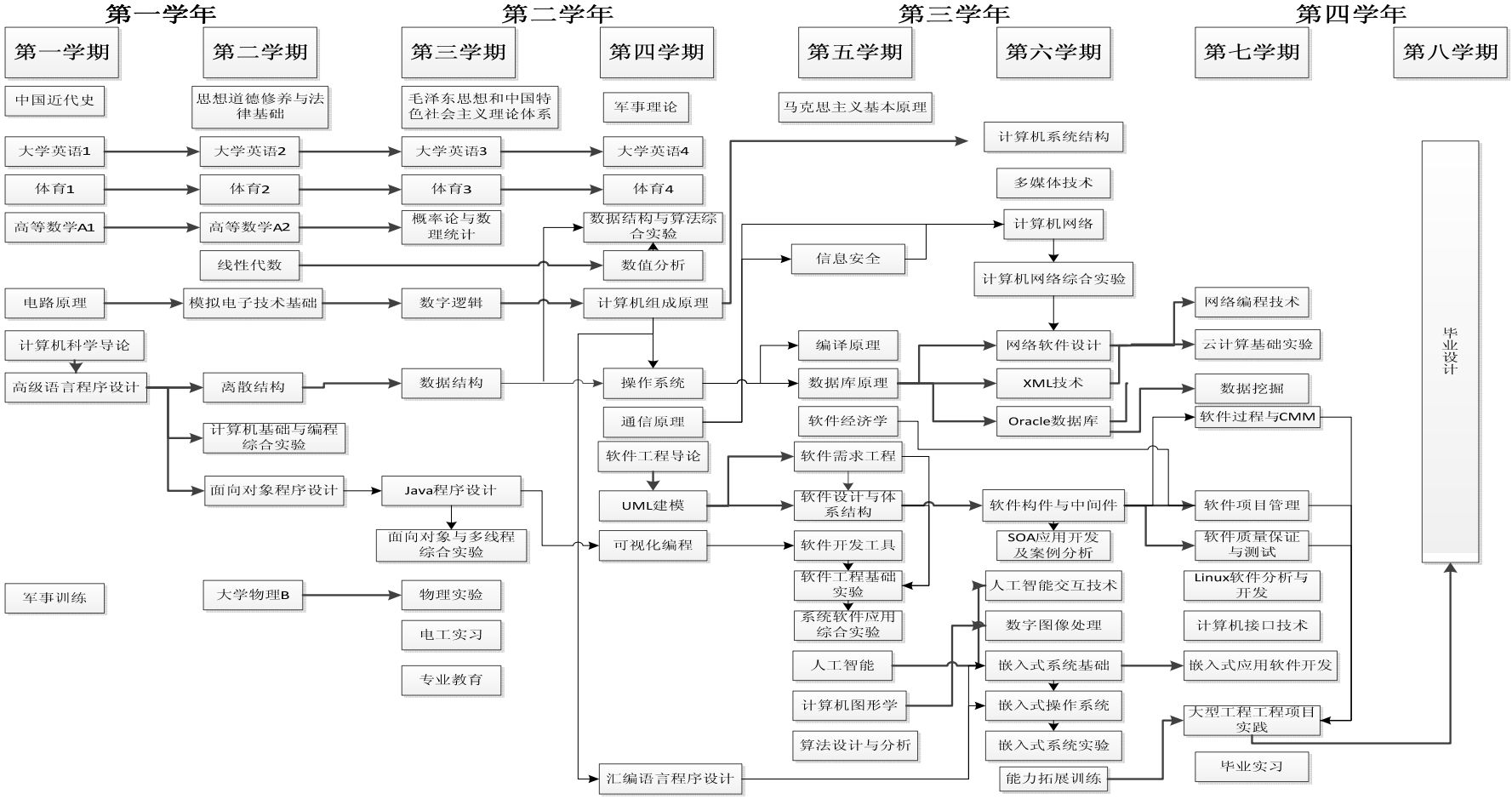
| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| | | 思想道德修养与法律基础 | | | | | | ✓ | ✓ | |
| | | 中国近现代史纲要 | | | | | | | ✓ | |
| | | 毛泽东思想和中国特色社会主义理论体系概论 | | | ✓ | | | | ✓ | |
| | | 马克思主义基本原理 | | | ✓ | | | ✓ | ✓ | |
| | | 军事理论 | | | | | | ✓ | ✓ | |
| | | 体育 | | | | | | ✓ | | |
| | | 大学英语 | | | | | | | ✓ | ✓ |
| | | 高等数学 | ✓ | ✓ | ✓ | | | | | |
| | | 电路原理 | ✓ | ✓ | | | ✓ | | | |
| | | 大学物理 | ✓ | | ✓ | ✓ | ✓ | | | |
| | | 物理实验 | ✓ | | ✓ | ✓ | ✓ | | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | | 线性代数 | ✓ | ✓ | ✓ | ✓ | | | | |
| | | 概率论与数理统计 B | ✓ | ✓ | ✓ | ✓ | | | | |
| | | 模拟电子技术基础 C | ✓ | ✓ | | | ✓ | | | |
| | | 数字逻辑 | ✓ | ✓ | ✓ | | | | | |
| | | 计算机科学导论 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ✓ | | 高级语言程序设计 A | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 离散结构 | ✓ | ✓ | ✓ | | | | | ✓ |
| | | 计算机基础与编程综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 面向对象程序设计 C | ✓ | ✓ | ✓ | | | | | |
| | | 面向对象与多线程综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| ✓ | | 数据结构 A | ✓ | ✓ | ✓ | | | | | ✓ |
| | | JAVA 语言程序设计 B | ✓ | ✓ | ✓ | | | | | |
| | | 计算机数值分析 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 数据结构与算法综合实验 | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 计算机组成原理 B | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 软件工程导论 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ✓ | | 操作系统 | ✓ | ✓ | ✓ | | | | | |
| | | 数据库系统原理 | ✓ | ✓ | ✓ | | | | | |
| | | 编译原理 | ✓ | ✓ | ✓ | | | | | |
| | | 软件需求工程 B | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| ✓ | | 软件设计与体系结构 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | | 系统软件应用综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 软件工程基础实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| ✓ | | 计算机网络 B | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | | 软件构件与中间件技术 B | ✓ | ✓ | ✓ | | ✓ | | | |
| | | 计算机网络综合实验 | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| ✓ | | 软件项目管理 B | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| | | 软件质量保证与测试 B | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| ✓ | | 软件工程项目综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 可视化编程 | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 算法设计与分析 B | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 软件开发工具 | | ✓ | ✓ | | ✓ | ✓ | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | | 软件工程经济学 | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 多媒体技术 | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 计算机系统结构 B | | ✓ | ✓ | | | | | |
| | | 软件过程与 CMM | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| | | 通信原理 C | | ✓ | ✓ | | | | | |
| | | 信息安全 | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | ✓ | 网络软件系统设计技术 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | XML 技术 | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | | Oracle 数据库技术 | | ✓ | ✓ | ✓ | | ✓ | | |
| | | 网络软件编程技术 | | ✓ | ✓ | | ✓ | | | |
| | | SOA 应用开发及案例分析 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 计算机图形学基础 B | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 人工智能概论 | ✓ | ✓ | ✓ | | | | | |
| | ✓ | 人机智能交互技术 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 数据挖掘 C | | ✓ | ✓ | | ✓ | | | |
| | | 数字图像处理 B | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 云计算基础实验 | | ✓ | ✓ | | ✓ | | | |
| | | 汇编语言程序设计 | ✓ | ✓ | ✓ | | | | | |
| | | 嵌入式系统基础 | | ✓ | ✓ | | ✓ | | | |
| | | 嵌入式操作系统 | | ✓ | ✓ | | ✓ | | | |
| | | 嵌入式系统实验 | | ✓ | ✓ | | ✓ | | | |
| | ✓ | 嵌入式应用软件开发 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 计算机接口技术 | | ✓ | ✓ | | ✓ | | | |
| | | Linux 软件分析与开发 | | ✓ | ✓ | | ✓ | | | |
| | | 军事训练 | | | | | | ✓ | ✓ | |
| | | 专业教育 | | | | ✓ | ✓ | ✓ | ✓ | |
| | | 电工电子实习 A | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 能力拓展训练 | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 毕业实习 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 大型软件工程项目实践 B | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 毕业设计 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 三、课程教学进程图

## Ⅲ　Teaching Process Map



## 四、理论教学建议进程表

## Ⅳ Theory Course Schedule

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 通识课程 Public Basic Courses | 必修课 Required Courses | 4120027110 | 计算机科学导论 Introduction to Computer Science | 2.5 | 40 | 10 | | | | 1 | | |
| | | 4120020110 | 高级语言程序设计 A Foundation of Programming A | 4 | 64 | 16 | | | | 1 | | |
| | | 4220002110 | 中国近现代史纲要 Outline of Chinese Contemporary and Modern | 2 | 32 | | | | | 1-6 | | |
| | | 4220001110 | 思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law | 3 | 48 | | | 8 | | 1-6 | | |
| | | 4220003110 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 4 | 96 | | | 32 | | 1-6 | | |
| | | 4220005110 | 马克思主义基本原理 Marxism Philosophy | 3 | 48 | | | 8 | | 1-6 | | |
| | | 1060001110 | 军事理论 Military Theory | 2 | 32 | | | 16 | | 2-4 | | |
| | | 4210001110 | 体育 1 Physical Education Ⅰ | 1 | 32 | | | | | 1 | | |
| | | 4210002110 | 体育 2 Physical Education Ⅱ | 1 | 32 | | | | | 2 | 体育 1 | |
| | | 4210003110 | 体育 3 Physical Education Ⅲ | 1 | 32 | | | | | 3 | 体育 2 | |
| | | 4210004110 | 体育 4 Physical Education Ⅳ | 1 | 32 | | | | | 4 | 体育 3 | |
| | | 4030002110 | 大学英语 A1 College English A 1 | 3 | 64 | | | | 16 | 1 | | |
| | | 4030003110 | 大学英语 A2 College English A Ⅱ | 3 | 64 | | | | 16 | 2 | 大学英语 A1 | |
| | | 4030004110 | 大学英语 A3 College English A Ⅲ | 3 | 64 | | | | 16 | 3 | 大学英语 A2 | |
| | | 4030005110 | 大学英语 A4 College English A Ⅳ | 3 | 64 | | | | 16 | 4 | 大学英语 A3 | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 36.5 | 744 | 26 | | 64 | 64 | | | |
| | 选修课 Elective Courses | 创新创业类 Innovation and Entrepreneurship Courses | 全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。<br>All students are required to obtain at least 9 credits, and must select art courses from *Art and Physical Education Courses* to obtain at least 2 credits. Science and engineering students should select at least one course from *Arts and Social Science Courses* or *Economy and Management Courses*, and other students should select at least one course from *Science and Technology Courses*. | | | | | | | | | |
| | | 人文社科类 Arts and Social Science Courses | | | | | | | | | | |
| | | 经济管理类 Economics and Management Courses | | | | | | | | | | |
| | | 科学技术类 Science and Technology Courses | | | | | | | | | | |
| | | 艺术体育类 Art and Physical Education Courses | | | | | | | | | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| 学科大类课程 Basic Disciplinary Courses | 必修课 Required Courses | 4050063110 | 高等数学 A1<br>Advanced Mathematics A1 | 5 | 80 | | | | | 1 | | |
| | | 4050064110 | 高等数学 A2<br>Advanced Mathematics A2 | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4110019110 | 电路原理 B<br>Circuit Principle B | 4 | 64 | 16 | | | | 1 | | |
| | | 4050023110 | 大学物理<br>PhysicsB | 5 | 88 | | | | | 2 | | |
| | | 4050229110 | 线性代数<br>Linear Algebra | 2.5 | 40 | | | | | 2 | | |
| | | 4120045110 | 离散结构<br>Discrete Structures | 4 | 64 | | | | | 2 | | |
| | | 4050058110 | 概率论与数理统计 B<br>Probability and Mathematics Statistic B | 3 | 48 | | | | | 3 | | |
| | | 4110050110 | 模拟电子技术基础 C<br>Analog Electronic Techniques C | 3 | 48 | 8 | | | | 3 | 电路原理 B | |
| | | 4050224110 | 物理实验<br>Physics Lab. | 1 | 32 | 32 | | | | 3 | | |
| | | 4120079110 | 数字逻辑<br>Digital Circuits | 3 | 48 | 8 | | | | 3 | 电路原理 B | |
| | | 4120264140 | 数据结构<br>Data Structures | 4 | 64 | | 16 | | | 3 | 高级语言程序设计 A | |
| | | 4120261140 | 计算机基础与编程综合实验<br>Experiments on Computer and Programming | 1 | 32 | 32 | | | | 2 | | |
| | | 4120048110 | 面向对象程序设计 C<br>Object-oriented methodology C | 2.5 | 40 | | 12 | | | 2 | 高级语言程序设计 A | |
| | | 4120263140 | 面向对象与多线程综合实验<br>Experiments on Object-oriented and Multithreading Programming | 1 | 32 | 32 | | | | 3 | | |
| | | 4120299140 | JAVA 语言程序设计 B<br>Java Programming B | 2.5 | 48 | | 8 | | | 3 | 高级语言程序设计 A | |
| | | 小 计 Subtotal | | 46.5 | 808 | 128 | 36 | | | | | |
| 专业课程 Specialized Course | 必修课 Required Courses | 4120028110 | 计算机数值分析<br>Computer Numerical Analysis B | 2.5 | 40 | | 8 | | | 4 | 线性代数 | |
| | | 4120265140 | 数据结构与算法综合实验<br>Experiments on Data Structure and Algorithms | 1 | 32 | 32 | | | | 4 | | |
| | | 4120083110 | 计算机组成原理 B<br>Computer Organization B | 4 | 64 | 10 | | 8 | | 4 | 数字逻辑 | |
| | | 4120062110 | 软件工程导论<br>Introduction to Software Engineering | 2.5 | 40 | | | | | 4 | 面向对象程序设计 C | |
| | | 4120272141 | 操作系统<br>Operating System | 4 | 64 | | 12 | 8 | | 5 | | |
| | | 4120273141 | 数据库系统原理<br>Principles of Database Systems | 3 | 48 | | | | | 5 | 操作系统 | |
| | | 4120011110 | 编译原理<br>Principles of Compiler | 3.5 | 56 | | 8 | | | 5 | | |
| | | 4120175120 | 软件设计与体系结构<br>Software Design and Architecture | 2 | 32 | 8 | | | | 5 | 软件工程导论 | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| | | 4120071110 | 软件需求工程 B<br>Software Requirements Engineering B | 2 | 32 | 8 | | | | 5 | 软件工程导论 | |
| | | 4120274141 | 系统软件应用综合实验<br>Experiments on Application Software | 1 | 32 | 32 | | | | 5 | | |
| | | 4120275141 | 软件工程基础实验<br>Primary Experiments on Software Engineering | 1 | 32 | 32 | | | | 5 | | |
| | | 4120034110 | 计算机网络 B<br>Computer Networks B | 2.5 | 40 | | | | | 6 | | |
| | | 4120063110 | 软件构件与中间件技术 B<br>Software Components and Middleware B | 2. | 32 | 8 | | | | 6 | JAVA 语言程序设计 B | |
| | | 4120271141 | 计算机网络综合实验<br>Experiments on Computer Networks | 1 | 32 | 32 | | | | 6 | | |
| | | 4120069110 | 软件项目管理 B<br>Software Project Management B | 2 | 32 | 6 | | | | 7 | 软件工程导论 | |
| | | 4120058110 | 软件质量保证与测试 B<br>Software Quality and Testing B | 2 | 32 | 8 | | | | 7 | 软件工程导论 | |
| | | 4120276141 | 软件工程项目综合实验<br>Senior Experiments on Software Engineering | 1 | 32 | 32 | | | | 7 | | |
| | | 小 计 Subtotal | | 37 | 672 | 206 | | 16 | | | | |
| | 选修课 Elective Courses | 模块 0(软件基础工具)<br>Module 0(Software Tools) | | | | | | | | | | |
| | | 4120044110 | 可视化编程<br>Visual Programming | 2.5 | 40 | | 10 | | | 4 | 面向对象程序设计 C | |
| | | 4120082110 | 算法设计与分析 B<br>Algorithm Design and Analysis B | 2 | 32 | | 6 | | | 4 | 数字图像处理 B | |
| | | 4120065110 | 软件开发工具<br>Software Development Tools | 2 | 32 | 16 | | | | 5 | JAVA 语言程序设计 B | |
| | | 4120150110 | 软件工程经济学<br>Economics of Software Engineering | 1 | 16 | | | | | 5 | 计算机科学导论 | |
| | | 4120040110 | 计算机系统结构 B<br>Computer Architecture B | 2 | 32 | | | | | 5 | 计算机组成原理 B | |
| | | 4120018110 | 多媒体技术<br>Multimedia Technique | 2 | 32 | 8 | | | | 6 | | |
| | | 4120064110 | 软件过程与 CMM<br>Software Process & CMM | 2 | 32 | 8 | | | | 7 | 软件工程导论 | |
| | | 小 计 Subtotal | | 13.5 | 216 | 32 | 16 | | | | | |
| | | 模块 1(网络软件)<br>Module I (Network Software) | | | | | | | | | | |
| | | 4120084110 | 通信原理 C<br>Principles of Communication C | 2.5 | 40 | 8 | | | | 4 | 数字逻辑 | |
| | | 4120102110 | 信息安全<br>Introduction to Computer Security | 2 | 32 | 8 | | | | 5 | 计算机网络 B | |
| | | 4120089110 | 网络软件系统设计技术<br>Network Software System Design | 2 | 32 | 12 | | | | 6 | 计算机网络 B | |
| | | 4120010110 | XML 技术<br>XML Technology | 2 | 32 | 8 | | | | 6 | 计算机网络 B | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4120005110 | Oracle 数据库技术<br>Oracle Database | 2 | 32 | 8 | | | | 6 | 数据库系统原理 | |
| | | 4120277141 | SOA 应用开发及案例分析<br>SOA Application and Case Study | 2 | 32 | 8 | | | | 6 | 计算机网络 B | |
| | | 4120088110 | 网络软件编程技术<br>Network Software Programming | 2.5 | 40 | 12 | | | | 7 | JAVA 语言程序设计 B | |
| | | 小 计 Subtotal | | 15 | 240 | 64 | | | | | | |
| | | 模块 2(智能系统软件)<br>Module II (Intelligent System Software) | | | | | | | | | | |
| | | 4120031110 | 计算机图形学基础 B<br>Foundation of Computer Graphics | 2 | 32 | 8 | | | | 4 | | |
| | | 4120055110 | 人工智能概论<br>Introduction to Artificial Intelligence | 2 | 32 | | | | | 5 | 离散结构 | |
| | | 4120056110 | 人机智能交互技术<br>Human-Computer Intelligent Interaction | 2 | 32 | 8 | | | | 6 | | |
| | | 4120078110 | 数据挖掘 C<br>Data Mining C | 2 | 32 | | 8 | | | 6 | 人工智能概论 | |
| | | 4120080110 | 数字图像处理 B<br>Digital Image Processing B | 2 | 32 | 8 | | | | 7 | 人工智能概论 | |
| | | 4120278141 | 云计算基础实验<br>Experiments on Cloud Computing | 1 | 32 | 32 | | | | 7 | 人工智能概论 | |
| | | 小 计 Subtotal | | 11 | 192 | 56 | 8 | | | | | |
| | | 模块 3(嵌入式软件)<br>Module III (Embedded Software) | | | | | | | | | | |
| | | 4120022110 | 汇编语言程序设计<br>Assembly Language Programming | 2.5 | 40 | 16 | | | | 4 | 高级语言程序设计 A | |
| | | 4120050110 | 嵌入式系统基础<br>Embedded System | 2 | 32 | 8 | | | | 5 | 计算机组成原理 B | |
| | | 4120049110 | 嵌入式操作系统<br>Embedded Operating System | 2 | 32 | 8 | | | | 6 | 操作系统 | |
| | | 4120279141 | 嵌入式系统实验<br>Experiments on Embedded System | 1 | 32 | 32 | | | | 6 | 嵌入式系统基础 | |
| | | 4120054110 | 嵌入式应用软件开发<br>Embedded Application Development | 2 | 32 | 8 | | | | 7 | 嵌入式操作系统 | |
| | | 4120026110 | 计算机接口技术<br>Computer Interface Techniques | 2 | 32 | 8 | | | | 7 | 汇编语言程序设计 | |
| | | 4120004110 | Linux 软件分析与开发<br>Software Development on Linux | 2 | 32 | 8 | | | | 7 | 操作系统 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 13.5 | 232 | 88 | | | | | | |
| | | 修读说明：推荐选模块 0+模块 i, (i=1,2 或 3)，要求最少选修 19.5 学分。<br>NOTE: recommend the selection of module 0 + module I (i=1,2 or 3) and require 19.5 of minimum subtotal credits. | | | | | | | | | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| 个性课程 Personalized Course | 选修课 Elective Courses | 4120247120 | 大数据技术与应用 Technology and Application of Large Data | 2 | 32 | | | | | 6 | | |
| | | 4120238120 | 解决问题的思维与策略 Thinking and Problem Solving Strategies | 2 | 32 | | | | | 5 | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 4 | 64 | | | | | | | |
| | | 修读说明：学生可跨专业自主选择修读全校其他专业的课程，要求至少选修 10 学分。<br>NOTE：Students can choose any courses from the other majors, and are especially suggested to choose the above courses . Minimum subtotal credits is 10. | | | | | | | | | | |

