**软件工程（卓越班）**

**Software Engineering（Excellent Engineer Class）**

**Major Code：**080902

**Period of Schooling：**4年

**Granted Degree：**Bachelor of Engineering

**Major Introduction：**The School of Software Engineering is the first batch of national demonstration software colleges approved by the Ministry of Education in 2001. The school adheres to the teaching idea of "New Mechanism for Operation, New Pattern for Training; Intensive Engineering Training, Close Cooperation with Enterprise , Achieve International Integration; Cultivate comprehensive elites with good foundation, strong ability, excellent English and collaborative ability for software research and development", and is committed to cultivate high-level international software elites. The college has the "National Experimental Zone of Innovation Model to Cultivate Software Talent", the first batch of "Excellent Engineer Education Program" pilot majors of the Ministry of Education, the "National Engineering Practice Education Center" and the "Comprehensive Reform for Undergraduate" pilot majors of the Ministry of Education, the "Experimental Zone of Innovation Model to Cultivate Software Talent" of Guangdong Province, and the "Comprehensive Reform for Undergraduate" pilot majors of Guangdong Province. This training program focuses on the cultivation of engineering talents, and strengthens the spirit and ability of innovation through innovative teaching methods, outstanding practice links and introduction of corporate project training.

**一、学分统计表（Credits Registration Form）**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 课程类别  Course Category | 课程要求  Requirement | 学分  Credits | 学时  Academic Hours | 备注  Remarks |
| 公共基础课  General Basic Courses | 必修  Compulsory | 63.5 | 988 |  |
| 通识  General Education | 10.0 | 160 |  |
| 学科基础课  Disciplinary Basic Courses | 必修  Compulsory | 37.0 | 672 |  |
| 选修  Elective | 0 | 0 |  |
| 专业领域课  Specialty- related Courses | 必修  Compulsory | 7.0 | 128 |  |
| 选修  Elective | 29.5 | 352 | Part of the courses is are Practice Training |
| 合计  Total | | 147.0 | 2300 |  |
| 集中实践教学环节（周）  Practice Training (Weeks) | 必修 | 32.0 | 48周 |  |
| 毕业学分要求  Credits Required for Graduation | 147.0+32.0=179.0 | | | |

Remark: The requirements for the Master's degree program and the qualifications for graduation are carried out in accordance with the Master's program developed by the students, and the courses and business internships are under the guidance of the university's instructors and business instructors. Students must also obtain 2 humanistic quality education credits and 4 innovation ability training credits in Second Courses while obtaining the credits specified in specialized teaching plan.

