

集成电路设计与集成系统2022版本本科培养方案

Undergraduate Education Plan for Specialty in Integrated Circuit Design and Integrated System (2022)

| | |
|--|---|
| 专业名称 集成电路设计与集成系统 Major Integrated Circuit Design and Integrated System 计划学制 四年 Duration 4 Years 所属大类 电子信息类 Disciplinary Electronics | 主学科 电子科学与技术 Major Disciplines Electronic Science and Technology 授予学位 工学学士 Degree Granted Bachelor of Engineering 大类培养年限 1年 Duration 1 year |
|--|---|

最低毕业学分规定

Graduation Credit Criteria

| 课程分类 Course Classification 课程性质 Course Nature | 公共基础课程 Public Basic Courses | 通识教育课程 Public Courses | 大类课程 Basic Courses in General Discipline | 专业教育课程 Specialized Courses | 个性课程 Personalized Course | 集中性实践教学环节 Specialized Practice Schedule | | 课外学分 Study Credit after Class | 总学分 Total Credits |
|--|--------------------------------|--------------------------|--|-------------------------------|-----------------------------|--|----------|----------------------------------|----------------------|
| | | | | | | Specialized Practice | Schedule | | |
| 必修课 Required Courses | 31 | \ | 43.5 | 24 | \ | 21.5 | | 10 | 180.0 |
| 选修课 Elective Courses | \ | 9 | \ | 25 | 6 | \ | | 10 | |

一、培养目标与毕业要求

I Educational Objectives & Requirement

(一) 培养目标

本专业将培养德、智、体、美、劳全面发展的社会主义建设者和接班人，培养具有集成电路设计与集成系统领域系统、扎实的理论基础，胜任集成电路设计与集成系统领域的研究、开发、制造及管理工作，适应能力强、实干精神强、创新意识强和具有卓越追求、卓越能力的卓越专业人才。

本专业期待毕业生五年后能达成下列目标：

- (1) 具有良好的品德、人文素养和身体素质，熟知当代全球的突出社会问题和道德问题；
- (2) 具有集成电路设计与集成系统专业扎实的自然科学基础，能熟练运用数学和科学工具解决专业领域内的各种常见工程问题；
- (3) 能卓越的承担集成电路设计与集成系统专业领域的研究、开发、制造及管理工作；
- (4) 具备对集成电路学科发展趋势的高度敏感性，具有较强的创新意识以及跟踪掌握本专业新理论、新知识、新技术的卓越能力。
- (5) 具有优异的口头和书面的沟通技能、良好的团队意识和合作精神，具有卓越的自我管理能力和终身学习能力和职业提升能力。

I Education Objectives

This program is designed to cultivate socialist builders and successors with all-round development of morality, intelligence, physical education, beauty and labor. The plan is designed to produce excellent professionals with systematic and solid theoretical foundation in the field of integrated circuit design and integrated system, competent for research, development, manufacturing and management in the field of integrated circuit design and integrated system, with strong adaptability, practical spirit, strong sense of innovation, excellent pursuit and excellent ability.

Students of this program are expected to achieve the following objectives 5 years after graduation:

- (1) Comply with professional ethics, cultural scientific literacy, social responsibility and physical quality, and the students shall be familiar with the prominent social issues and moral issues in the contemporary world.
- (2) Know well about mathematics and nature science related to integrated circuit design and integrated system, research, engineering design and technology service. The students shall be able to skillfully to solve various common engineering issues in the professional field by using mathematical and scientific tools.
- (3) Be excellent in research, development, manufacture and management in integrated circuit design and integrated system professional.
- (4) Has high sensitivity to the development trends of integrated circuit. The students with strong innovation consciousness shall be able to excellent continuously grasp new theories, and master new knowledge and new techniques in electronics.
- (5) Have excellent capacities of verbal and written communication, teamwork and cooperative. Own excellent abilities of self-management, lifelong learning, and engaged in the professional enterprise.