## 五、集中性实践教学环节

## Ⅴ Practice Schedule

| 课程编号 Course Number | 实践环节名称 Practice Course Name | 周数 Weeks | 学分 Crs | 建议修读学期 Suggested Term | 第二专业 Second Major |
|---|---|---|---|---|---|
| 1060002110 | 军事训练 Military Training | 3 | 1.5 | 1 | |
| 4120142110 | 专业教育 Introduction to Software Engineering Major | 1 | 1 | 3 | |
| 4100068110 | 电工电子实习 A Practice in Electrical Engineering & Electronics A | 2 | 2 | 3 | |
| 4120128110 | 能力拓展训练 Ability Development Training | 1 | 1 | 6（暑期） | |
| 4120114110 | 毕业实习 Graduation Practice | 3 | 3 | 7 | |
| 4120187120 | 大型软件工程项目实践 B Practice of Large-Scale Software Project B | 2 | 2 | 7 | |
| 4120110110 | 毕业设计 Bachelor Thesis | 17 | 11 | 8 | |
| 小 计 Subtotal | | 29 | 21.5 | | |

## 六、修读指导

## Ⅵ Recommendations on Course Studies

1. 本专业课程设置方法参考 IEEE2001 SE 推荐的计算机科学优先方法，并按照自底向上的方法展开的软件工程类课程的学习，课程启动策略为程序设计优先方式。

本专业重要的学科大类基础课程和专业课程有：计算机科学导论、高级语言程序设计、离散结构、数据结构、计算机组成原理、操作系统、编译原理、数据库系统原理、计算机网络、软件工程导论、软件需求工程、软件设计与体系结构、软件构件与中间件技术、软件项目管理、软件测试、UML 建模技术、软件开发工具、软件过程与 CMM。

2. 为体现本专业的专业特色与方向，本专业选修课程包括以下三个课群:

智能软件与系统课群：人工智能概论、数据挖掘、人机智能交互技术、自然语言处理、数字图象处理基础 C；

嵌入式软件与系统课群：嵌入式操作系统、计算机接口技术、嵌入式开发工具、嵌入式应用软件开发、Linux 软件分析与开发；

网络软件与系统课群：信息安全、网络软件系统设计技术、XML 技术、Oracle 数据库技术、网络系统集成与工程设计；

1. The SE major program refers to IEEE 2001 SE which gives priority to computer science discipline and is formulated according to the bottom-to-up study strategy and programming-oriented course starting strategy.

The discipline courses and major courses of SE are: Introduction to Computer Science, Advanced Language Programming, Discrete structure, Data Structure, Principles of Computer Organization, Operating System, Compiler Theory, Principles of Database Systems, Computer Network, Introduction to Software Engineering, Software Requirements Engineering, Software Design and Architecture, Software Components and Middleware Technology, Software Project Management, Software Requirements Engineering, Software Testing, UML Modelling, Software Development Tools, Software Process and CMM.

2. The featured study field and directions are show in three tracks including specialized elective courses:

Track 1- Intelligent Software and System:

Introduction to Artificial Intelligence, Data Ming, Human-Computer Intelligent Interaction, Natural Language Processing, Digital Image Processing C;

Track 2- Embedded Software and System:

Embedded Operating System, Computer Interface Techniques, Embedded Development Tools, Embedded Application Software Development, Software Development on Linux;

Track 3 -Network Software and System:

Computer Security, Network Software System Design, XML Technology, Oracle Database, Technology of Network System Integration & Engineering;

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：袁景凌

专业培养方案责任人：刘东飞

# 【物联网工程专业】2014 版本科培养方案
# Undergraduate Education Plan for Specialty in the Internet of Things Engineering (2014)

| | | | |
|---|---|---|---|
| 专业名称<br>Major | **物联网工程**<br>Internet of Things Engineering | 主干学科<br>Major Disciplines | **物联网工程**<br>Internet of Things Engineering |
| 计划学制<br>Duration | **四年**<br>4 Years | 授予学位<br>Degree Granted | **工学学士**<br>Bachelor of Engineering |
| 所属大类<br>Disciplinary | **计算机类**<br>Computer Science and technology | 大类培养年限<br>Duration | **1.5 年**<br>1.5 years |

**最低毕业学分规定**

**Graduation Credit Criteria**

| 课程类别<br>课程性质 | 通识课程<br>Public Basic Courses | 学科大类课程<br>Basic Disciplinary Courses | 专业课程<br>Specialized Courses | 个性课程<br>Personalized Course | 集中性实践<br>Practice Courses | 课外学分<br>Study Credit after Class | 总学分<br>Total Credits |
|---|---|---|---|---|---|---|---|
| 必修课<br>Required Courses | 36.5 | 46.5 | 38.5 | \ | 21.5 | \ | 190 |
| 选修课<br>Elective Courses | 9 | \ | 18 | 10 | \ | 10 | |

## 一、培养目标与毕业要求

## Ⅰ Educational Objectives &Requirement

### （一） 培养目标

（1） 具有良好道德与修养，在科学研究、工程开发、应用实现中遵守法律法规，社会和环境意识强，有能力服务社会；

（2） 具有坚实的数学基础、计算基础、工程社会经济基础和物联网工程基础，掌握与物联网工程相关的自然科学、人文社科基本知识和计算机科学基础理论；

（3） 系统地掌握物联网工程的基础理论和技术，具备运用先进的工程化方法、技术和工具从事物联网工程相关领域的系统分析与构思、设计与实现、管理与服务等多方面工作的能力；

（4） 具有口头和书面表达能力，并能在团队中有效发挥作用；

（5） 具备通过继续教育或其它的终身学习途径拓展自己的能力，紧跟学科和专业发展。

（1） Have good morals and self-cultivation, keep laws and regulations, and hold strong social consciousness and responsibility in research and development;

（2） Have the foundation of mathematics，Fundamentals of Computing, foundation of engineering and social economy, engineering foundation of Internet of things (IoT), master basic knowledge of natural, humanities and social science, and basic theory of computer science;

（3） Systematically master the basic theory and technology of the IoT engineering, have the ability of system analysis and conception, design and implementation, management and service in the field of IoT engineering with the advance engineering methods, technology and tools ;

（4） Have oral and written communication skills and be good at teamwork;

（5） Have the abilities in self-improving through continuing education and other education methods and keep up with the cutting edge development of IoT engineering.

**（二） 毕业要求**

（1） 掌握从事物联网工程专业工作所需的数学、自然科学知识以及一定的经济学与管理学知识；

（2） 掌握物联网工程专业基础理论与知识，了解专业的前沿发展现状和趋势；具有创新意识，并具有技术创新和产品创新的初步能力；

（3） 掌握物联网工程中的感知基础知识，学生能够运用相关技术完成感知层的基本设计和实现；

（4） 掌握物联网工程中的传输基础知识，学生具有物联网工程中的网络设计与开发等能力；

（5） 具有嵌入式系统分析与设计的能力；

（6） 具有物联网工程系统硬软件开发能力；

（7） 掌握物联网工程系统集成技术，具有综合应用知识解决物联网工程中实际问题的能力。

（8） 具有终身学习意识，能够运用现代信息技术获取相关信息和新技术、新知识，持续提高自己的能力；

（9） 了解与物联网工程专业相关的职业和行业的重要法律、法规及方针与政策，理解工程技术与信息技术应用相关的伦理基本要求，在系统设计过程中能够综合考虑经济、环境、法律、安全、健康、伦理等制约因素；

（10） 具有一定的组织管理能力、表达能力、独立工作能力、人际交往能力和团队合作能力；

（11） 具有初步的外语应用能力，能阅读软件工程及相关专业的外文材料，具有一定的国际视野和跨文化交流、竞争与合作能力。

（1） Master the knowledge of IoT engineering in mathematics, natural science, economics and management.

（2） Master the basic theoretical and professional knowledge of IoT engineering, know the state of the art and the trend of IoT engineering, have innovative consciousness and the preliminary ability of technical and products innovation.

（3） Master the basic knowledge of perception layer of IoT engineering, have the ability of basic design and implement of perception layer.

（4） Master the basic knowledge of transport layer of IoT engineering, have the ability of network design and development.

（5） Have the ability of analyses and design of embedded system.

（6） Have the ability of development of the hardware and software of IoT engineering.

（7） Master the integrated technology of IoT engineering, have the comprehensive ability of the applied knowledge to solve the practical problems.

（8） Have the ability in using information technology to obtain knowledge and new technology for self-improving with a lifelong learning attitude.

（9） Know the laws, rules and policies of IoT industry and business, the ethics of information engineering, the various factors in system design including economics, environment, laws, security, health and so forth.

（10） Have the ability in team management and collaboration, expression and interpersonal communication, and working independently.

（11） Have the ability in understanding and reading English literature of SE and related majors and have the international view of SE for cross-culture communication, competition and collaboration.

附：培养目标实现矩阵

| | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | ✓ | | | | |
| 毕业要求 2 | | ✓ | | | |
| 毕业要求 3 | | ✓ | | | |
| 毕业要求 4 | | ✓ | | | |
| 毕业要求 5 | | ✓ | | | |
| 毕业要求 6 | | ✓ | ✓ | | |
| 毕业要求 7 | | ✓ | ✓ | | |
| 毕业要求 8 | | | | | ✓ |
| 毕业要求 9 | ✓ | | ✓ | | |
| 毕业要求 10 | | | | ✓ | |
| 毕业要求 11 | | | | | ✓ |

## 二、专业核心课程与专业特色课程

## II Core Courses and **Characteristic Courses**

(一) 专业核心课程：

物联网工程概论、射频识别与传感器技术、无线传感器网络、嵌入式系统应用、智能终端操作系统与应用、云计算与服务计算、物联网应用系统开发等。

Core courses: Principles of IoT Engineering, RFID and Sensor Technology, Wireless Sensor Networks, Embedded System and Application, Intelligent Terminal OS and Application, Cloud & Service Computing, Practice of the Internet of Things Application.

(二) 专业特色课程：

物联网控制基础、嵌入式系统应用、无线传感器网络、物联网工程与组网技术、智能终端操作系统与应用、云计算与服务计算、物联网定位技术、物联网应用系统开发。

Characteristic Courses: IoT Control Theory Foundation, Embedded System and Application, Wireless Sensor Networks, IoT & Network Engineering, Intelligent Terminal OS and Application, Cloud & Service Computing, Technology of IoT Location, IoT Application System Development.

附：毕业要求实现矩阵：

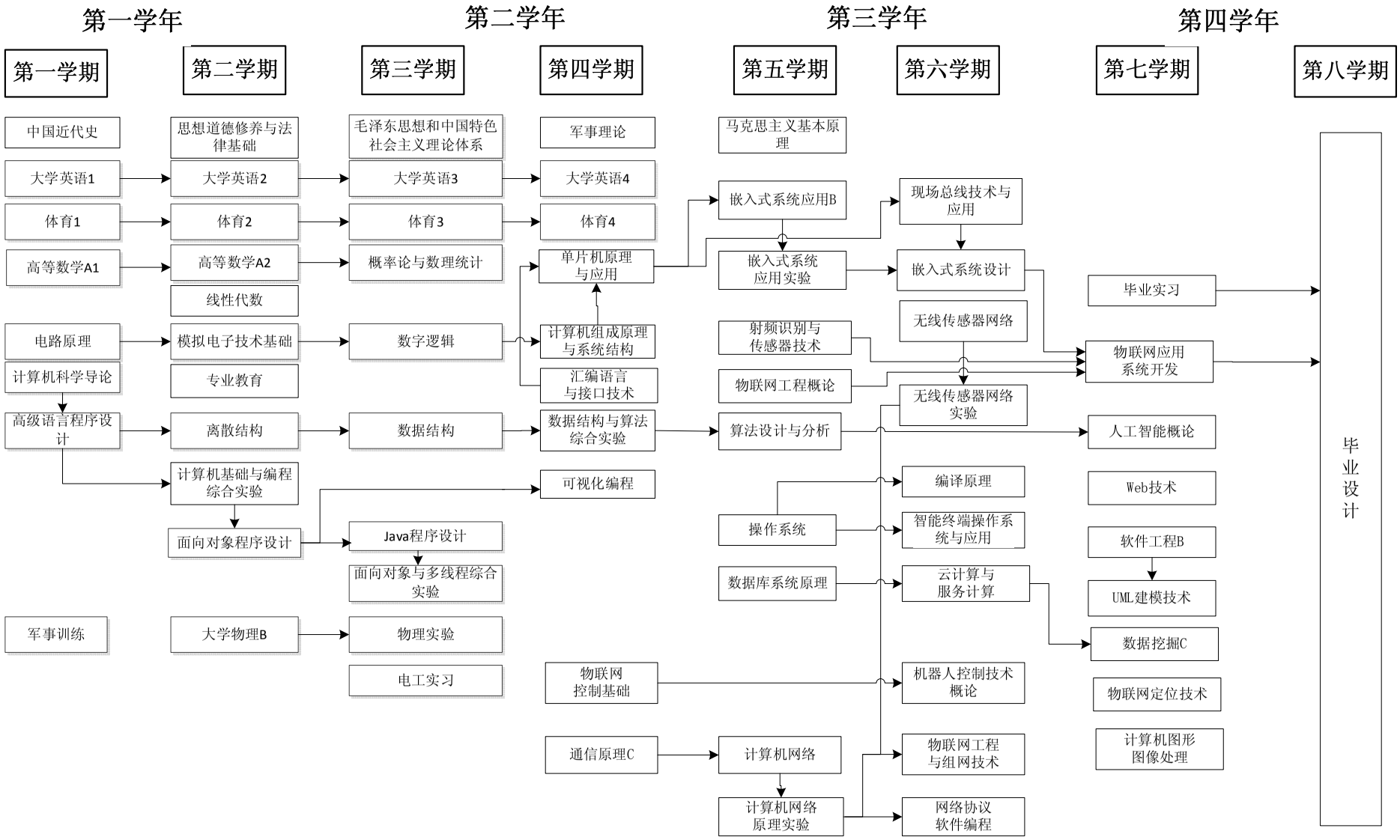
| **专业核心课程** | **专业特色课程** | **课程名称** | **物联网工程专业毕业要求** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| | | 思想道德修养与法律基础 | ✓ | | | | | | | | ✓ | ✓ | |
| | | 中国近现代史纲要 | ✓ | | | | | | | | ✓ | | |
| | | 毛泽东思想和中国特色社会主义理论体系概论 | ✓ | | | | | | | | ·✓ | | |
| | | 马克思主义基本原理 | ✓ | | | | | | | | ✓ | | |
| | | 军事理论 | ✓ | | | | | | | | ✓ | | |
| | | 体育 | ✓ | | | | | | | | ✓ | | |
| | | 大学英语 | ✓ | | | | | | | | | | ✓ |
| | | 计算机科学导论 | | ✓ | | | | | | ✓ | | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 物联网工程专业毕业要求 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） | （9） | （10） | （11） |
| | | 高级语言程序设计 A | | ✓ | | | | | | | | | |
| | | 高等数学 | ✓ | | | | | | | | | | |
| | | 线性代数 | ✓ | | | | | | | | | | |
| | | 概率论与数理统计 B | ✓ | | | | | | | | | | |
| | | 大学物理 | ✓ | | | | | | | | | | |
| | | 物理实验 | ✓ | | | | | | | | | | |
| | | 电路原理 | ✓ | | | | ✓ | ✓ | | | | | |
| | | 离散结构 | | ✓ | | | | | | | | | |
| | | 模拟电子技术基础 | | ✓ | | | ✓ | ✓ | | | | | |
| | | 数字逻辑 | | ✓ | | | ✓ | ✓ | | | | | |
| | | 面向对象程序设计 | | ✓ | | | | | | | | | |
| | | 数据结构 | | ✓ | | | | | | | | | |
| | | JAVA 语言程序设计 | | ✓ | | | | | | | | | |
| | | 计算机基础与编程综合实验 | | ✓ | | | | | | | | | |
| | | 面向对象与多线程综合实验 | | ✓ | | | | | | | | | |
| | | 计算机组成与系统结构 | | ✓ | | | | ✓ | | | | | |
| | | 汇编语言与接口技术 | | ✓ | | | | ✓ | | | | | |
| | | 计算机网络 B | | ✓ | | ✓ | | | | | | | |
| ✓ | | 射频识别与传感器技术 | | ✓ | ✓ | | | | | | | | |
| ✓ | ✓ | 嵌入式系统应用 B | | | | | ✓ | | | | | | |
| | | 嵌入式系统应用 B 实验 | | | | | ✓ | | | | | | |
| | | 操作系统 | | ✓ | | | | | | | | | |
| ✓ | ✓ | 无线传感器网络 | | | ✓ | ✓ | | | | | | | |
| | | 数据库系统原理 | | ✓ | | | | | | | | | |
| ✓ | | 物联网工程概论 | | ✓ | | | | | | ✓ | | | |
| | | 数据结构与算法综合实验 | | ✓ | | | | | | | | | |
| | | 计算机网络原理实验 | | | | ✓ | | | | | | | |
| | | 网络协议软件编程 | | | | ✓ | | | | | | | |
| | | 无线传感器网络实验 | | | ✓ | ✓ | | | | | | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 物联网工程专业毕业要求 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） | （9） | （10） | （11） |
| ✓ | ✓ | 云计算与服务计算 | | | ✓ | | | | | | | | |
| ✓ | ✓ | 智能终端操作系统与应用 | | | | | ✓ | ✓ | | | | | |
| ✓ | ✓ | 物联网应用系统开发 | | | | | | | ✓ | | | ✓ | |
| | | 可视化编程 | | | | | | ✓ | | | | | |
| | | 算法设计与分析 A | | | | | | ✓ | | | | | |
| | | 编译原理 | | | | | | ✓ | | | | | |
| | | 软件工程 B | | | | | | ✓ | ✓ | | | | |
| | | Web 技术 | | | | | | ✓ | | | | | |
| | | 人工智能概论 | | ✓ | | | | | | | | | |
| | | UML 建模技术 | | | | | | ✓ | | | | | |
| | | 数据挖掘 C | | ✓ | | | | ✓ | | | | | |
| | | 通信原理 C | | | | ✓ | | | | | | | |
| | ✓ | 物联网控制基础 | | ✓ | ✓ | | | | | | | | |
| | | 单片机原理与应用 | | | | | ✓ | | | | | | |
| | | 信号处理原理 | | | ✓ | | | | | | | | |
| | | 现场总线技术与应用 | | | | ✓ | ✓ | | | | | | |
| | ✓ | 物联网工程与组网技术 | | | | ✓ | | | | | | | |
| | | 机器人控制技术概论 | | | ✓ | | | | | | | | |
| | ✓ | 物联网定位技术 | | | ✓ | | | | | | | | |
| | | 计算机图形图像处理 | | | | | | ✓ | | | | | |
| | | 军事训练 | | | | | | | | | | ✓ | |
| | | 专业教育 | | ✓ | | | | | | ✓ | | | |
| | | 电工电子实习 A | ✓ | | | | | | | | | | |
| | | 嵌入式系统设计 | | | | | | | ✓ | | | ✓ | |
| | | 毕业实习 | | | | | | | | | ✓ | ✓ | |
| | | 毕业设计 | | | | | | | ✓ | | | ✓ | |