**二、专业教学计划表（Teaching Schedule）**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别**  Course Category | **课 程**  **代 码**  Course No. | **课程名称**  Course Title | **是否必修**  C/E | **学时数**  Total Curriculum Hours | | | | **学分数**  Credits | **开课**  **学期**  Semester | **毕业**  **要求**  Student Outcomes |
| **总学时**  Class Hours | **上机**  Computer-aided Class Hours | **实验**  Lab Hours | **实践**  Practice Hours |
| **公 共 基 础 课General Basic Courses** | 143091 | 中国近现代史纲要  Skeleton of Chinese Modern History |  | （32）24 |  |  |  | 2.0 | 1 | №8 |
| 144001 | 大学英语（一）  College English(1) | 必修课  C | 64 |  |  |  | 4.0 | 1 | №10 |
| 152001 | 体育（一）  Physical Education (1) | 32 |  |  | 32 | 1.0 | 1 | №12 |
| 140195 | 数学分析（一）  Mathematics Analysis(1) | 80 |  |  |  | 5.0 | 1 | №1,2 |
| 140197 | 线性代数  Linear Algebra | 48 |  |  |  | 3.0 | 1 | №1,2 |
| 155011 | 高级语言程序设计（C++）（上）  Advanced Language Program Design in C++ Ⅰ | 64 | 16 |  |  | 3.5 | 1 | №1,5 |
| 130009 | 工程制图  Engineering Drawing | 48 |  |  |  | 3.0 | 1 | №1,2,5 |
| 143093 | 思想道德修养与法律基础  Cultivation of Thought and Morals & Fundamental of Law | （40）  （36） |  |  |  | 2.5 | 2 | №8 |
| 144002 | 大学英语（二）  College English(2) | 64 |  |  |  | 4.0 | 2 | №10 |
| 152002 | 体育（二）  Physical Education (2) | 32 |  |  | 32 | 1.0 | 2 | №12 |
| 106001 | 军事理论  Military Principle | （16） |  |  |  | 1.0 | 2 | №9 |
| 140196 | 数学分析（二）  Mathematics Analysis(2) | 112 |  |  |  | 7.0 | 2 | №1,2 |
| 141005 | 大学物理Ⅲ（一）  General Physics (1) | 64 |  |  |  | 4.0 | 2 | №1,2 |
| 141007 | 大学物理实验（一）  Physics Experiment(1) | 32 |  | 32 |  | 1.0 | 2 | №1,2 |
| 140019 | 概率论与数理统计  Probability & Mathematical Statistics | 48 |  |  |  | 3.0 | 2 | №1,2 |
| 155012 | 高级语言程序设计（C++）（下）  Advanced Language Program Design in C++ Ⅱ | 32 | 8 |  |  | 2.0 | 2 | №1,5 |
| 152003 | 体育（三）  Physical Education (3) | 32 |  |  | 32 | 1.0 | 3 | №12 |
| 143090 | 马克思主义基本原理  Fundamentals of Marxism Principle | （40）  36 |  |  |  | 2.5 | 3 | №8 |
| 141006 | 大学物理Ⅲ（二）  General Physics (2) | 64 |  |  |  | 4.0 | 3 | №1,2 |
| 141008 | 大学物理实验（二）  Physics Experiment(2) | 32 |  | 32 |  | 1.0 | 3 | №1,2 |
| 143106 | 毛泽东思想和中国特色社会主义理论体系概论  Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics | (80)  48 |  |  |  | 5.0 | 4 | №8 |
| 152004 | 体育（四）  Physical Education (4) | 32 |  |  |  | 1.0 | 4 | №12 |
| 143094 | 形势与政策  Analysis of the Situation & Policy | (128) |  |  |  | 2.0 | 1-8 | №8 |
|  | 人文科学领域  Humanities | 通  识  课  E | 96 |  |  |  | 6.0 |  | №8 |
|  | 社会科学领域  Social Science | 64 |  |  |  | 4.0 |  | №8 |
| **合计**  **Total** | | | 1148 | 24 | 64 | 128 | 73.5 |  |  |