二、毕业要求

- (1) 工程知识：能够运用数学、自然科学、工程基础和集成电路设计与集成系统专业知识，将集成电路设计与集成系统专业复杂工程问题抽象为数学、物理问题，选择适当的模型进行描述，对模型进行分析求解。
- (2) 问题分析：能够对集成电路设计与集成系统中的复杂工程问题进行识别和明确表达，通过文献研究及分析、模型构建及分析，最终形成有效的结论。
- (3) 解决方案：能够综合考虑经济、社会、健康、安全、法律、文化及环境因素，针对集成电路设计与集成系统复杂工程问题提出有效的解决方案，能够设计出满足一定需求条件的集成电路设计与集成系统模块，在设计过程中体现创新意识，对设计的系统进行功能测试、性能测试，并改进方案。

- (4) 研究：能够针对集成电路设计与集成系统工程中的复杂问题，包括设计性实验及综合专题研究等环节中的相关数据，基于相关科学原理进行研究，通过收集信息、查阅文献、仿真分析、硬件调试实验等科学方法，分析数据并综合信息，最终给出有效的结论。
- (5) 工具使用：针对集成电路设计与集成系统复杂工程问题，能够选择与使用适合的现代工具和已有的技术资源，对问题进行预测和模拟，并在使用这些工具和技术资源过程中，理解其应用的局限性。
- (6) 工程与社会：能够基于工程相关背景知识进行合理分析，评价专业工程实践和集成电路复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。
- (7) 环境和可持续发展：能够理解和评价针对集成电路复杂工程问题的工程实践对环境、社会可持续发展的影响。
- (8) 职业规范：具有人文社会科学素养、身体素质、心理素质、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。
- (9) 个人和团队：具有协作精神和团队意识，能够在多学科背景下的团队中担任负责人或普通成员，并承担相应的责任，共同完成团队任务。
- (10) 沟通：能够就集成电路复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。
- (11) 项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。
- (12) 终身学习：具有自主学习能力，具有较强的自我管理和控制能力，理解在集成电路领域及未来职业发展过程中终身学习的重要性，具有基于职业发展需求不断学习和发展的能力。

II Graduation Requirement

- (1) Engineering knowledge: Have the ability to abstract the complex engineering problems of integrated circuit design and integrated system into mathematical and physical problems, select the appropriate model to describe and analyze with mathematics, natural science, engineering foundation and integrated circuit design and integrated system knowledge.
- (2) Problem analysis: Have the capacity to recognition and express clearly the complex engineering problems belongs to integrated circuit design and integrated system
- (3) Design/development solution: Offer an effective solution to the complex engineering problems of integrated circuit design and integrated system by considering economic, social, health, safety, legal, cultural and environmental factors synthetically. Have the capacity to design integrated circuit modules that meet certain requirements. Be able to test the function and performance of the design system, further more have the ability to improve the solution and show a sense innovation in design procedure
- (4) Research: Have the ability to solve the complex problems in integrated circuit design and integrated system, including related data in design experiments and comprehensive thematic studies. Doing some research based on the related science principles, and through collecting information, consulting documents, simulation analysis, hardware debugging experiments etc. scientific methods to analyze data and integrated information, finally give an effective conclusion.
- (5) Usage of modern tools: To solve the complex problems in integrated circuit design and integrated system, select or use suitable modern tools and existing technology to make a prediction and simulation of the problem, meanwhile understand the limitations of the application.
- (6) Engineering and society: Make reasonable analysis based on related engineering background knowledge, evaluate the impact of professional engineering practice and complex integrated circuit engineering solutions to social, health, safety, legal and cultural, and under the responsibility.
- (7) Environment and sustainable development: understand and assess the impact of professional engineering practice and complex integrated circuit engineering to environment, sustainable development of society
- (8) Professional standards: Possess humanities and social science literacy, physical quality, psychological quality and social responsibility. Be able to understand and comply with engineering occupation ethics in engineering practice, and show responsibility
- (9) Individual and team: possess cooperation spirit and team spirit, to be a leader or a member in a team with a multidisciplinary background, assume the corresponding responsibility and complete the task together.
- (10) Communication: Have an effectively communicate with industry counterparts and the public about complex integrated circuit engineering problem, including write a report, design a manuscript, make a statement, clear express or response instruction. Possess a certain international vision, communicate with each other in a cross-cultural background.
- (11) Project management: Understand and master the principle of engineering management and the method of economic decision. Applying in a multidisciplinary environment is the most important.
- (12) Life-long learning: Have the capacity to learn by oneself, self-management and self-control. Understanding the importance of lifelong learning in integrated circuit field and future professional development.