## 三、课程教学进程图

## Ⅲ　Teaching Process Map


第一学年
第二学年
第三学年
第四学年
第一学期
第二学期
第三学期
第四学期
第五学期
第六学期
第七学期
第八学期
中国近代史
思想道德修养与法律基础
毛泽东思想和中国特色社会主义理论体系
军事理论
马克思主义基本原理
大学英语1
大学英语2
大学英语3
大学英语4
体育1
体育2
体育3
体育4
高等数学A1
高等数学A2
概率论与数理统计
单片机原理与应用
嵌入式系统应用B
现场总线技术与应用
嵌入式系统应用实验
嵌入式系统设计
线性代数
毕业实习
无线传感器网络
电路原理
模拟电子技术基础
数字逻辑
计算机组成原理与系统结构
射频识别与传感器技术
物联网应用系统开发
计算机科学导论
专业教育
汇编语言与接口技术
物联网工程概论
无线传感器网络实验
高级语言程序设计
离散结构
数据结构
数据结构与算法综合实验
算法设计与分析
人工智能概论
计算机基础与编程综合实验
可视化编程
编译原理
Web技术
操作系统
智能终端操作系统与应用
面向对象程序设计
Java程序设计
软件工程B
面向对象与多线程综合实验
数据库系统原理
云计算与服务计算
UML建模技术
军事训练
大学物理B
物理实验
数据挖掘C
电工实习
物联网控制基础
机器人控制技术概论
物联网定位技术
通信原理C
计算机网络
物联网工程与组网技术
计算机图形图像处理
计算机网络原理实验
网络协议软件编程
毕业设计

## 四、理论教学建议进程表

## Ⅳ Theory Course Schedule

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 通识课程 Public Basic Courses | 必修课 Required Courses | 4220001111 | 思想道德修养与法律基础<br>Morals, Ethics and Fundamentals of Law | 3 | 48 | | | 8 | | 1-6 | | |
| | | 4220002111 | 中国近现代史纲要<br>Outline of Contemporary and Modern Chinese | 2 | 32 | | | | | 1-6 | | |
| | | 4120027111 | 计算机科学导论<br>Introduction to Computer Science | 2.5 | 40 | 10 | | | | 1 | | |
| | | 4120020111 | 高级语言程序设计 A<br>Advanced Language Programming A | 4 | 64 | 16 | | | | 1 | | |
| | | 4220003111 | 毛泽东思想和中国特色社会主义理论体系概论<br>Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 4 | 96 | | | 32 | | 1-6 | | |
| | | 4220005111 | 马克思主义基本原理<br>Marxism Philosophy | 3 | 48 | | | 8 | | 1-6 | | |
| | | 1060001111 | 军事理论<br>Military Theory | 1 | 32 | | | 16 | | 2-4 | | |
| | | 1050001131 | 心理健康教育<br>Mental Health Education | 1 | 16 | | | | | 1-2 | | |
| | | 4210001111 | 体育 1<br>Physical Education Ⅰ | 1 | 32 | | | | | 1 | | |
| | | 4210002111 | 体育 2<br>Physical Education Ⅱ | 1 | 32 | | | | | 2 | 体育 1 | |
| | | 4210003111 | 体育 3<br>Physical Education Ⅲ | 1 | 32 | | | | | 3 | 体育 2 | |
| | | 4210004111 | 体育 4<br>Physical Education Ⅳ | 1 | 32 | | | | | 4 | 体育 3 | |
| | | 4030002111 | 大学英语 A1<br>College English A 1 | 3 | 64 | | | | 16 | 1 | | |
| | | 4030003111 | 大学英语 A2<br>College English A Ⅱ | 3 | 64 | | | | 16 | 2 | 大学英语 A1 | |
| | | 4030004111 | 大学英语 A3<br>College English A Ⅲ | 3 | 64 | | | | 16 | 3 | 大学英语 A2 | |
| | | 4030005111 | 大学英语 A4<br>College English A Ⅳ | 3 | 64 | | | | 16 | 4 | 大学英语 A3 | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 36.5 | 744 | 26 | | 64 | 64 | | | |
| | 选修课 Elective Courses | 创新创业类<br>Innovation and Entrepreneurship Courses | 全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。<br>All students are required to obtain at least 9 credits, and must select art courses from *Art and Physical Education Courses* to obtain at least 2 credits. Science and engineering students should select at least one course from *Arts and Social Science Courses* or *Economy and Management Courses*, and other students should select at least one course from *Science and Technology Courses*. | | | | | | | | | |
| | | 人文社科类<br>Arts and Social Science Courses | | | | | | | | | | |
| | | 经济管理类<br>Economics and Management Courses | | | | | | | | | | |
| | | 科学技术类<br>Science and Technology Courses | | | | | | | | | | |
| | | 艺术体育类<br>Art and Physical Education Courses | | | | | | | | | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | | |
| 学科大类课程 Basic Disciplinary Courses | 必修课 Required Courses | 4050063111 | 高等数学 A1<br>Advanced Mathematics AⅠ | 5 | 80 | | | | | 1 | | |
| | | 4050064111 | 高等数学 A2<br>Advanced Mathematics AⅡ | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4110019111 | 电路原理 B<br>Circuit Principle B | 4 | 64 | 16 | | | | 1 | | |
| | | 4050229111 | 线性代数<br>Linear Algebra | 2.5 | 40 | | | | | 2 | | |
| | | 4050463131 | 大学物理<br>Physics | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4050224111 | 物理实验 B<br>Physics Lab. B | 1 | 32 | 32 | | | | 3 | 大学物理 B | |
| | | 4120045111 | 离散结构<br>Discrete Structures | 4 | 64 | | | | | 2 | 计算机科学导论 | |
| | | 4120261141 | 计算机基础与编程综合实验<br>Experiments on Computer and Programming | 1 | 32 | 32 | | | | 2 | | |
| | | 4120048111 | 面向对象程序设计 C<br>Object-oriented Methodology | 2.5 | 40 | 12 | | | | 2 | 高级语言程序设计 A | |
| | | 4120263141 | 面向对象与多线程综合实验<br>Experiments on Object-oriented and Multithreading Programming | 1 | 32 | 32 | | | | 3 | | |
| | | 41200791111 | 数字逻辑<br>Digital Circuits | 3 | 48 | 8 | | | | 3 | 模拟电子技术基础 C | |
| | | 4050058111 | 概率论与数理统计 B<br>Probability and Mathematics Statistic B | 3 | 48 | | | | | 3 | 高等数学 A2 | |
| | | 4110050111 | 模拟电子技术基础 C<br>Analog Electronic Techniques C | 3 | 48 | 8 | | | | 3 | 高等数学 A2 | |
| | | 4120264141 | 数据结构 A<br>Data Structures A | 4 | 64 | 12 | | | | 3 | 高级语言程序设计 A | |
| | | 4120299141 | JAVA 语言程序设计 B<br>Java Programming B | 2.5 | 40 | | 8 | | | 3 | 高级语言程序设计 A | |
| | | 小 计 Subtotal | | 46.5 | 792 | 160 | | | | | | |
| 专业课程 Specialized Course | 必修课 Required Courses | 4120265140 | 数据结构与算法综合实验<br>Experiments on Data Structure and Algorithm | 1 | 32 | 32 | | | | 4 | | |
| | | 4120041111 | 计算机组成与系统结构<br>Computer Organization and Architecture | 4.5 | 72 | 10 | | | | 4 | 数字逻辑 | |
| | | 4120015111 | 汇编语言与接口技术<br>Assembly Language Programming and Interface | 3 | 48 | 16 | | | | 4 | 计算机组成与系统结构 | |
| | | 4120014111 | 操作系统<br>Principles of Operating System | 3.5 | 56 | 12 | | | | 5 | | |
| | | 4120033111 | 计算机网络 B<br>Computer Networks B | 2 | 32 | | | | | 5 | | |
| | | 4120038111 | 计算机网络原理实验<br>Computer Networks and Communications | 1 | 32 | 32 | | | | 5 | 计算机网络 B | |
| | | 4120072111 | 射频识别与传感器技术<br>RFID and Sensor Technology | 3.5 | 56 | 12 | | | | 5 | 模拟电子技术基础 C | |
| | | 4120053111 | 嵌入式系统应用 B<br>Embedded System and Application B | 2 | 32 | | | | | 5 | | |
| | | 4120051111 | 嵌入式系统应用实验<br>Embedded System and Application Experiment | 1 | 32 | 32 | | | | 5 | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | | |
| | | 4120077111 | 数据库系统原理<br>Principles of Database Systems | 3 | 48 | 8 | | | | 5 | | |
| | | 4120067111 | 物联网工程概论<br>Principles of the IoT Engineering | 2 | 32 | | | | | 5 | 物联网控制基础 | |
| | | 4120007111 | 网络协议软件编程<br>Programming of network protocol | 2.5 | 40 | 8 | | | | 6 | 计算机网络 B | |
| | | 4120095111 | 无线传感器网络<br>Wireless Sensor Network | 2 | 32 | | | | | 6 | | |
| | | 4120297141 | 无线传感器网络实验<br>Wireless Sensor Network experiments | 1 | 32 | 32 | | | | 6 | 射频识别与传感器技术 | |
| | | 4120083111 | 云计算与服务计算<br>Cloud & Service Computing | 2 | 32 | 6 | | | | 6 | | |
| | | 4120096111 | 智能终端操作系统与应用<br>Intelligent Terminal OS and Application | 2.5 | 40 | | | 16 | | 6 | JAVA 语言程序设计 B | |
| | | 4120180121 | 物联网应用系统开发<br>the IoT Application System development | 3 | 64 | | | 64 | | 7 | | |
| | | 小 计 Subtotal | | 39.5 | 712 | 156 | | 80 | | | | |
| | 选修课 Elective Courses | 方向一：物联网软件方向<br>direction 1: Software of IOT | | | | | | | | | | |
| | | 4120044111 | 可视化编程<br>Visual Programming | 2.5 | 40 | 10 | | | | 4 | | |
| | | 4120081111 | 算法设计与分析 A<br>Algorithm Design and Analysis A | 2.5 | 40 | | 8 | | | 5 | 数据结构 A | |
| | | 4120011111 | 编译原理<br>Principles of Compiler Construction | 3.5 | 56 | | 8 | | | 6 | | |
| | | 4120060111 | 软件工程 B<br>Software Engineering B | 2.5 | 40 | | 8 | | | 7 | | |
| | | 4120009111 | Web 技术<br>Web Technology | 2 | 32 | | 6 | | | 7 | | |
| | | 4120055111 | 人工智能概论<br>Introduction to Artificial Intelligence | 2 | 32 | | | | | 7 | | |
| | | 4120008111 | UML 建模技术<br>UML Modeling Technology | 2 | 32 | 8 | | | | 7 | | |
| | | 4120078111 | 数据挖掘 C<br>Data Mining C | 2 | 32 | | 8 | | | 7 | | |
| | | 小 计 Subtotal | | 19 | 304 | 18 | 38 | | | | | |
| | | 方向二：物联网感知与控制方向<br>Direction2: perception and control of IOT | | | | | | | | | | |
| | | 4120084111 | 通信原理 C<br>Communication Principles C | 2.5 | 40 | 8 | | | | 4 | | |
| | | 4120012111 | 物联网控制基础<br>IoT Control Theory Foundation | 2.5 | 40 | | | | | 4 | 数字逻辑 | |
| | | 4120298141 | 单片机原理与应用<br>Controller Pprinciples and Application | 2 | 32 | 10 | | | | 4 | | |
| | | 4120001111 | 现场总线技术与应用<br>Field Bus Technology and Application | 2.5 | 40 | 12 | | | | 6 | 计算机组成与系统结构 | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4120098111 | 物联网工程与组网技术<br>IoT & Network Engineering | 2 | 32 | 8 | | | | 6 | 无线传感器网络<br>射频识别与传感器技术 | |
| | | 4120201131 | 机器人控制技术概论<br>Principles of Robot Control Technology | 2 | 32 | | | | | 6 | 射频识别与传感器技术<br>嵌入式系统应用 B | |
| | | 4120099111 | 物联网定位技术<br>Technology of IoT Location | 2.5 | 40 | 8 | | | | 7 | | |
| | | 4120029111 | 计算机图形图像处理<br>Computer Graphics and Image Processing | 2 | 32 | 6 | | | | 7 | | |
| | | 小 计 Subtotal | | 18 | 328 | 52 | | | | | | |
| | | 修读说明：要求至少选修 18 学分（要求方向一选择 9 学分，方向二选择 9 学分）。<br>NOTE: Subtotal credits at least:18( Everyone select at least 9 credits on direction1 and at least 9 credits on direction 2 ) | | | | | | | | | | |
| 个性课程 Personalized Course | 选修课 Elective Courses | 4120237121 | 计算机科学与经济学<br>Computer Science and Economics | 2 | 32 | | | | | 5 | | |
| | | 4120244121 | 大数据分析技术<br>Data Analysis Technology | 2.5 | 40 | 8 | | | | 6 | | |
| | | 4120245121 | 信息系统分析与设计<br>Analysis and Design of Information | 2 | 32 | 6 | | | | 6 | | |
| | | 4120246121 | 计算机与信息安全<br>Computer and Information Security | 2 | 32 | | | | | 6 | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 8.5 | 136 | 14 | | | | | | |
| | | 修读说明：学生可跨专业自主选择修读全校其他专业的课程，建议修读以上课程。要求至少选修 10 学分。<br>NOTE：Students can choose any courses from the other specialties, and are especially suggested to choose the courses above. Minimum subtotal credits: 10. | | | | | | | | | | |

## 五、集中性实践教学环节建议进程表

## Ⅴ Practice Schedule

| 课程编号 Course Number | 实践环节名称 Practice Courses Name | 周数 Weeks | 学分 Crs | 建议修读学期 Suggested Term | 第二专业 Second Major |
|---|---|---|---|---|---|
| 1060002111 | 军事训练<br>Military Training | 3 | 1.5 | 1 | |
| 4120143111 | 专业教育<br>Professional Education | 1 | 1 | 3 | |
| 4100068111 | 电工电子实习 A<br>Practice in Electrical Engineering & Electronics A | 2 | 2 | 3 | |
| 4120131111 | 嵌入式系统设计<br>Embedded System Design | 3 | 3 | 6 | |
| 4120113111 | 毕业实习<br>Practice for Graduation | 3 | 3 | 7 | |
| 4120109111 | 毕业设计<br>Graduation Design | 17 | 11 | 8 | |
| 小 计 Subtotal | | 29 | 21.5 | | |

## 六、课程修读指导建议

## Ⅵ Recommendations on Course Studies

本专业最重要的核心课程为 12 门专业课程，以及 3 门专业实验课程和 1 门专业实践课程，学生在修读时应加以重点关注。

这 12 门课程是：计算机组成与系统结构、汇编语言与接口技术、计算机网络 B、射频识别与传感器技术、嵌入式系统应用 B、操作系统、无线传感器网络、数据库系统原理、物联网工程概论、云计算与服务计算、智能终端操作系统与应用、网络协议软件编程。3 门专业实验课程：嵌入式系统应用 B 实验、计算机网络原理实验、无线传感器网络实验。1 门专业实践课程为：物联网应用系统开发。

为体现本专业的专业方向，本专业课程包括了以下两个课程方向：

1. 物联网软件方向

主要组成课程：可视化编程、算法设计与分析 A、软件工程 B、编译原理、Web 技术、计算机图形图像处理、人工智能概论、UML 建模技术、数据挖掘 C。

2. 物联网感知与控制方向

主要组成课程：通信原理 C、物联网控制基础、单片机原理与应用、现场总线技术与应用、机器人控制技术概论、物联网工程与组网技术、物联网定位技术、计算机图形图像处理。

在选取选修课程时，需要在两个方向上都选取课程，要求方向一选择 8 学分，方向二选择 9 学分。

The most important core courses are consisted of 12 specialized courses, 3 experimental courses, and 1 practical course. Please focus on studying those curriculums.