**三、专业教学计划表（续）（Teaching Schedule）**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别**  Course Category | **课 程**  **代 码**  Course No. | **课程名称**  Course Title | **是否必修**  C/E | **学时数**  Total Curriculum Hours | | | | **学分数**  Credits | **开课**  **学期**  Semester | **毕业**  **要求**  Student Outcomes |
| **总学时**  Class Hours | **上机**  Computer-aided Class Hours | **实验**  Lab Hours | **实践**  Practice |
| **学科基础课Disciplinary Basic Courses** | 155290 | 计算机与软件工程概论  Introduction to Computer & Software Engineering | C | 32 |  |  |  | 2.0 | 1 | №1 |
| 135003 | 电路与电子技术  Electric Circuit and Electronics | C | 64 |  |  |  | 4.0 | 2 | №2,3 |
| 155172 | 数字逻辑  Digital Circuits and Logic Design | C | 48 |  | 16 |  | 2.5 | 2 | №2,3 |
| 155320 | C++程序开发实训  C++ program development Training | C | 5 weeks |  |  |  | 5.0 | 2\* | №2,3,5,9, 11 |
| 135037 | 电路与电子技术实验  Experiment of Electric Circuit and Electronics | C | 32 |  | 32 |  | 1.0 | 3 | №1,2,3 |
| 155231 | 离散数学  Discrete Mathematics | C | 64 |  |  |  | 4.0 | 3 | №1,2 |
| 155141 | 计算机组成与体系结构  Computer Organization & Architecture | C | 64 |  | 16 |  | 3.5 | 3 | №2,3,4 |
| 155016 | 数据结构  Data Structure | C | 64 |  | 16 |  | 3.5 | 3 | №3,4 |
| 155189 | 操作系统  Operating System | C | 64 |  | 16 |  | 3.5 | 3 | №3,4,5 |
| 155174 | 编译技术  Principle of Compiler | C | 48 |  | 16 |  | 2.5 | 4 | №3,4,5 |
| 155021 | 计算机网络  Computer Network | C | 64 |  | 16 |  | 3.5 | 4 | №3,4,5 |
| 155147 | 数据库系统  Database System | C | 64 |  | 16 |  | 3.5 | 4 | №3,4,5 |
| 155321 | 软件分析设计与建模  Analysis Design and Modeling of Software Requirement | C | 64 |  | 16 |  | 3.5 | 4 | №2,3,5 |
| 155319 | 数据库开发实训\*\*  Database Experiment and Training | E | 5 weeks |  |  |  | 5.0 | 4\* | №2,3,5,9, 11 |
| 155349 | 软件开发综合实训\*\*  Software Development and Comprehensive Training | E | 5 weeks |  |  |  | 5.0 | 4\* | №2,3,5,9, 11 |
| **合　计**  **Total** | | 必  C | 672 | 112 | 48 |  | 37.0 |  |  |
| **专业领域课 Specialty Courses** | 155381 | 软件工程学科前沿研讨  Frontiers of Software Engineering | E | 32 |  |  |  | 2.0 | 1 | №3,7,12 |
| 155388 | 基于机器人编程的计算机科学导论  Introduction to Computer Science with Robotics Experiments | E | 32 |  | 16 |  | 1.5 | 1 | №1,2,3,5,10 |
| 155058 | Java语言程序设计  Programming in Java | E | 40 | 16 |  |  | 2.0 | 3 | №1,5 |
| 155315 | 软件项目管理  Software Project Management | C | 64 | 16 |  |  | 3.5 | 5 | №2,3,5,67,11 |
| 155324 | 软件测试与维护  Software Testing and maintenance | C | 64 | 16 |  |  | 3.5 | 5 | №5,6,7 |
| 155306 | 软件体系结构  Software Architecture | E | 64 | 16 |  |  | 3.5 | 5 | №2,3,4,5,6,7 |
| 155344 | 算法设计与分析  Algorithm design and analysis | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155382 | 软件工程经济学  Software Engineering Economics | E | 48 | 16 |  |  | 2.5 | 6 | №1,2 |
| 155391 | 图像处理基础  Fundamentals of Image Processing | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155326 | 人工智能1(1)）  Artificial Intelligence | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155387 | 机器学习1(2)  Machine Leaning | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155165 | 数据挖掘1(3)  Data mining | E | 40 | 16 |  |  | 2 | 5 | №1,2,3,4,5 |