表2 培养目标的矩阵关系毕业要求支撑

| 毕业要求 | 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 | | √ | | √ | √ |
| 毕业要求12 | | | | √ | √ |

毕业要求的达成需以课程（教学环节）的教学活动为支撑。本专业为合理设置课程体系、落实对毕业要求的支撑课程，对各项毕业要求进行了解。每项毕业要求（一级指标）被分解为若干层递进的指标点（二级指标），前一指标点的达成是下一指标点达成的基础，而下一指标点的达成是前一指标点的升华，所有指标点一起，支撑了该毕业要求的达成。根据上述分解方法，本专业各项毕业要求的指标点分解如下表所示。

表3 毕业要求指标点的分解

| 毕业要求 | 指标点 |
|--|---|
| 毕业要求1.工程知识:能够运用数学、自然科学、工程基础和集成电路设计与集成系统专业知识,将集成电路设计与集成系统专业复杂工程问题抽象为数学、物理问题,选择适当的模型进行描述,对模型进行分析求解。 | 1.1掌握数学、物理等自然科学知识。掌握集成电路设计与集成系统的专业基础知识。针对集成电路设计与集成系统领域的复杂工程问题进行表述。 |
| | 1.2将集成电路设计与集成系统领域的复杂工程问题抽象为数学、物理问题,建立相应的数学或物理模型,并对模型进行求解。 |
| | 1.3对集成电路设计与集成系统领域的复杂工程问题抽象提炼出的数学或物理模型,进行推演分析。 |
| | 1.4将复杂工程问题抽象为数学、物理问题,选择适当的模型进行描述,对模型进行推理求解,比较综合和必要修正,并理解其局限性。 |
| 毕业要求2.问题分析:能够对集成电路设计与集成系统中的复杂工程问题进行识别和明确表达,通过文献研究及分析、模型构建及分析,最终形成有效的结论。 | 2.1能够对集成电路设计与集成系统领域中的复杂工程问题进行识别。 |
| | 2.2能够对集成电路设计与集成系统领域中的复杂工程问题进行准确的表述。 |
| | 2.3结合文献研究,将复杂集成电路工程问题进行有效分解和明确表述。 |
| | 2.4运用数学物理及专业基本原理,对集成电路工程问题进行建模分析,获得有效结论。明确设计需求,确定设计目标、实际限制条件,确定设计性能指标。 |
| 毕业要求3.解决方案:能够综合考虑经济、社会、健康、安全、法律、文化及环境因素,针对集成电路设计与集成系统复杂工程问题提出有效的解决方案,能够设计出满足一定需求条件的集成电路设计与集成系统模块,在设计过程中体现创新意识,对设计的系统进行功能测试、性能测试,并改进方案。 | 3.1综合考虑经济、社会、健康、安全、法律、文化及环境因素,针对集成电路设计与集成系统领域中的复杂工程问题,分析对比候选方案的可行性与性能,提出有效的解决方案。 |
| | 3.2依据解决方案,根据掌握的集成电路学科的基础知识,对集成电路相关模块,进行设计。 |
| | 3.3依据确定的解决方案,实现系统或模块,在设计实现环节上体现创造性。 |
| | 3.4对设计系统进行功能和性能测试,进行必要的方案改进。 |
| 毕业要求4.研究:能够针对集成电路设计与集成系统工程中的复杂问题,包括设计性实验及综合专题研究等环节中的相关数据,基于相关科学原理进行研究,通过收集信息、查阅文献、仿真分析、硬件调试实验等科学方法,分析数据并综合信息,最终给出有效的结论。 | 4.1针对集成电路设计与集成系统领域中的复杂工程问题,收集信息、查阅文献、分析现有技术的特点与局限性,并进行调研分析。 |
| | 4.2利用计算机软硬件技术及仿真工具,以及专业基础知识,设计实验或仿真方案。 |
| | 4.3通过查阅文献,实验,仿真等手段,进行工程问题的数据采集。 |
| | 4.4利用计算机软硬件技术及仿真工具,以及专业基础知识,分析数据并综合信息,评估并比较方案技术性能,最终给出有效的结论。 |