12 specialized courses are: Computer Organization and Architecture, Assembly Language Programming and Interface Technology, Computer Networks B, RFID and Sensor Technology, Embedded System and Application, Principles of Operating System, Wireless Sensor Network, Principles of Database Systems, Principles of the Internet of Things Engineering, Cloud & Service Computing, The Internet of Things Applications Integrated Design, Programming of network protocol. 3 experimental courses are: Computer Networks and Communications experiment, Embedded System and Application Experiment, Wireless Sensor Network experiments. 1 practical course is the IoT Application System development.

The featured study field and directions are show in two tracks including specialized elective courses:

Track 1- Software of IOT: Visual Programming, Algorithm Design and Analysis A, Principles of Compiler Construction, Software Engineering B, Web Technology, Introduction to Artificial Intelligence, UML Modeling Technology, Data Mining C

Track 2- perception and control of IOT: Communication Principles C, IoT Control Theory Foundation, Controller principles and application, Field Bus Technology and Application, Internet of Things & Network Engineering, Principles of Robot Control Technology, Technology of IoT Location, Computer Graphics and Image Processing.

Select at least 8 credits on direction 1 and at least 9 credits on direction 2.

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：袁景凌

专业培养方案责任人：陆丽萍

# 【软件工程专业（数字传播工程试点班）】
# 2014 版本科培养方案
# Undergraduate Program for Specialty in Software Engineering (Pilot Class of Digital Media Communication) （2014）

| | | | |
|---|---|---|---|
| 专业名称 | 软件工程（数字传播工程试点班） | 主干学科 | 软件工程、新闻传播 |
| Major | SoftWare Engineering(Pilot Class of Digital Media Communication) | Major Disciplines | SoftWare Engineering，Journalism and Communication |
| 计划学制 | 四年 | 授予学位 | 工学学士 |
| Duration | 4 Years | Degree Granted | Bachelor of Engineering |
| 所属大类 | 计算机类 | 大类培养年限 | **1.5** 年 |
| Disciplinary | Computer | Duration | 1.5 years |

**最低毕业学分规定**

**Graduation Credit Criteria**

| 课程类 Course Classification / 课程性质 Course Nature | 通识课程 Public Basic Courses | 学科大类课程 Basic Disciplinary Courses | 专业课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践 Practice Courses | 课外学分 Study Credit after Class | 总学分 Total Credits |
|---|---|---|---|---|---|---|---|
| 必修课 Required Courses | 36.5 | 44 | 38 | \ | 21.5 | \ | 190 |
| 选修课 Elective Courses | 9 | 2.5 | 28.5 | \ | \ | 10 | |

## 一、培养目标与毕业要求

## Ⅰ Educational Objectives &Requirement

### （一） 培养目标

（1） 具有良好道德与修养，在科学研究、工程开发、应用实现中遵守法律法规，社会和环境意识强，有能力服务社会。

（2） 掌握基本科学方法，具有包括计算思维在内的科学思维能力，运用数学与自然科学基础知识解决实际问题。

（3） 具备运用先进的工程化方法、技术和工具从事软件系统（特别是数字传播类软件系统）的分析、设计、验证、确认、实现、应用和维护，以及软件系统开发管理等的能力，在相关领域具有就业竞争力。

（4） 具有口头和书面表达能力，并能在团队中有效发挥作用。

（5） 具备通过继续教育或其它的终身学习途径拓展自己的能力，紧跟学科和专业发展。

（1） Have good morals and self-cultivation, keep laws and regulations, and hold strong social consciousness and responsibility in research and development.

（2） Master the basic scientific methods, including Scientific thinking skills, the abilities in solving problems using mathematics and natural science knowledge.

（3） Master the skills in applying advanced engineering methods and tools to software system analytic, design, verification, implementation, maintenance and management with high

competitive strength in employment, especially for digital media communication software.

（4） Have oral and written communication skills and be good at teamwork.

（5） Have the abilities in self-improving through continuing education and other education methods and keep up with the cutting edge development of SE.

**（二） 毕业要求**

（1） 掌握从事软件工程专业（数字传播工程方向）工作所需的数学、自然科学知识以及一定的经济学与管理学知识。

（2） 系统掌握软件工程专业（数字传播工程方向）基础理论知识和专业知识，经历系统的专业实践，理解计算和软件工程学科的基本概念、知识结构、典型方法。

（3） 掌握软件工程学科的基本思维方法和研究方法，具有良好的科学素养和强烈的工程意识，具备在数字传播软件系统等方面进行关键技术的分析、 设计、研究、开发的能力以及传播设备与软件的应用、系统集成与管理的能力。

（4） 具有终身学习意识，能够运用现代信息技术获取相关信息和新技术、新知识，持续提高自己的能力。

（5） 了解本专业交叉技术领域的理论前沿、应用前景和发展动态，具有创新意识，并具有技术创新和产品创新初步能力。

（6） 了解有关软件工程与数字出版政策和法规以及有关国际法律、法规，理解工程技术、信息技术应用与数字传播相关的伦理基本要求，在系统设计过程中能够综合考虑经济、环境、法律、安全、健康、伦理等制约因素。

（7） 具有一定的组织管理能力、表达能力、独立工作能力、人际交往能力和团队合作能力。

（8） 具有初步的外语应用能力，能阅读软件工程及相关专业的外文材料，具有一定的国际视野和跨文化交流、竞争与合作能力。

（1） Master the knowledge of SE (Digital Media Communication) in mathematics, natural science, economics and management.

（2） Master the basic theoretical and professional knowledge of SE (Digital Media Communication) and understand the basic concepts, knowledge structure, and classic methods of SE, especially the deep understanding on digital, algorithm and its complexity and reuse of SE.

（3） Master the basic research methodology of SE, good scientific literacy and engineering viewpoint, the ability in applying the learned skills to analyse and solve software engineering problems in Digital Media Communication.

（4） Have the ability in using information technology to obtain knowledge and new technology for self-improving with a lifelong learning attitude.

（5） Know the state of the art of CS, SE and Digital Media Communication majors and have the ability in technical and products innovation.

（6） Know the laws, rules and policies of SE and Digital Media Communication industry and business, the ethics of information engineering, the various factors in system design including economics, environment, laws, security, health and so forth.

（7） Have the ability in team management and collaboration, expression and interpersonal communication, and working independently.

（8） Have the ability in understanding and reading English literature of SE and related majors and have the international view of SE for cross-culture communication, competition and collaboration.

附：培养目标实现矩阵

| | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | | ✓ | ✓ | | |
| 毕业要求 2 | | ✓ | ✓ | | |
| 毕业要求 3 | | ✓ | ✓ | ✓ | |
| 毕业要求 4 | ✓ | | ✓ | | ✓ |
| 毕业要求 5 | | ✓ | ✓ | | ✓ |
| 毕业要求 6 | ✓ | | | ✓ | ✓ |
| 毕业要求 7 | | | ✓ | ✓ | |
| 毕业要求 8 | | | | ✓ | |

## 二、专业核心课程与专业特色课程

## II Core Courses and Characteristic Courses

### （一） 专业核心课程

(I) Core Courses

软件工程、传播学概论、数字出版技术、数据库原理与传播应用、网络技术与传播、新媒体设计技术（Html5、Xml、网页设计、移动 App 设计）、媒体信息系统分析与设计。

Software Engineering, Introduction to Communication, Digital Publishing Technology, Principles of Database and Applications on Communication, Network Technology and Communication, New Media Design(Html5, XML, Html, Mobile App), Media Information System.

### （二） 专业特色课程

(II) Characteristic Courses

用户界面设计、传播大数据技术、SOA 应用开发及案例分析。

Computer Human Interface, Big Media Data Analytics, SOA based Application and Case Study.

附：毕业要求实现矩阵：

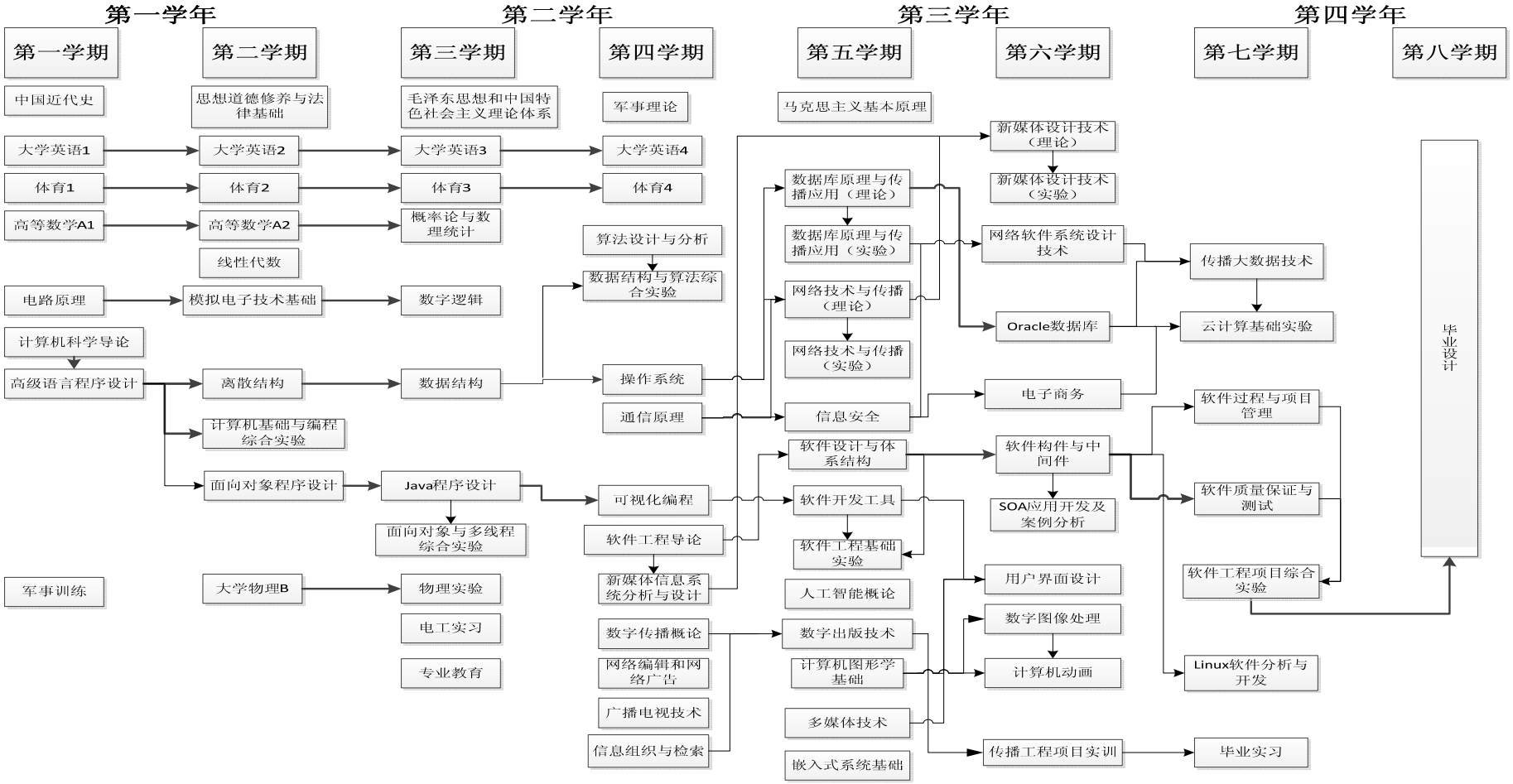
| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业（数字传播工程试点班）毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| | | 思想道德修养与法律基础 | | | | | | ✓ | ✓ | |
| | | 中国近现代史纲要 | | | | | | | ✓ | |
| | | 毛泽东思想和中国特色社会主义理论体系概论 | | | ✓ | | | | ✓ | |
| | | 马克思主义基本原理 | | | ✓ | | | ✓ | ✓ | |
| | | 军事理论 | | | | | | ✓ | ✓ | |
| | | 体育 | | | | | | ✓ | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业（数字传播工程试点班）毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| | | 大学英语 | | | | | | | ✓ | ✓ |
| | | 高等数学 | ✓ | ✓ | ✓ | | | | | |
| | | 电路原理 | ✓ | ✓ | | | ✓ | | | |
| | | 大学物理 | ✓ | | ✓ | ✓ | ✓ | | | |
| | | 物理实验 | ✓ | | ✓ | ✓ | ✓ | | | |
| | | 线性代数 | ✓ | ✓ | ✓ | ✓ | | | | |
| | | 概率论与数理统计 B | ✓ | ✓ | ✓ | ✓ | | | | |
| | | 模拟电子技术基础 C | ✓ | ✓ | | | ✓ | | | |
| | | 数字逻辑 | ✓ | ✓ | ✓ | | | | | |
| | | 计算机科学导论 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 高级语言程序设计 A | ✓ | ✓ | ✓ | | | | | |
| | | 离散结构 | ✓ | ✓ | ✓ | | | | | ✓ |
| | | 计算机基础与编程综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 面向对象程序设计 C | ✓ | ✓ | ✓ | | | | | |
| | | 面向对象与多线程综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 数据结构 | ✓ | ✓ | ✓ | | | | | ✓ |
| | | JAVA 语言程序设计 B | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 数字传播概论 | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| ✓ | | 软件工程 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ✓ | | 新媒体信息系统分析与设计 | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 网络编辑及网络广告 | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| | | 操作系统 | ✓ | ✓ | ✓ | | | | | |
| | | 数据结构与算法综合实验 | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 数字出版技术 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | | 软件设计与体系结构 | ✓ | ✓ | ✓ | ✓ | | | | |
| ✓ | | 数据库原理与传播应用（理论） | ✓ | ✓ | ✓ | ✓ | | ✓ | | |
| | | 数据库原理与传播应用（实验） | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | |
| ✓ | | 网络技术与传播（理论） | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | | 软件工程基础实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 网络技术与传播（实验） | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ✓ | | 新媒体设计技术（理论）（含 html5,xml,app 设计、网页设计） | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | | 新媒体设计技术（实验） | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业（数字传播工程试点班）毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | | 软件构件与中间件技术 | ✓ | ✓ | ✓ | | ✓ | | | |
| | | 软件过程与项目管理 | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| | | 软件质量保证与测试 | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| | | 软件工程项目综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 通信原理 C | ✓ | ✓ | | | | | | |
| | | 算法设计与分析 B | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 可视化编程 | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 广播电视技术 | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | | 信息组织与检索（含自然语言处理） | ✓ | ✓ | ✓ | | ✓ | | | |
| | | 软件开发工具 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 人工智能概论 | ✓ | ✓ | ✓ | | | | | |
| | | 多媒体技术 | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 信息安全 | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | | 计算机图形学基础 B | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 嵌入式系统基础 | | ✓ | ✓ | | ✓ | | | |
| | | 网络软件系统设计技术 | ✓ | ✓ | ✓ | | ✓ | | ✓ | |
| | | 电子商务 | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | ✓ | 用户界面设计 | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 计算机动画 | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 数字图像处理 B | | ✓ | ✓ | ✓ | ✓ | | | |
| | | Oracle 数据库技术 | | ✓ | ✓ | ✓ | | ✓ | | |
| | ✓ | SOA 应用开发及案例分析 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 云计算基础实验 | | ✓ | ✓ | | ✓ | | | |
| | ✓ | 传播大数据技术（算法、采集） | | ✓ | ✓ | ✓ | ✓ | | | |
| | | Linux 软件分析与开发 | | ✓ | ✓ | | ✓ | | | |
| | | 军事训练 | | | | | | ✓ | ✓ | |
| | | 专业教育 | | | | ✓ | ✓ | ✓ | ✓ | |
| | | 电工电子实习 A | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 传播工程项目实训 | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | | 毕业实习 | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 毕业设计 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 三、课程教学进程图