| 155392 | 机器视觉1(4)  Machine Vision | E | 32 |  |  |  | 2.0 | 6 | №1,2,3,4,5 |
| 155393 | 大数据开发实训1(5)  Large data development training | E | 6 weeks |  |  |  | 6.0 | 6\* | №1,2,3,4,5,9,11 |
| 155394 | 机器人编程基础2(1)  Basics Programming of Robot | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155395 | 物联网基础与应用2(2)  Foundation and Application of Internet of Things | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,6,7 |
| 155396 | 嵌入式软件优化技术2(3)  Embedded Software Optimization Technology | E | 48 | 16 |  |  | 2.5 | 6 | №1,2,3,4,5 |
| 155352 | 嵌入式软件项目实训2(4)  Embedded software project training | E | 6 weeks |  |  | 6 weeks | 6.0 | 6\* | №1,2,3,4,5,9,11 |
| 155152 | 计算机图形学3(1)  Computer Graphics | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155336 | 计算机视觉3(2)  computer vision | E | 48 |  |  | 16 | 2.5 | 6 | №1,2,3,4,5 |
| 155341 | 3D游戏引擎架构设计基础3(3)  Foundation of 3D Game Engine Architecture Design | E | 48 | 16 |  |  | 2.5 | 6 | №1,2,3,4,5 |
| 155397 | 自然语言处理3(4)  Natural Language Processing | E | 48 | 16 |  |  | 2.5 | 6 | №1,2,3,4,5 |
| 155345 | 数字媒体开发实训3(5)  Digital Media development Training | E | 6 weeks |  |  | 6 weeks | 6.0 | 6\* | №1,2,3,4,5,9,11 |
| 155398 | IOS平台应用开发4(1)  Developing apps for iOS | E | 48 | 16 |  |  | 2.5 | 5 | №2,3,4,5 |
| 155389 | Android程序设计与开发4(2)  Android Programming and Development | E | 48 | 16 |  |  | 2.5 | 5 | №2,3,4,5 |
| 155342 | 智能人机交互4(3)  Intelligent human-machine interact | E | 48 | 16 |  |  | 2.5 | 5 | №1,2,3,4,5 |
| 155346 | 移动计算及软件开发实训4(4)  Development Technical Training of Mobile Computing and software | E | 6 weeks |  |  | 6 weeks | 6.0 | 6\* | №1,2,3,4,5,9,11 |
| 155327 | WEB服务与面向服务的体系结构  Web Services and SOA | E | 48 | 16 |  |  | 2.5 | 5 | №2,3,4,5 |
| 155374 | 并行程序设计 Designing of parallel program | E | 40 |  | 16 |  | 2.0 | 6 | №2,3,4,5 |
| 155334 | Java EE分布式架构  Java EE Distributed Architecture | E | 32 |  |  |  | 2.0 | 6 | №2,3,4,5 |
| 155160 | 电子商务  Electronic Commerce | E | 40 | 16 |  |  | 2.0 | 6 | №1,2,3,5 |
| 145042 | 信息系统安全  Information system security | E | 32 | 16 |  |  | 1.5 | 6 | №2,3,4,5,6,8 |
| 155377 | 计算思维  Computational thinking | E | 32 | 8 |  |  | 2.0 | 4 | №2,3,4 |
| 155399 | 区块链技术与应用  Block chain technology and application | E | 32 | 16 |  |  | 1.5 | 4 | №2,3,4,5 |
| 155400 | 云计算应用与开发  Cloud computing application and development | E | 32 | 16 |  |  | 1.5 | 4 | №2,3,4,5 |
| 155338 | Java EE 软件开发项目实训  Java EE software development training | E | 6 weeks |  |  | 6 weeks | 6.0 | 6\* | №1,2,3,4,5,9,11 |
| 155362 | 企业软件项目实训  Enterprise software project Training | E | 6 weeks |  |  | 6 weeks | 6.0 | 6\* | №1,2,3,4,5,9,10,11 |
| **合　计**  **Total** | | 必  C | 128 | 32 |  |  | 7.0 |  |  |
| 选  E | 与集中实践教学环节中选修课一起修读最低要求29.5学分（按方向修读）  minimum elective course credits required:29.5 | | | | | | |