## Ⅲ　Teaching Process Map



## 四、理论教学建议进程表

## Ⅳ Theory Course Schedule

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 通识课程 Public Basic Courses | 必修课 Required Courses | 4120027110 | 计算机科学导论 Introduction to Computer Science | 2.5 | 40 | 10 | | | | 1 | | |
| | | 4120020110 | 高级语言程序设计 A Foundation of Programming | 4 | 64 | 16 | | | | 1 | | |
| | | 4220002110 | 中国近现代史纲要 Outline of Chinese Contemporary and Modern History | 2 | 32 | | | | | 1-6 | | |
| | | 4220001110 | 思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law | 3 | 48 | | | 8 | | 1-6 | | |
| | | 4220003110 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and | 4 | 96 | | | 32 | | 1-6 | | |
| | | 4220005110 | 马克思主义基本原理 Marxism Philosophy | 3 | 48 | | | 8 | | 1-6 | | |
| | | 1060001110 | 军事理论 Military Theory | 2 | 32 | | | 16 | | 2-4 | | |
| | | 4210001110 | 体育 1 Physical Education Ⅰ | 1 | 32 | | | | | 1 | | |
| | | 4210002110 | 体育 2 Physical Education Ⅱ | 1 | 32 | | | | | 2 | 体育 1 | |
| | | 4210003110 | 体育 3 Physical Education Ⅲ | 1 | 32 | | | | | 3 | 体育 2 | |
| | | 4210004110 | 体育 4 Physical Education Ⅳ | 1 | 32 | | | | | 4 | 体育 3 | |
| | | 4030002110 | 大学英语 A1 College English A 1 | 3 | 64 | | | | 16 | 1 | | |
| | | 4030003110 | 大学英语 A2 College English A Ⅱ | 3 | 64 | | | | 16 | 2 | 大学英语 A1 | |
| | | 4030004110 | 大学英语 A3 College English A Ⅲ | 3 | 64 | | | | 16 | 3 | 大学英语 A2 | |
| | | 4030005110 | 大学英语 A4 College English A Ⅳ | 3 | 64 | | | | 16 | 4 | 大学英语 A3 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 36.5 | 744 | 26 | | 64 | 64 | | | |
| | 选修课 Elective Courses | 创新创业类 Innovation and Entrepreneurship Courses | 全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。<br>All students are required to obtain at least 9 credits, and must select art courses from *Art and Physical Education Courses* to obtain at least 2 credits. Science and engineering students should select at least one course from *Arts and Social Science Courses* or *Economy and Management Courses*, and other students should select at least one course from *Science and Technology Courses*. | | | | | | | | | |
| | | 人文社科类 Arts and Social Science Courses | | | | | | | | | | |
| | | 经济管理类 Economics and Management Courses | | | | | | | | | | |
| | | 科学技术类 Science and Technology Courses | | | | | | | | | | |
| | | 艺术体育类 Art and Physical Education Courses | | | | | | | | | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | | |
| 学科大类课程 Basic Disciplinary Courses | 必修课 Required Courses | 4050063110 | 高等数学 A1<br>Advanced Mathematics A1 | 5 | 80 | | | | | 1 | | |
| | | 4050064110 | 高等数学 A2<br>Advanced Mathematics A2 | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4110019110 | 电路原理 B<br>Circuit Principle B | 4 | 64 | 16 | | | | 1 | | |
| | | 4050023110 | 大学物理<br>PhysicsB | 5 | 88 | | | | | 2 | | |
| | | 4050229110 | 线性代数<br>Linear Algebra | 2.5 | 40 | | | | | 2 | | |
| | | 4120045110 | 离散结构<br>Discrete Structures | 4 | 64 | | | | | 2 | | |
| | | 4050058110 | 概率论与数理统计 B<br>Probability and Mathematics Statistic B | 3 | 48 | | | | | 3 | | |
| | | 4110050110 | 模拟电子技术基础 C<br>Analog Electronic Techniques C | 3 | 48 | 8 | | | | 3 | 电路原理 B | |
| | | 4050224110 | 物理实验 B<br>Physics Lab. B | 1 | 32 | 32 | | | | 3 | | |
| | | 4120079110 | 数字逻辑<br>Digital Circuits | 3 | 48 | 8 | | | | 3 | 电路原理 B | |
| | | 4120264141 | 数据结构<br>Data Structures | 4 | 64 | | 12 | | | 3 | 高级语言程序设计 A | |
| | | 4120261141 | 计算机基础与编程综合实验<br>Experiments on Computer and Programming | 1 | 32 | 32 | | | | 2 | | |
| | | 4120048110 | 面向对象程序设计 C<br>Object-oriented methodology | 2.5 | 40 | | 12 | | | 2 | 高级语言程序设计 A | |
| | | 4120263140 | 面向对象与多线程综合实验<br>Experiments on Object-oriented and Multithreading Programming | 1 | 32 | 32 | | | | 3 | | |
| | | 4120299140 | JAVA 语言程序设计 B<br>Java Programming B | 2.5 | 48 | | 8 | | | 3 | 高级语言程序设计 A | |
| | | 小 计 Subtotal | | 46.5 | 808 | 128 | 32 | | | | | |
| 专业课程 Specialized Courses | 必修课 Required Courses | 4020321140 | 数字传播概论<br>Outline of Digit Communication | 2 | 32 | | | | | 4 | 面向对象程序设计 C | |
| | | 4120062110 | 软件工程导论<br>Software Engineering | 2.5 | 40 | | | | | 4 | 面向对象程序设计 C | |
| | | 4020322140 | 网络编辑及网络广告<br>Online Editing and Advertising | 2 | 32 | | | | | 4 | 数字逻辑 | |
| | | 4120272140 | 操作系统<br>Operating System | 4 | 64 | | 12 | 8 | | 4 | | |
| | | 4120265140 | 数据结构与算法综合实验<br>Experiments on Data Structure and Algorithms | 1 | 32 | 32 | | | | 4 | 面向对象程序设计 C | |
| | | 4120282140 | 数据库原理与传播应用<br>Principles of Database System and Applications on Communication | 2 | 32 | | | | | 4 | | |
| | | 4120283140 | 数据库原理与传播应用实验<br>Principles of Database System and Applications on Communication (Experiments) | 1 | 32 | 32 | | | | 5 | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4120280140 | 新媒体信息系统分析与设计<br>New Media Information System | 3 | 48 | 8 | | | | 5 | 线性代数 | |
| | | 4120281140 | 数字出版技术<br>Digital Publishing Technology | 3 | 48 | | | | | 5 | | |
| | | 4120175120 | 软件设计与体系结构<br>Software Design and Architecture | 2 | 32 | 8 | | | | 5 | | |
| | | 4120284140 | 网络技术与传播<br>Network Technology and Communication | 2.5 | 40 | | | | | 5 | | |
| | | 4120275141 | 软件工程基础实验<br>Primary Experiments on Software Engineering | 1 | 32 | 32 | | | | 5 | JAVA 语言程序设计 B | |
| | | 4120285140 | 网络技术与传播实验<br>Network Technology and Communication (Experiments) | 1 | 32 | 32 | | | | 5 | | |
| | | 4120286140 | 新媒体设计技术<br>New Media Design | 3 | 48 | | | | | 6 | | |
| | | 4120287140 | 新媒体设计技术实验<br>New Media Design (Experiments) | 1 | 32 | 32 | | | | 6 | | |
| | | 4120063110 | 软件构件与中间件技术<br>Software Components and Middleware Technology | 2 | 32 | 8 | | | | 6 | JAVA 语言程序设计 B | |
| | | 4120069110 | 软件过程与项目管理<br>Software Process and Project Management | 2 | 32 | 8 | | | | 7 | 信息安全 | |
| | | 4120058110 | 软件质量保证与测试 B<br>Software Quality and Testing | 2 | 32 | 8 | | | | 7 | | |
| | | 4120276141 | 软件工程项目综合实验<br>Senior Experiments on Software Engineering | 1 | 32 | 32 | | | | 7 | | |
| | | 小 计 Subtotal | | 38 | 704 | 232 | 12 | 8 | | | | |
| 专业课程 Specialized Courses | 选修课 Elective Courses | 4120084110 | 通信原理 C<br>Principles of Communication C | 2.5 | 40 | 8 | | | | 4 | 数字逻辑 | |
| | | 4120082110 | 算法设计与分析 B<br>Algorithm Design and Analysis B | 2 | 32 | | 6 | | | 4 | 数字图像处理 B | |
| | | 4120044110 | 可视化编程<br>Visual Programming | 2.5 | 40 | | 10 | | | 4 | 面向对象程序设计 C | |
| | | 4020323140 | 广播电视技术<br>Radio and Television Technology | 2 | 32 | | | | | 4 | | |
| | | 4120288140 | 信息组织与检索（含自然语言处理）<br>Information Retrieval (NLP) | 2 | 32 | | | | | 4 | | |
| | | 4120065110 | 软件开发工具<br>Software DevelopmentTools | 2 | 32 | 16 | | | | 5 | JAVA 语言程序设计 B | |
| | | 4120055110 | 人工智能概论<br>Introduction to Artificial Intelligence | 2 | 32 | | | | | 5 | 离散结构 | |
| | | 4120018110 | 多媒体技术<br>Multimedia Technique | 2 | 32 | 8 | | | | 5 | 可视化编程 | |
| | | 4120102110 | 信息安全<br>Information Security | 2 | 32 | 8 | | | | 5 | | |
| | | 4120031110 | 计算机图形学基础 B<br>Foundation of Computer Graphics | 2 | 32 | 8 | | | | 5 | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | | |
| | | 4120050110 | 嵌入式系统基础<br>Embedded System | 2 | 32 | 8 | | | | 5 | | |
| | | 4120089110 | 网络软件系统设计技术<br>Network Software System Design | 2 | 32 | 12 | | | | 6 | | |
| | | 4120289140 | 电子商务<br>E-commerce | 2 | 32 | | | | | 6 | | |
| | | 4120290140 | 用户界面设计<br>Computer Human Interface | 3 | 48 | 16 | | | | 6 | | |
| | | 4120291140 | 计算机动画<br>Computer Animation | 2 | 32 | | | | | 6 | | |
| | | 4120080110 | 数字图像处理 B<br>Digital Image Processing B | 2 | 32 | 8 | | | | 6 | 人工智能概论 | |
| | | 4120005110 | Oracle 数据库技术<br>Oracle Database | 2 | 32 | 8 | | | | 6 | | |
| | | 4120277141 | SOA 应用开发及案例分析<br>SOA Application and Case Study | 2 | 32 | 8 | | | | 6 | | |
| | | 4120278141 | 云计算基础实验<br>Experiments on Cloud Computing | 1 | 32 | 32 | | | | 7 | | |
| | | 4120292140 | 传播大数据技术（算法、采集）<br>Big Media Data Analytics | 2 | 32 | | | | | 7 | | |
| | | 4120004110 | Linux 软件分析与开发<br>Software Development on Linux | 2 | 32 | 8 | | | | 7 | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 43 | 704 | 148 | 16 | | | | | |
| | | 修读说明：要求最少选修 28.5 学分。<br>NOTE: The score of minimum subtotal credits is 28 .5 | | | | | | | | | | |

## 五、集中性实践教学环节

## Ⅴ Practice Schedule

| 课程编号 Course Number | 实践环节名称 Practice Courses Name | 周数 Weeks | 学分 Crs | 建议修读学期 Suggested Term | 第二专业 Second Major |
|---|---|---|---|---|---|
| 1060002110 | 军事训练<br>Military Training | 3 | 1.5 | 1 | |
| 4120144110 | 专业教育<br>Introduction to Software Engineering Major | 1 | 1 | 3 | |
| 4100068110 | 电工电子实习 A<br>Practice in Electrical Engineering & Electronics A | 2 | 2 | 3 | |
| 4120293140 | 传播工程项目实训<br>Practice on Communication Engineering Projects | 3 | 3 | 6 | |
| 4120115110 | 毕业实习<br>Graduation Practice | 3 | 3 | 7 | |
| 4120111110 | 毕业设计<br>Bachelor Thesis | 17 | 11 | 8 | |
| 小 计 Subtotal | | 29 | 21.5 | | |

## 六、修读指导

## Ⅵ Recommendations on Course Studies

1. 本专业课程设置方法参考 IEEE2001 SE 推荐的计算机科学优先方法，并按照自底向上的方法展开的软件工程类课程的学习，课程启动策略为程序设计优先方式。

本专业重要的学科大类基础课程和专业课程有：计算机科学导论、高级语言程序设计、离散结构、数据结构、操作系统、数据库系统、计算机网络、软件工程导论、软件设计与体系结构、软件构件与中间件技术、软件项目管理、软件测试、信息安全。

2. 为体现本专业的专业特色与方向，本专业修读课程设置有数字传播课程群：

数字传播概论、网络编辑及网络广告、数字出版技术、新媒体设计技术、广播电视技术、计算机动画。

1. The SE major program refers to IEEE 2001 SE which gives priority to computer science discipline and is formulated according to the bottom-to-up study strategy and programming-oriented course starting strategy.

The discipline courses and major courses of SE are: Introduction to Computer Science, Advanced Language Programming, Discrete structure, Data Structure, Operating System, Compiler Theory, Principles of Database Systems, Computer Networks, Introduction to Software Engineering, Software Design and Architecture, Software Components and Middleware Technology, Software Project Management, Software Testing, Information Security.

2. The featured study field and direction is Track of Digital Media Communication including specialized elective courses:

Introduction to Digital Communication, Online Editing and Advertising, Digital Publishing Technology, Radio and Television Technology, Computer Animation.

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：袁景凌

专业培养方案责任人：刘东飞

# 【软件工程专业（卓越工程师）】2014 版本科培养方案
# Undergraduate Program for Specialty in Software Engineering （Excellent Engineering Class）(2014)

| | | | |
|---|---|---|---|
| 专业名称 | 软件工程（卓越工程师） | 主干学科 | 软件工程 |
| Major | SoftWare Engineering（Excellent Engineering Class） | Major Disciplines | SoftWare Engineering |
| 计划学制 | 四年 | 授予学位 | 工学学士 |
| Duration | 4 Years | Degree Granted | Bachelor of Engineering |
| 所属大类 | 计算机类 | 大类培养年限 | **1.5 年** |
| Disciplinary | Computer | Duration | 1.5 years |

**最低毕业学分规定**
**Graduation Credit Criteria**

| 课程类 Course Classification / 课程性质 Course Nature | 通识课程 Public Basic Courses | 学科大类课程 Basic Disciplinary Courses | 专业课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践 Practice Courses | 课外学分 Study Credit after Class | 总学分 Total Credits |
|---|---|---|---|---|---|---|---|
| 必修课 Required Courses | 36.5 | 46.5 | 37 | \ | 31.5 | \ | 190 |
| 选修课 Elective Courses | 9 | \ | 19.5 | \ | \ | 10 | |

## 一、培养目标与毕业要求

### Ⅰ Educational Objectives &Requirement

### （一） 培养目标

（1） 具有良好的工程职业道德、追求卓越的态度、爱国敬业和艰苦奋斗精神、较强的社会责任感和较好的人文素养、较强工程实践能力。
（2） 掌握基本科学方法，具有包括计算思维在内的科学思维能力，运用数学与自然科学基础知识解决实际工程问题。
（3） 具备运用先进的工程化方法、技术和工具从事软件系统的分析、设计、验证、确认、实现、应用和维护，以及软件系统开发管理等的能力，在相关领域具有就业竞争力。
（4） 具有口头和书面表达能力，并能在团队中有效发挥作用。
（5） 具备通过继续教育或其它的终身学习途径拓展自己的能力，紧跟学科和专业发展。

（1） Have good morals and self-cultivation, keep laws and regulations, and hold strong social consciousness and responsibility in research and development, and practical capability;
（2） Master the basic scientific methods, including Scientific thinking skills, the abilities in solving problems using mathematics and natural science knowledge;
（3） Master the skills in applying advanced engineering methods and tools to software system analytic, design, verification, implementation, maintenance and management with high competitive strength in employment;
（4） Have oral and written communication skills and be good at teamwork;
（5） Have the abilities in self-improving through continuing education and other education methods and keep up with the cutting edge development of SE.

### （二） 毕业要求

（1） 掌握从事软件工程专业工作所需的数学、自然科学知识以及一定的经济学与管理学知识。
（2） 掌握扎实的软件工程专业基础理论知识和专业知识，经历系统的专业实践，理解计算和软件工程学科的基本概念、知识结构、典型方法，建立数字化、算法与复杂性、重用等核心专业意识。
（3） 掌握软件工程学科的基本思维方法和研究方法，具有良好的科学素养和强烈的工程意识，具备综合运用所掌握的知识、方法、技术分析、提出方案并解决软件工程实际问题，能够参与复杂

软件系统的设计，并具有运行和维护能力。

（4） 具有终身学习意识，能够运用现代信息技术获取相关信息和新技术、新知识，持续提高自己的能力。

（5） 了解计算和软件工程学科发展现状和趋势，具有创新意识，并具有技术创新和产品创新初步能力。

（6） 了解与软件工程专业相关的职业和行业的重要法律、法规及方针与政策，理解工程技术与信息技术应用相关的伦理基本要求，在系统设计过程中能够综合考虑经济、环境、法律、安全、健康、伦理等制约因素。

（7） 具有一定的组织管理能力、表达能力、独立工作能力、人际交往能力和团队合作能力。

（8） 具有初步的外语应用能力，能阅读软件工程及相关专业的外文材料，具有一定的国际视野和跨文化交流、竞争与合作能力。

（1） Master the knowledge of SE in mathematics, natural science, economics and management.

（2） Master the basic theoretical and professional knowledge of software engineering and understand the basic concepts, knowledge structure, and classic methods of SE, especially the deep understanding on digital, algorithm and its complexity and reuse of SE.

（3） Master the basic research methodology of SE, good scientific literacy and engineering viewpoint, the ability in applying the learned skills to analyse and solve software engineering problems.

（4） Have the ability in using information technology to obtain knowledge and new technology for self-improving with a lifelong learning attitude.

（5） Know the state of the art of CS and SE and have the ability in technical and products innovation.

（6） Know the laws, rules and policies of SE industry and business, the ethics of information engineering, the various factors in system design including economics, environment, laws, security, health and so forth.

（7） Have the ability in team management and collaboration, expression and interpersonal communication, and working independently.

（8） Have the ability in understanding and reading English literature of SE and related majors and have the international view of SE for cross-culture communication, competition and collaboration.

附：培养目标实现矩阵

| | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | | ✓ | ✓ | | |
| 毕业要求 2 | | ✓ | ✓ | | |
| 毕业要求 3 | | ✓ | ✓ | | |
| 毕业要求 4 | ✓ | | ✓ | | ✓ |
| 毕业要求 5 | | | ✓ | | ✓ |
| 毕业要求 6 | ✓ | | | ✓ | ✓ |
| 毕业要求 7 | | | ✓ | ✓ | |
| 毕业要求 8 | | | | ✓ | ✓ |

## 二、专业核心课程与专业特色课程

## II Core Courses and Characteristic Courses

### （一）专业核心课程

### (I) Core Courses

高级语言程序设计、离散结构、数据结构、计算机组成原理、操作系统、计算机网络、软件工程导论、软件设计与体系结构、软件项目管理、软件测试。

Advanced Language Programming, Discrete Structure, Data Structure, Principles of Computer Organization, Operating System, Computer Network, Introduction to Software Engineering, Software Design and Architecture, Software Project Management, Software Testing.

### （二）专业特色课程

### (II) Characteristic Courses

网络软件系统设计技术、嵌入式应用软件开发、人工智能、企业级系统架构实训。

Network Software System Design, Embedded Application Software Development， Artificial Intelligence, Practice on Enterprise-level System Architecture.

附：毕业要求实现矩阵：

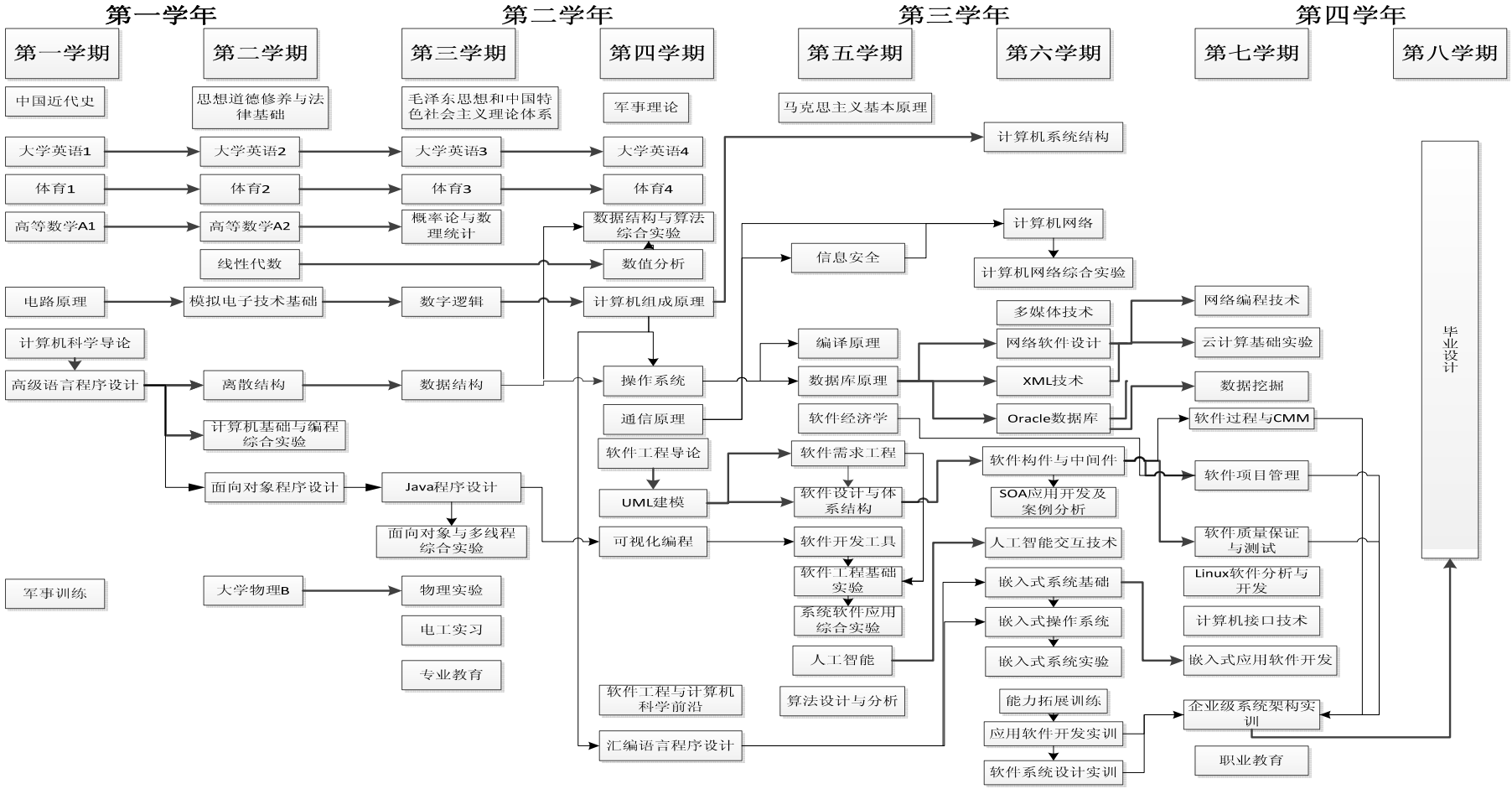
| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业（卓越工程师班）毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| | | 思想道德修养与法律基础 | | | | | | ✓ | ✓ | |
| | | 中国近现代史纲要 | | | | | | | ✓ | |
| | | 毛泽东思想和中国特色社会主义理论体系概论 | | | ✓ | | | | ✓ | |
| | | 马克思主义基本原理 | | | ✓ | | | ✓ | ✓ | |
| | | 军事理论 | | | | | | ✓ | ✓ | |
| | | 体育 | | | | | | ✓ | | |
| | | 大学英语 | | | | | | | ✓ | ✓ |
| | | 高等数学 | ✓ | ✓ | ✓ | | | | | |
| | | 电路原理 | ✓ | ✓ | | | ✓ | | | |
| | | 大学物理 | ✓ | | ✓ | ✓ | ✓ | | | |
| | | 物理实验 | ✓ | | ✓ | ✓ | ✓ | | | |
| | | 线性代数 | ✓ | ✓ | ✓ | ✓ | | | | |
| | | 概率论与数理统计 B | ✓ | ✓ | ✓ | ✓ | | | | |
| | | 模拟电子技术基础 C | ✓ | ✓ | | | ✓ | | | |
| | | 数字逻辑 | ✓ | ✓ | ✓ | | | | | |
| | | 计算机科学导论 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ✓ | | 高级语言程序设计 A | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 离散结构 | ✓ | ✓ | ✓ | | | | | ✓ |
| | | 计算机基础与编程综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 面向对象程序设计 C | ✓ | ✓ | ✓ | | | | | |
| | | 面向对象与多线程综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| ✓ | | 数据结构 A | ✓ | ✓ | ✓ | | | | | ✓ |
| | | JAVA 语言程序设计 B | ✓ | ✓ | ✓ | | | | | |
| | | 计算机数值分析 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 数据结构与算法综合实验 | ✓ | ✓ | ✓ | | | | | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业（卓越工程师班）毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| ✓ | | 计算机组成原理 B | ✓ | ✓ | ✓ | | | | | |
| ✓ | | 软件工程导论 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ✓ | | 操作系统 | ✓ | ✓ | ✓ | | | | | |
| | | 数据库系统原理 | ✓ | ✓ | ✓ | | | | | |
| | | 编译原理 | ✓ | ✓ | ✓ | | | | | |
| | | 软件需求工程 B | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| ✓ | | 软件设计与体系结构 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | | 系统软件应用综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 软件工程基础实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| ✓ | | 计算机网络 B | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| | | 软件构件与中间件技术 B | ✓ | ✓ | ✓ | | ✓ | | | |
| | | 计算机网络综合实验 | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| ✓ | | 软件项目管理 B | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| | | 软件质量保证与测试 B | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| ✓ | | 软件工程项目综合实验 | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 可视化编程 | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 软件工程与计算机科学前沿 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 算法设计与分析 B | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 软件开发工具 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 软件工程经济学 | ✓ | ✓ | ✓ | | | ✓ | | |
| | | 多媒体技术 | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 计算机系统结构 B | | ✓ | ✓ | | | | | |
| | | 软件过程与 CMM | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| | | 通信原理 C | | ✓ | ✓ | | | | | |
| | | 信息安全 | | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | ✓ | 网络软件系统设计技术 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | XML 技术 | | ✓ | ✓ | | ✓ | ✓ | ✓ | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 软件工程专业（卓越工程师班）毕业要求 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） |
| | | Oracle 数据库技术 | | ✓ | ✓ | ✓ | | ✓ | | |
| | | 网络软件编程技术 | | ✓ | ✓ | | ✓ | | | |
| | | SOA 应用开发及案例分析 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 计算机图形学基础 B | | ✓ | ✓ | ✓ | ✓ | | | |
| | ✓ | 人工智能概论 | ✓ | ✓ | ✓ | | | | | |
| | | 人机智能交互技术 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 数据挖掘 C | | ✓ | ✓ | | ✓ | | | |
| | | 数字图像处理 B | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 云计算基础实验 | | ✓ | ✓ | | ✓ | | | |
| | | 汇编语言程序设计 | ✓ | ✓ | ✓ | | | | | |
| | | 嵌入式系统基础 | | ✓ | ✓ | | ✓ | | | |
| | | 嵌入式操作系统 | | ✓ | ✓ | | ✓ | | | |
| | | 嵌入式系统实验 | | ✓ | ✓ | | ✓ | | | |
| | | 嵌入式应用软件开发 | | ✓ | ✓ | | ✓ | ✓ | | |
| | | 计算机接口技术 | | ✓ | ✓ | | ✓ | | | |
| | | Linux 软件分析与开发 | | ✓ | ✓ | | ✓ | | | |
| | | 军事训练 | | | | | | ✓ | ✓ | |
| | | 专业教育 | | | | ✓ | ✓ | ✓ | ✓ | |
| | | 电工电子实习 A | ✓ | ✓ | ✓ | | | | ✓ | |
| | | 能力拓展训练 | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 软件企业认知实习 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 应用软件开发实训 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 软件系统设计实训 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 职业教育 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | ✓ | 企业级系统架构实训 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 毕业设计 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 三、课程教学进程图

## Ⅲ　Teaching Process Map



## 四、理论教学建议进程表

## Ⅳ Theory Course Schedule

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 通识课程 Public Basic Courses | 必修课 Required Courses | 4120027110 | 计算机科学导论 Introduction to Computer Science | 2.5 | 40 | 10 | | | | 1 | | |
| | | 4120020110 | 高级语言程序设计 A Foundation of Programming | 4 | 64 | 16 | | | | 1 | | |
| | | 4220002110 | 中国近现代史纲要 Outline of Chinese Contemporary and Modern History | 2 | 32 | | | | | 1-6 | | |
| | | 4220001110 | 思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law | 3 | 48 | | | 8 | | 1-6 | | |
| | | 4220003110 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 4 | 96 | | | 32 | | 1-6 | | |
| | | 4220005110 | 马克思主义基本原理 Marxism Philosophy | 3 | 48 | | | 8 | | 1-6 | | |
| | | 1060001110 | 军事理论 Military Theory | 2 | 32 | | | 16 | | 2-4 | | |
| | | 4210001110 | 体育 1 Physical Education Ⅰ | 1 | 32 | | | | | 1 | | |
| | | 4210002110 | 体育 2 Physical Education Ⅱ | 1 | 32 | | | | | 2 | 体育 1 | |
| | | 4210003110 | 体育 3 Physical Education Ⅲ | 1 | 32 | | | | | 3 | 体育 2 | |
| | | 4210004110 | 体育 4 Physical Education Ⅳ | 1 | 32 | | | | | 4 | 体育 3 | |
| | | 4030002110 | 大学英语 A1 College English A 1 | 3 | 64 | | | | 16 | 1 | | |
| | | 4030003110 | 大学英语 A2 College English A Ⅱ | 3 | 64 | | | | 16 | 2 | 大学英语 A1 | |
| | | 4030004110 | 大学英语 A3 College English A Ⅲ | 3 | 64 | | | | 16 | 3 | 大学英语 A2 | |
| | | 4030005110 | 大学英语 A4 College English A Ⅳ | 3 | 64 | | | | 16 | 4 | 大学英语 A3 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 36.5 | 744 | 26 | | 64 | 64 | | | |
| | 选修课 Elective Courses | 创新创业类 Innovation and Entrepreneurship Courses | 全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from *Art and Physical Education Courses* to obtain at least 2 credits. Science and engineering students should select at least one course from *Arts and Social Science Courses* or *Economy and Management Courses*, and other students should select at least one course from *Science and Technology Courses*. | | | | | | | | | | |
| | | 人文社科类 Arts and Social Science Courses | | | | | | | | | | |
| | | 经济管理类 Economics and Management Courses | | | | | | | | | | |
| | | 科学技术类 Science and Technology Courses | | | | | | | | | | |
| | | 艺术体育类 Art and Physical Education Courses | | | | | | | | | | |

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 学科大类课程 Basic Disciplinary Courses | 必修课 Required Courses | 4050063110 | 高等数学 A1<br>Advanced Mathematics A1 | 5 | 80 | | | | | 1 | | |
| | | 4050064110 | 高等数学 A2<br>Advanced Mathematics A2 | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4110019110 | 电路原理 B<br>Circuit Principle B | 4 | 64 | 16 | | | | 1 | | |
| | | 4050023110 | 大学物理<br>PhysicsB | 5 | 88 | | | | | 2 | | |
| | | 4050229110 | 线性代数<br>Linear Algebra | 2.5 | 40 | | | | | 2 | | |
| | | 4120045110 | 离散结构<br>Discrete Structures | 4 | 64 | | | | | 2 | | |
| | | 4050058110 | 概率论与数理统计 B<br>Probability and Mathematics Statistic B | 3 | 48 | | | | | 3 | | |
| | | 4110050110 | 模拟电子技术基础 C<br>Analog Electronic Techniques C | 3 | 48 | 8 | | | | 3 | 电路原理 B | |
| | | 4050224110 | 物理实验<br>Physics Lab. | 1 | 32 | 32 | | | | 3 | | |
| | | 4120079110 | 数字逻辑<br>Digital Circuits | 3 | 48 | 8 | | | | 3 | 电路原理 B | |
| | | 4120264141 | 数据结构<br>Data Structures | 4 | 64 | | 16 | | | 3 | 高级语言程序设计 A | |
| | | 4120261141 | 计算机基础与编程综合实验<br>Experiments on Computer and Programming | 1 | 32 | 32 | | | | 2 | | |
| | | 4120044110 | 面向对象程序设计 C<br>Object-oriented methodology | 2.5 | 40 | | 12 | | | 2 | 高级语言程序设计 A | |
| | | 4120263140 | 面向对象与多线程综合实验<br>Experiments on Object-oriented and Multithreading Programming | 1 | 32 | 32 | | | | 3 | | |
| | | 4120299140 | JAVA 语言程序设计 B<br>Java Programming B | 2.5 | 48 | | 8 | | | 3 | 高级语言程序设计 A | |
| | | 小 计 Subtotal | | 46.5 | 808 | 128 | 36 | | | | | |
| 专业课程 Specialized Courses | 必修课 Required Courses | 4120265140 | 数据结构与算法综合实验<br>Experiments on Data Structure and Algorithms | 1 | 32 | 32 | | | | 4 | | |
| | | 4120028110 | 计算机数值分析 B<br>Computer Numerical Analysis B | 2.5 | 40 | 8 | | | | 4 | 线性代数 | |
| | | 4120083110 | 计算机组成原理 B<br>Principles of Computer Organization B | 4 | 64 | 10 | | 8 | | 4 | 数字逻辑 | |
| | | 4120062110 | 软件工程导论<br>Introduction to Software Engineering B | 2.5 | 40 | | | | | 4 | 面向对象程序设计 C | |
| | | 4120072110 | 操作系统<br>Operating System | 4 | 64 | 12 | | 8 | | 4 | | |
| | | 4120070110 | 编译原理<br>Principles of Compiler | 3.5 | 56 | 8 | | | | 5 | | |
| | | 4120175120 | 软件设计与体系结构 B<br>Software Design and Architecture B | 2 | 32 | | | | | 5 | 软件工程导论 | |
| | | 4120071110 | 软件需求工程 B<br>Software Requirement Project B | 2 | 32 | | | | | 5 | 软件工程导论 | |
| | | 4120275141 | 软件工程基础实验<br>Primary Experiments on Software Engineering | 1 | 32 | 32 | | | | 5 | | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4120273141 | 数据库系统原理<br>Principles of Database System | 3 | 48 | | | | | 5 | 操作系统 | |
| | | 4120274141 | 系统软件应用综合实验<br>Experiments on Application Software | 1 | 32 | 32 | | | | 5 | | |
| | | 4120034110 | 计算机网络 B<br>Computer Networks B | 2.5 | 40 | | | | | 6 | | |
| | | 4120271141 | 计算机网络综合实验<br>Experiments on Computer Networks | 1 | 32 | 32 | | | | 6 | | |
| | | 4120063110 | 软件构件与中间件技术<br>Software Component and Middleware | 2 | 32 | 8 | | | | 6 | JAVA 语言程序设计 B | |
| | | 4120276141 | 软件工程项目综合实验<br>Senior Experiments on Software Engineering | 1 | 32 | 32 | | | | 6 | | |
| | | 4120068110 | 软件项目管理 B<br>Software Project Management | 2. | 32 | 6 | | | | 6 | 软件工程导论 | |
| | | 4120057110 | 软件质量保证与测试 B<br>Software Quality and Testing B | 2 | 32 | | | | | 6 | 软件工程导论 | |
| | | 小 计 Subtotal | | 37 | 672 | 212 | | 16 | | | | |
| | 选修课 Elective Courses | 4120048110 | 可视化编程<br>Visual Programming | 2.5 | 40 | 10 | | | | 4 | 面向对象程序设计 C | |
| | | 4120149110 | 通信原理 C<br>Principles of Communication C | 2.5 | 40 | 8 | | | | 4 | 模拟电子技术基础 C | |
| | | 4120151110 | 软件工程与计算机科学前沿<br>Frontiers of Software Engineering & Computer Science | 1 | 16 | | | | | 4 | 计算机科学导论 | |
| | | 4120082110 | 算法设计与分析 B<br>Algorithm Design and Analysis B | 2 | 32 | 8 | | | | 4 | 数字图像处理 B | |
| | | 4120022110 | 汇编语言程序设计<br>Assembly Language Programming | 2.5 | 40 | 16 | | | | 4 | 可视化编程 | |
| | | 4120150110 | 软件工程经济学<br>Economics of Software Engineering | 1 | 16 | | | | | 5 | 计算机科学导论 | |
| | | 4120065110 | 软件开发工具<br>Software Development Tools | 2 | 32 | 12 | | | | 5 | JAVA 语言程序设计 B | |
| | | 4120102110 | 信息安全<br>Information Security | 2 | 32 | 8 | | | | 5 | 计算机网络 B | |
| | | 4120055110 | 人工智能概论<br>Introduction to Artificial Intelligence | 2 | 32 | | | | | 5 | 离散结构 | |
| | | 4120018110 | 多媒体技术<br>Multimedia Technique | 2 | 32 | 8 | | | | 5 | 可视化编程 | |
| | | 4120050110 | 嵌入式系统基础<br>Embedded System | 2 | 32 | 8 | | | | 5 | 计算机组成原理 B | |
| | | 4120089110 | 网络软件系统设计技术<br>Network Software System Design | 2 | 32 | 12 | | | | 6 | 计算机网络 B | |
| | | 4120010110 | XML 技术<br>XML Technology | 2 | 32 | 8 | | | | 6 | 计算机网络 B | |
| | | 4120005110 | Oracle 数据库技术<br>Oracle Database | 2 | 32 | 8 | | | | 6 | 数据库系统原理 | |
| | | 4120078110 | 数据挖掘 C<br>Data Mining | 2 | 32 | | 8 | | | 6 | 人工智能概论 | |
| | | 4120049110 | 嵌入式操作系统<br>Embedded Operating System | 2 | 32 | 8 | | | | 6 | 操作系统 | |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including | | | | | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | | | |
| | | 4120054110 | 嵌入式应用软件开发<br>Embedded Application Development | 2 | 32 | 8 | | | | 6 | 嵌入式操作系统 | |
| | | 4120279141 | 嵌入式系统实验<br>Experiments on Embedded System | 1 | 32 | 32 | | | | 6 | 嵌入式系统基础 | |
| | | 4120277141 | SOA 应用开发与案例分析<br>SOA Application and Case Study | 2 | 32 | 8 | | | | 6 | 计算机网络 B | |
| | | 4120088110 | 网络软件编程技术<br>Network Software Programming | 2.5 | 40 | 12 | | | | 7 | 计算机网络 B | |
| | | 4120278141 | 云计算基础实验<br>Experiments on Cloud Computing | 1 | 32 | 32 | | | | 7 | 计算机网络 B | |
| | | 4120164110 | 行业应用软件设计与开发<br>Enterpriser Application Software Design & Development | 2 | 32 | 8 | | | | 7 | 软件开发工具 | |
| | | 4120004110 | Linux 软件分析与开发<br>Software Development on Linux | 2 | 32 | 8 | | | | 7 | 操作系统 | |
| | | 小 计 Subtotal | | 44 | 736 | 190 | 8 | | | | | |
| | | 修读说明：至少选修 19.5 学分<br>NOTE : select minimum subtotal credits, 19.5 | | | | | | | | | | |