Remark: 1. Courses with superscripts such as  1(1) are in the specialized direction field, where number outside the brackets indicate the number of the courses group in direction filed (1 is for filed of Big Data; 2 is for field of Embedded System and Software; 3 is for filed of Digital Media; 4 is for Mobile Computing and Software). The number in parentheses is the serial number of the course in the courses group corresponding to the direction field. Students must complete all courses included at least in one direction filed. 2. Courses with "\*" are not set up until 14 weeks after the start of the semester. 3. Courses With "\*\*" stand for one of the two must be selected. 4. Training courses are not included in this column, but included in the Practice-concentrated Training.

**四、集中实践教学环节(Practice-concentrated Training)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **课程**  **代码**  Course No | **课程名称**  Course Title | **是否必修**  C/E | **学时数**  Total Curriculum Hours | | **学分数**  Credits | **开课**  **学期**  Semester | **毕业要求**  Student Outcomes |
| **实践**  Practice  weeks | **授课**  Lecture Hours |
| 106002 | 军训  Military Training | C | 3 weeks |  | 3.0 | 1 | №12 |
| 143197 | 马克思主义理论与实践  Marxism Theory and Practice | C | 2 weeks |  | 2.0 | Holiday | №8 |
| 155357 | 数字系统创意设计  Digital system creative design | E | 3 weeks |  | 3.0 | 1 | №2,3 |
| 155320 | C++程序开发实训  C++ program development Training | C | 5 weeks |  | 5.0 | 2\* | №2,3,5,9,11 | |
| 141073 | 电子工艺实习Ⅱ  Practice of Electronic | C | 2 weeks |  | 2.0 | 4 | №1,2,3 | |
| 155319 | 数据库开发实训\*\*  Database development Training | E | 5 weeks |  | 5.0 | 4\* | №2,3,5,9,11 | |
| 155349 | 软件开发综合实训\*\*  Software development and comprehensive training | E | 5 weeks |  | 5.0 | 4\* | №2,3,5,9,11 | |
| 155393 | 大数据开发实训1(5)  Large data development training | E | 6 weeks |  | 6.0 | 6\* | №1,2,3,4,5,9,11 | |
| 155352 | 嵌入式软件项目实训2(4)  Embedded software project training | E | 6 weeks |  | 6.0 | 6\* | №1,2,3,4,5,9,11 | |
| 155345 | 数字媒体开发实训3(5)  Digital Media development Training | E | 6 weeks |  | 6.0 | 6\* | №1,2,3,4,5,9,11 | |
| 155346 | 移动计算及软件开发实训4(4)  Development Technical Training of Mobile Computing and software | E | 6 weeks |  | 6.0 | 6\* | №1,2,3,4,5,9,11 | |
| 155338 | Java EE 软件开发项目实训  Java EE software development training | E | 6 weeks |  | 6.0 | 6 weeks | №1,2,3,4,5,9,11 | |
| 155362 | 企业软件项目实训  Enterprise software project Training | E | 6 weeks |  | 6.0 | 6\* | №1,2,3,4,5,9,10,11 | |
| 155075 | 毕业实习  Practice on Diploma Project | C | 16 weeks |  | 5.0 | 7 | №1,2,3,4,5,9,10,11 | |
| 155076 | 毕业设计  Diploma Project | C | 15 weeks |  | 15.0 | 8 | №1,2,3,4,5,9,10,11 | |
| **合　计**  **Total** | | 必  C | 48 |  | 32.0 |  |  |
| 选  E | 与专业领域课中选修课一起修读最低要求29.5学分（按方向修读）  minimum elective course credits required:29.5 | | | | |

**五、第二课堂(Second Courses)**

Second Courses consists of two parts: humanistic quality education and innovation ability training.

**1.Basic Requirements for Humanistic Quality Education**

While obtaining the credits required by the specialized teaching plan, students should also participate in the extracurricular humanities quality education activities in accordance with their own interests. The accumulated credits for the activities should be not less than 2 credits.

**2.Basic Requirements for Innovation Ability Training**

Students must also participate in the National Innovation and Entrepreneurship Training Program or the Guangdong Innovation and Entrepreneurship Training Program or the SRP (Student Research Program) or the 100-step ladder climbing program or the various types of extracurricular innovation ability training (such as academic competitions, academic lectures, etc.) for a certain period of time. The total number of credits for participating in the activity should be not less than 4 credits.