## 五、集中性实践教学环节

## Ⅴ Practice Schedule

| 课程编号 Course Number | 实践环节名称 Practice Courses Name | 周数 Weeks | 学分 Crs | 建议修读学期 Suggested Term | 第二专业 Second Major |
|---|---|---|---|---|---|
| 1060002110 | 军事训练<br>Military Training | 3 | 1.5 | 1 | |
| 4120142110 | 专业教育<br>Introduction to Software Engineering Major | 1 | 1 | 3 | |
| 4100068110 | 电工电子实习 A<br>Practice in Electrical Engineering & Electronics A | 2 | 2 | 3 | |
| 4120152110 | 软件企业认知实习<br>Practice at Software Enterprisers | 3 | 3 | 5（企业） | |
| 4120294140 | 应用软件开发实训<br>Application Software Development Training | 2 | 2 | 6（企业） | |
| 4120295140 | 软件系统设计实训<br>Practice of Software System Project | 4 | 4 | 6（企业） | |
| 4120153110 | 职业教育<br>Occupation Education | 1 | 1 | 7（企业） | |
| 4120296140 | 企业级系统架构实训<br>Practice on Enterprise-level System Architecture | 6 | 6 | 7（企业） | |
| 4120110110 | 毕业设计<br>Bachelor Thesis | 17 | 11 | 8（企业） | |
| 小 计 Subtotal | | 39 | 31.5 | | |

## 六、修读指导

## Ⅵ Recommendations on Course Studies

1. 本专业课程设置方法参考 IEEE2001 SE 推荐的计算机科学优先方法，并按照自底向上的方法展开的软件工程类课程的学习，课程启动策略为程序设计优先方式。

本专业重要的学科大类基础课程和专业课程有：计算机科学导论、高级语言程序设计、离散结构、数据结构、计算机组成原理、操作系统、编译原理、数据库系统原理、计算机网络 A、软件工程导论、

软件需求工程、软件设计与体系结构、软件构件与中间件技术、软件项目管理、软件质量保证与测试、软件建模技术、软件开发工具、软件过程与 CMM。

2. 为体现本专业的专业特色与方向，本专业选修课程包括三个课群和一个工程实践课群:

智能软件与系统课群：人工智能概论、数据挖掘、Oracle 数据库技术；

嵌入式软件与系统课群：嵌入式系统、计算机接口技术、嵌入式应用软件开发、Linux 软件分析与开发；

网络软件与系统课群：信息安全、网络软件系统设计技术、XML 技术、网络软件编程技术；

工程实践课群：应用软件开发实训、软件系统设计实训、企业级系统架构实训；

1. The SE major program refers to IEEE 2001 SE which gives priority to computer science discipline and is formulated according to the bottom-to-up study strategy and programming-oriented course starting strategy.

The discipline courses and major courses of SE are: Introduction to Computer Science, Advanced Language Programming, Discrete structure, Data Structure, Principles of Computer Organization, Operating System, Compiler Theory, Principles of Database Systems, Computer Network, Introduction to Software Engineering, Software Requirements Engineering, Software Design and Architecture, Software Components and Middleware Technology, Software Project Management, Software Requirements Engineering, Software Testing, UML Modelling, Software Development Tools, Software Process and CMM.

2. The featured study field and directions are show in three tracks including specialized elective courses:

Track 1- Intelligent Software and System:

Introduction to Artificial Intelligence, Data Ming, Human-Computer Intelligent Interaction, Natural Language Processing, Digital Image Processing C;

Track 2- Embedded Software and System:

Embedded Operating System, Computer Interface Techniques, Embedded Development Tools, Embedded Application Software Development, Software Development on Linux;

Track 3 -Network Software and System:

Computer Security, Network Software System Design, XML Technology, Oracle Database, Technology of Network System Integration & Engineering;

Track 4- Engineering Practice:

Development Practice on Application Software, Practice on Software System Design, Practice on Enterprise-level System Architecture

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term. The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：袁景凌

专业培养方案责任人：刘东飞

# 【计算机科学与技术专业（卓越工程师）】
# 2014 版本科培养方案
# Undergraduate Program for Specialty in Computer Science and Technology (Excellent Engineer Pilot) (2014)

| | | | |
|---|---|---|---|
| 专业名称<br>Major | 计算机科学与技术<br>Computer Science and Technology | 主干学科<br>Major Disciplines | 计算机科学与技术<br>Computer Science and Technology |
| 计划学制<br>Duration | 四年<br>4 Years | 授予学位<br>Degree Granted | 工学学士<br>Bachelor of Engineering |
| 所属大类<br>Disciplinary | 计算机类<br>Computer Science and Technology | 大类培养年限<br>Duration | **1.5** 年<br>1.5 years |

**最低毕业学分规定**

**Graduation Credit Criteria**

| 课程类 Course Classification / 课程性质 Course Nature | 通识课程 Public Basic Courses | 学科大类课程 Basic Disciplinary Courses | 专业课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践 Practice Courses | 课外学分 Study Credit after Class | 总学分 Total Credits |
|---|---|---|---|---|---|---|---|
| 必修课 Required Courses | 36.5 | 46.5 | 37 | \ | 31.5 | \ | 190 |
| 选修课 Elective Courses | 9 | \ | 19.5 | \ | \ | 10 | |

## 一、培养目标与毕业要求

## Ⅰ Educational Objectives &Requirement

### （一） 培养目标

（1） 具有良好的职业道德、较强的社会责任感和追求卓越的态度，在科学研究、工程开发、应用实现中遵守法律法规；

（2） 具有坚实的数学基础、计算基础和工程基础，掌握与计算机科学与技术相关的基本科学方法，具有科学思维能力，能运用数学与自然科学基础知识解决实际问题；

（3） 系统地掌握计算机硬件、软件及计算机应用的基本理论和应用技术，具备扎实的项目实践能力和综合技术素质；

（4） 具有口头和书面表达能力，包括良好的英语运用能力，并能在团队中发挥作用；

（5） 具备一定的创新能力和通过继续教育或其它的终身学习途径拓展自己的能力，紧跟学科和专业发展。

（1） Have the strong sense of the ethics, social consciousness and responsibility , the pursuit of excellence in the profession, keep laws and regulations during research and development;

（2） Have the theoretical foundation of mathematics, computing and engineering, master the basic methodology concerned with computer science and technology including scientific thinking skills, the abilities in solving practical problems using mathematics and natural science knowledge;

（3） Master the fundamental theories and technologies, have the outstanding practice abilities

of researching and developing computer software and hardware;

（4） Have oral and written communication skills ,especially excellent communication skills in English, and play an appropriate role in teamwork;

（5） Have the innovation ability and self-improving ability by continuing education and other education methods to keep up with the cutting edge development of the profession.

**（二） 毕业要求**

（1） 掌握从事计算机科学与技术专业工作所需的数学、自然科学知识以及一定的经济学与管理学知识。

（2） 掌握计算机科学与技术专业基础理论与知识，理解本专业的基本概念、知识结构、典型方法，建立良好的科学、人文素养和工程意识。

（3） 掌握计算机系统分析和设计的基本方法，具有综合运用工程化的原理分析与解决实际问题的能力。

（4） 深入了解与本专业相关的职业和行业的法律、法规，理解并坚守诚实正直的职业道德准则。

（5） 具有遵循软件开发行业规范、运用开发平台开发实际项目及系统测试的能力。

（6） 了解计算机科学与技术及相关学科发展现状和趋势，并具有技术创新和产品创新初步能力。

（7） 具有终身学习意识，能够熟练地运用现代信息技术获取相关信息、新技术、新知识，并提升自我专业能力。

（8） 具有较强的团队协作能力、表达能力和人际交往能力，能在团队中发挥作用；

（9） 具有较强英语综合应用能力，在未来工作和社会交往中，能用英语有效地进行口头和书面的信息交流，具有一定的国际视野和跨文化交流、竞争与合作能力。

（1） Master the knowledge of computer science and technology in mathematics, natural science, economics and management.

（2） Master the basic theoretical and professional knowledge of computer science and technology and understand the related basic concepts, knowledge structure, and classic methods, construct the good science and humanity literacy and engineering viewpoint,

（3） Master the basic research methodology of computer-based system analysis and design, have the ability in applying engineering disciplines to analyse and solve practical problems.

（4） Deeply understand the professional laws, rules and policies, uphold the ethics of honesty and integrity.

（5） Have the abilities to comply with the norms and standards about the software development, and the ability of platform-based development including the integration and testing.

（6） Keep sense of the state of the art of computer science and related domain, have the basic ability in technical and products innovation.

（7） Have the ability in using information technology to obtain information, novelty technology and self-improving with a lifelong learning attitude.

（8） Have the strong ability in team collaboration, expression and interpersonal communication, and working independently.

（9） Have the ability of applying English language in study, can efficiently undertake oral and written information exchange in English in the future work, and have the international professional view for cross-culture communication, competition and collaboration.

附：培养目标实现矩阵

| | 培养目标 1 | 培养目标 2 | 培养目标 3 | 培养目标 4 | 培养目标 5 |
|---|---|---|---|---|---|
| 毕业要求 1 | ✓ | ✓ | | | |
| 毕业要求 2 | ✓ | ✓ | ✓ | | |
| 毕业要求 3 | | ✓ | ✓ | | |
| 毕业要求 4 | ✓ | | | | |
| 毕业要求 5 | | | ✓ | | |
| 毕业要求 6 | | | | | ✓ |
| 毕业要求 7 | | | | | ✓ |
| 毕业要求 8 | | ✓ | ✓ | ✓ | |
| 毕业要求 9 | | | | ✓ | |

## 二、专业核心课程与专业特色课程

## II Core Courses and Characteristic Courses

### （一） 专业核心课程：

离散结构、汇编语言程序设计、计算机组成原理、数据结构、操作系统、编译原理、数据库系统原理、计算机网络、高级语言程序设计、软件工程

Discrete structure, Assembly language programming, Principles of Computer Organization, Data Structure, Operating System, Principles of Compiler Construction, Principles of Database Systems, Computer Networks, Advanced Language Programming, and Software Engineering.

（二） **专业特色课程：**按照卓越工程师培养建议，与企业结合开展各类系统开发实训，包括系统软件开发实训、信息系统开发实训和嵌入式系统开发实训。

Characteristic Courses: Performing all kinds of system development practice and training in cooperation with enterprises based on the recommendation of Excellent Engineer Program.

附：毕业要求实现矩阵：

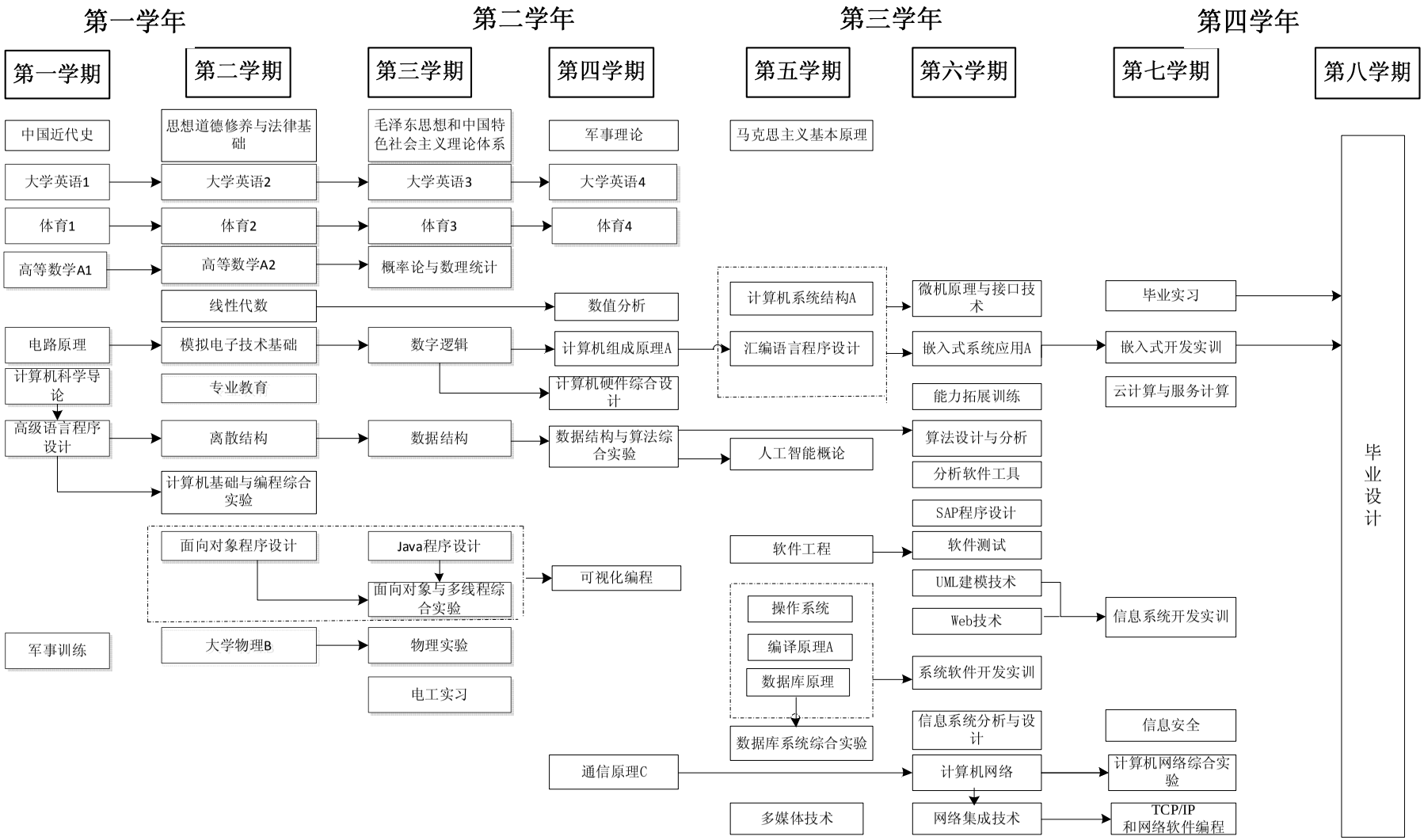
| 专业核心课程 | 专业特色课程 | 课程名称 | 计算机科学与技术专业(卓越工程师班)毕业要求 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | | 思想道德修养与法律基础 | | | | ✓ | | | | | |
| | | 中国近现代史纲要 | | ✓ | | | | | | | |
| | | 计算机科学导论 | ✓ | ✓ | | ✓ | | ✓ | ✓ | | |
| ✓ | | 高级语言程序设计 A | | ✓ | ✓ | | ✓ | | | | |
| | | 毛泽东思想和中国特色社会主义理论体系概论 | | ✓ | | | | | | | |
| | | 马克思主义基本原理 | | ✓ | | | | | | | |
| | | 军事理论 | | ✓ | | | | | | | |
| | | 体育 | | | | | | | ✓ | | |
| | | 大学英语 | | | | | | | | | ✓ |

| 专业核心课程 | 专业特色课程 | 课程名称 | 计算机科学与技术专业(卓越工程师班)毕业要求 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | | 高等数学 | ✓ | ✓ | | | | | | | |
| | | 电路原理 B | ✓ | ✓ | | | | | | ✓ | |
| | | 线性代数 | ✓ | ✓ | | | | | | | |
| | | 大学物理 B | ✓ | ✓ | | | | | | | |
| | | 物理实验 B | ✓ | ✓ | | | | | | | |
| ✓ | | 离散结构 | ✓ | ✓ | ✓ | | | | | | |
| | | 概率论与数理统计 B | ✓ | ✓ | | | | | | | |
| | | 电路分析基础 | ✓ | ✓ | | | | | | | |
| | | 模拟电子技术基础 C | ✓ | ✓ | | | | | | | |
| | | 计算机基础与编程综合 | | ✓ | ✓ | | ✓ | | ✓ | | |
| | | 面向对象程序设计 C | | ✓ | ✓ | | ✓ | | | | |
| | | 数字逻辑 | ✓ | ✓ | ✓ | | | | | | |
| ✓ | | 数据结构 | | | ✓ | ✓ | ✓ | | ✓ | | |
| | ✓ | JAVA 语言程序设计 B | | | ✓ | ✓ | | ✓ | | | |
| | | 计算机数值分析 | | ✓ | ✓ | | | | | ✓ | |
| | | 数据结构与算法综合实验 | | ✓ | ✓ | | ✓ | | ✓ | | |
| ✓ | | 计算机组成原理 A | | ✓ | ✓ | | ✓ | | | | |
| ✓ | | 汇编语言程序设计 | | ✓ | ✓ | | ✓ | | | | |
| ✓ | | 编译原理 A | | ✓ | ✓ | | ✓ | ✓ | | | |
| ✓ | | 操作系统 A | | ✓ | ✓ | | ✓ | ✓ | | | |
| ✓ | | 数据库系统原理 | | | ✓ | ✓ | ✓ | ✓ | | | |
| | | 数据库系统综合实验 | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| ✓ | | 软件工程 B | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | 嵌入式系统应用 A | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | 微机原理及接口技术 | | ✓ | ✓ | | ✓ | | | | |
| | | 计算机系统结构 | | ✓ | ✓ | | | | | | |
| ✓ | | 计算机网络 | | ✓ | ✓ | | | ✓ | | | |
| | | 计算机网络综合实验 | | ✓ | ✓ | | | | ✓ | ✓ | |

| 专业核心课程 | 专业特色课程 | 课程名称 | 计算机科学与技术专业(卓越工程师班)毕业要求 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | （1） | （2） | （3） | （4） | （5） | （6） | （7） | （8） | （9） |
| | | 人工智能概论 | | ✓ | ✓ | | ✓ | ✓ | | | |
| | | UML 建模技术 | | ✓ | ✓ | | ✓ | | | | ✓ |
| | | 网络集成技术 | | ✓ | ✓ | | | | | | |
| | | 信息安全 | | ✓ | ✓ | | | ✓ | | | |
| | | TCP/IP 和网络软件编程 | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | 多媒体技术 | | ✓ | ✓ | | | ✓ | | | |
| | | SAP 程序设计 | | ✓ | ✓ | | ✓ | | | | |
| | | 分析软件工具 | | ✓ | ✓ | | ✓ | | | | |
| | | 软件测试 B | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | 信息系统分析与设计 | | ✓ | ✓ | | ✓ | | | | |
| | | Web 技术 | | ✓ | ✓ | | ✓ | | | | |
| | ✓ | 可视化编程 | | ✓ | ✓ | | ✓ | | | | |
| | | 算法分析与设计 | | ✓ | ✓ | | | | | | |
| | | 通信原理 | ✓ | ✓ | ✓ | | | | | | |
| | | 云计算与服务计算 | | ✓ | ✓ | | | ✓ | | | |
| | | 军事训练 | ✓ | | | | | | | | |
| | | 专业教育 | | ✓ | | ✓ | | ✓ | ✓ | | |
| | | 电工电子实习 A | ✓ | ✓ | | | | | | | |
| | | 计算机硬件综合设计 | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| | | 系统软件开发实训(校企合作) | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| | | 能力拓展训练(课外进行) | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| | | 信息系统开发实训(校企合作) | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| | | 嵌入式系统开发实训(校企合作) | | ✓ | ✓ | | ✓ | | ✓ | ✓ | |
| | | 毕业实习 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | 毕业设计（论文） | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 三、课程教学进程图

## Ⅲ　Teaching Process Map


第一学年
第二学年
第三学年
第四学年
第一学期
第二学期
第三学期
第四学期
第五学期
第六学期
第七学期
第八学期
中国近代史
思想道德修养与法律基础
毛泽东思想和中国特色社会主义理论体系
军事理论
马克思主义基本原理
大学英语1
大学英语2
大学英语3
大学英语4
体育1
体育2
体育3
体育4
高等数学A1
高等数学A2
概率论与数理统计
线性代数
数值分析
计算机系统结构A
微机原理与接口技术
毕业实习
电路原理
模拟电子技术基础
数字逻辑
计算机组成原理A
汇编语言程序设计
嵌入式系统应用A
嵌入式开发实训
计算机科学导论
专业教育
计算机硬件综合设计
能力拓展训练
云计算与服务计算
高级语言程序设计
离散结构
数据结构
数据结构与算法综合实验
人工智能概论
算法设计与分析
分析软件工具
计算机基础与编程综合实验
SAP程序设计
面向对象程序设计
Java程序设计
软件工程
软件测试
可视化编程
面向对象与多线程综合实验
UML建模技术
Web技术
信息系统开发实训
操作系统
编译原理A
数据库原理
系统软件开发实训
军事训练
大学物理B
物理实验
电工实习
数据库系统综合实验
信息系统分析与设计
信息安全
通信原理C
计算机网络
计算机网络综合实验
多媒体技术
网络集成技术
TCP/IP
和网络软件编程
毕业设计

## 四、理论教学建议进程表

## Ⅳ Theory Course Schedule

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课程名称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 通识课程 Public Basic Courses | 必修课 Required Courses | 4220001111 | 思想道德修养与法律基础 Morals, Ethics and Fundamentals of Law | 3 | 48 | | | 8 | | 1-6 | | |
| | | 4220002111 | 中国近现代史纲要 Outline of Contemporary and Modern Chinese History | 2 | 32 | | | | | 1-6 | | |
| | | 4120027011 | 计算机科学导论 Introduction to Computer Science | 2.5 | 40 | 10 | | | | 1 | | |
| | | 4120020011 | 高级语言程序设计 A Advanced Language Programming A | 4 | 64 | 16 | | | | 1 | | |
| | | 4220003111 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Socialism with Chinese Characteristics | 4 | 96 | | | 32 | | 1-6 | | |
| | | 4220005111 | 马克思主义基本原理 Marxism Philosophy | 3 | 48 | | | 8 | | 1-6 | | |
| | | 1060001111 | 军事理论 Military Theory | 2 | 32 | | | 16 | | 2-4 | | |
| | | 4210001111 | 体育 1 Physical Education Ⅰ | 1 | 32 | | | | | 1 | | |
| | | 4210002111 | 体育 2 Physical Education Ⅱ | 1 | 32 | | | | | 2 | 体育 1 | |
| | | 4210003111 | 体育 3 Physical Education Ⅲ | 1 | 32 | | | | | 3 | 体育 2 | |
| | | 4210004111 | 体育 4 Physical Education Ⅳ | 1 | 32 | | | | | 4 | 体育 3 | |
| | | 4030002111 | 大学英语 A1 College English A Ⅰ | 3 | 64 | | | | 16 | 1 | | |
| | | 4030003111 | 大学英语 A2 College English A Ⅱ | 3 | 64 | | | | 16 | 2 | 大学英语 A1 | |
| | | 4030004111 | 大学英语 A3 College English A Ⅲ | 3 | 64 | | | | 16 | 3 | 大学英语 A2 | |
| | | 4030005111 | 大学英语 A4 College English A Ⅳ | 3 | 64 | | | | 16 | 4 | 大学英语 A3 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | 小 计 Subtotal | | 36.5 | 744 | 26 | | 64 | 64 | | | |
| | 选修课 Elective Courses | 创新创业类 Innovation and Entrepreneurship Courses | 全校学生要求至少取得 9 个学分，且必须选修艺术体育类课程中的艺术类相关课程，取得至少 2 个学分。理工科专业学生至少选修一门人文社科类或经济管理类课程，其他专业学生至少选修一门科学技术类课程。 All students are required to obtain at least 9 credits, and must select art courses from *Art and Physical Education Courses* to obtain at least 2 credits. Science and engineering students should select at least one course from *Arts and Social Science Courses* or *Economy and Management Courses*, and other students should select at least one course from *Science and Technology Courses*. | | | | | | | | | | |
| | | 人文社科类 Arts and Social Science Courses | | | | | | | | | | |
| | | 经济管理类 Economy and Management Courses | | | | | | | | | | |
| | | 科学技术类 Science and Technology Courses | | | | | | | | | | |
| | | 艺术体育类 Art and Physical Education Courses | | | | | | | | | | |

| 课程类别 Course Classification | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Operation | 实践 Practice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 学科大类课程 Basic Disciplinary Courses | 必修课 Required Courses | 4050063111 | 高等数学 A1<br>Advanced Mathematics A Ⅰ | 5 | 80 | | | | | 1 | | |
| | | 4050064111 | 高等数学 A2<br>Advanced Mathematics A Ⅱ | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4110019111 | 电路原理 B<br>Circuit Principle B | 4 | 64 | 16 | | | | 1 | | |
| | | 4050229111 | 线性代数<br>Linear Algebra | 2.5 | 40 | | | | | 2 | | |
| | | 4050463131 | 大学物理 B<br>Physics B | 5 | 80 | | | | | 2 | 高等数学 A1 | |
| | | 4050224111 | 物理实验 B<br>Physics Lab. B | 1 | 32 | 32 | | | | 3 | 大学物理 B | |
| | | 4120045111 | 离散结构<br>Discrete Structures | 4 | 64 | | | | | 2 | 计算机科学导论 | |
| | | 4050058111 | 概率论与数理统计 B<br>Probability and Mathematics Statistic B | 3 | 48 | | | | | 3 | 高等数学 A2 | |
| | | 4110050111 | 模拟电子技术基础 C<br>Analog Electronic Techniques C | 3 | 48 | 8 | | | | 3 | 高等数学 A2 | |
| | | 4120261141 | 计算机基础与编程综合实验<br>Experiments on Computer and Programming | 1 | 32 | 32 | | | | 2 | | |
| | | 4120048111 | 面向对象程序设计 C<br>Object-oriented Methodology | 2.5 | 40 | | 12 | | | 2 | 高级语言程序设计 A | |
| | | 4120263141 | 面向对象与多线程综合实验<br>Experiments on Object-oriented and Multithreading Programming | 1 | 32 | 32 | | | | 3 | | |
| | | 4120079111 | 数字逻辑<br>Digital Circuits | 3 | 48 | 8 | | | | 3 | 模拟电子技术基础 C | |
| | | 4120264141 | 数据结构 A<br>Data Structures A | 4 | 64 | | 16 | | | 3 | 高级语言程序设计 A | |
| | | 4120299141 | JAVA 语言程序设计 B<br>Java Programming B | 2.5 | 40 | | 8 | | | 3 | 高级语言程序设计 A | |
| | | 小计 Subtotal | | 46.5 | 792 | 128 | 36 | | | | | |
| 专业课程 Specialized Courses | 必修课 Required Courses | 4120028111 | 计算机数值分析<br>Computer Numerical Analysis | 2.5 | 40 | | 8 | | | 4 | 线性代数 | * |
| | | 4120265141 | 数据结构与算法综合实验<br>Experiments on Data Structure and Algorithm | 1 | 32 | 32 | | | | 4 | | * |
| | | 4120042111 | 计算机组成原理 A<br>Computer Organization A | 4.5 | 72 | 10 | | | | 4 | 数字逻辑 | * |
| | | 4120060111 | 软件工程 B<br>Introduction to Software Engineering | 2.5 | 40 | | 8 | | | 5 | | |
| | | 4120022111 | 汇编语言程序设计<br>Assembly Language Programming | 3 | 48 | 16 | | | | 5 | | |
| | | 4120159121 | 编译原理<br>Compiler Principles | 4 | 64 | | 12 | | | 5 | 高级语言程序设计 A | * |
| | | 4120161121 | 操作系统<br>Operating System | 4 | 64 | | 12 | | | 5 | 计算机组成原理 | |
| | | 4120268141 | 数据库系统原理<br>Principles of Database Systems | 3.5 | 56 | | 12 | | | 5 | 数据结构 | * |

| 课程类别 Course Classifi-cation | 课程性质 Course Nature | 课程编号 Course Number | 课 程 名 称 Course Title | 学分 Crs | 学时分配 Including 总学时 Tot hrs. | 实验 Exp. | 上机 Ope-ration | 实践 Prac-tice | 课外 Extra-cur | 建议修读学期 Suggested Term | 先修课程 Prerequisite Course | 第二专业 Second Major |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4120039111 | 计算机系统结构 A<br>Computer Architecture A | 2.5 | 40 | | | | | 5 | 计算机组成原理 | |
| | | 4120270141 | 数据库系统综合实验<br>Experiments on Database System | 1 | 32 | 32 | | | | 5 | | |
| | | 4120034111 | 计算机网络 C<br>Computer Networks C | 2.5 | 40 | | | | | 6 | | |
| | | 4120052111 | 嵌入式系统应用 A<br>Embedded System and Application A | 2.5 | 40 | 6 | | | | 6 | 汇编语言程序设计 | |
| | | 4120094111 | 微机原理及接口技术 B<br>Microcomputer and Interfacing B | 2.5 | 40 | 8 | | | | 6 | 计算机组成原理 | |
| | | 4120271141 | 计算机网络综合实验<br>Experiments on Computer Network | 1 | 32 | 32 | | | | 7 | 计算机网络 C | |
| | | 小 计 Subtotal | | 37 | 640 | 136 | 52 | | | | | |
| | 选修课 Elective Courses | 4120044111 | 可视化编程<br>Visual Programming | 2.5 | 40 | 10 | | | | 4 | | |
| | | 4120084111 | 通信原理 C<br>Communication Principles C | 2.5 | 40 | 8 | | | | 4 | | |
| | | 4120055111 | 人工智能概论<br>Artificial Intelligence | 2 | 32 | | | | | 5 | | |
| | | 4120018111 | 多媒体技术<br>Multimedia Technology | 2 | 32 | 6 | | | | 5 | | |
| | | 4120008111 | UML 建模技术<br>UML Modeling Technology | 2 | 32 | | | | | 6 | 软件工程 B | |
| | | 4120087111 | 网络集成技术<br>Network Integration Technology | 2 | 32 | 6 | | | | 6 | 计算机网络 C | |
| | | 4120197131 | SAP 程序设计<br>SAP Programming | 4 | 64 | | | 16 | | 6 | 数据库系统原理 | |
| | | 4120019111 | 分析软件工具<br>Analysis Software Tool | 2 | 32 | | 8 | | | 6 | | |
| | | 4120058111 | 软件测试 B<br>Software Testing B | 2 | 32 | 8 | | | | 6 | 软件工程 B | |
| | | 4120103111 | 信息系统分析与设计<br>Information System Analysis and Design | 2 | 32 | 6 | | | | 6 | 数据库系统原理 | |
| | | 4120009111 | Web 技术<br>Web Technology | 2 | 32 | | 6 | | | 6 | | |
| | | 4120081111 | 算法设计与分析 A<br>Algorithm Design and Analysis A | 2.5 | 40 | | 8 | | | 6 | 数据结构 | |
| | | 4120102111 | 信息安全<br>Information Security | 2 | 32 | 6 | | | | 7 | | |
| | | 4120006111 | TCP/IP 和网络软件编程<br>TCP/IP and Network Programing | 2.5 | 40 | | 10 | | | 7 | 计算机网络 C | |
| | | 4120083111 | 云计算与服务计算<br>Cloud & Service Computing | 2 | 32 | 6 | | | | 7 | | |
| | | 小 计 Subtotal | | 34 | 544 | 56 | 32 | 16 | | | | |
| | | 修读说明：要求至少选修 19.5 学分。<br>NOTE：Minimum subtotal credits: 19.5. | | | | | | | | | | |

## 五、集中性实践教学环节

## Ⅴ Practice Schedule

| 课程编号<br>Course Number | 实践环节名称<br>Practice Courses Name | 周数<br>Weeks | 学分<br>Crs | 建议修读学期<br>Suggested Term |
|---|---|---|---|---|
| 1060002111 | 军事训练<br>Military Training | 3 | 1.5 | 1 |
| 4120141111 | 专业教育<br>Professional Education | 1 | 1 | 3 |
| 4100068111 | 电工电子实习 A<br>Practice in Electrical Engineering & Electronics A | 2 | 2 | 3 |
| 4120206131 | 计算机硬件综合设计<br>Computer Hardware Integrated Course Project | 2 | 2 | 4 |
| 41201391111 | 系统软件开发实训<br>System Software Development Practise and training | 2 | 2 | 5(校企合作) |
| 41201271111 | 能力拓展训练<br>Ability Development Training | 1 | 1 | 6(暑期) |
| 41201401111 | 信息系统开发实训<br>Information System Practise and Training | 4 | 4 | 7(校企合作) |
| 4120130111 | 嵌入式系统开发实训<br>Embeded System Practise and Training | 4 | 4 | 7(校企合作) |
| 4120113111 | 毕业实习<br>Practical Training for Graduation | 3 | 3 | 7 |
| 4120184121 | 毕业设计<br>Graduation Design (Thesis) | 17 | 11 | 8 |
| 小　　计　Subtotal | | 39 | 31.5 | |

## 六、修读指导

## Ⅵ Recommendations on Course Studies

《形势与政策》课程，平均每学期 16 学时，一般按专题进行，在第七学期末考核，计 2 个课外学分，具体由学校学生发展指导中心负责组织落实。

Situation & Policy, a 16 hours/term with 2 credits course, is taught according to topics and tested at the end of the 7th term . The course will be arranged by the University Students' Affairs' Department in each school.

学院教学责任人：袁景凌

专业培养方案责任人：彭德巍