| 毕业要求5.工具使用:针对集成电路设计与集成系统复杂工程问题,能够选择与使用适合的现代工具和已有的技术资源,对问题进行预测和模拟,并在这些工具和技术资源过程中,理解其应用的局限性。 | 5.1针对集成电路设计与集成系统领域中的复杂工程问题,能够了解可供选择的现代工程工具,如:计算机、设计平台、开发平台、仿真平台等。 |
| | 5.2能够选择与使用恰当的技术、资源和现代工具,进行复杂工程问题的预测与模拟。 |
| | 5.3能够开发新型现代工程工具,进行建模与仿真,并能够理解其局限性。 |
| 毕业要求6.工程与社会:能够基于工程相关背景知识进行合理分析,评价专业工程实践和集成电路复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响,并理解应承担的责任。 | 6.1了解集成电路领域的科技发展动态及产业发展方向。了解国家对集成电路相关产业和电子信息产业政策及国内外有关知识产权的法律法规。具备社会、健康、安全、法律以及文化的基本素养。能够基于工程相关背景知识进行合理分析,能够了解专业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响。 |
| | 6.2能够分析评价专业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响,并理解应承担的责任。 |
| 毕业要求7.环境和可持续发展:能够理解和评价针对集成电路复杂工程问题的工程实践对环境、社会可持续发展的影响。 | 7.1能够理解集成电路领域复杂工程问题的工程实践对环境、社会可持续发展可能造成的影响。 |
| | 7.2能够评估工程方案对环境、社会可持续发展的影响,评估工程方案的可持续性,评价隐患。 |
| 毕业要求8.职业规范:具有人文社会科学素养、身体素质、心理素质、社会责任感,能够在工程实践中理解并遵守工程职业道德和规范,履行责任。 | 8.1了解并掌握国情,具有人文社会科学素养、身体素质、心理素质、社会责任感。 |
| | 8.2掌握,理解,并在工程实践中遵守工程职业道德规范。 |
| | 8.3理解工程实践中应担负的社会责任,愿意为社会服务,在工程实践中履行相应的责任。 |
| 毕业要求9.个人和团队:具有协作精神和团队意识,能够在多学科背景下的团队中担任负责人或普通成员,并承担相应的责任,共同完成团队任务。 | 9.1能够与集成电路学科及不同学科的团队人员合作,担任成员或领导者,承担个人责任,共同完成团队任务。 |
| | 9.2能够与集成电路学科及不同学科的团队人员合作,承担个人责任,独立完成工作相应的任务,协作完成团队任务。 |

| | | | | | | | | | | | |
|-------------|------------|--|------|-----|-----|----|---|-----|----|---|--------|
| | | Military Theory | | | | | | | | | |
| 体育学院 | 4210001170 | 体育1 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 1 | |
| | | Physical Education I | | | | | | | | | |
| 体育学院 | 4210002170 | 体育2 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | |
| | | Physical Education II | | | | | | | | | |
| 体育学院 | 4210003170 | 体育3 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 3 | |
| | | Physical Education III | | | | | | | | | |
| 体育学院 | 4210004170 | 体育4 | 1 | 32 | 32 | 0 | 0 | 0 | 0 | 4 | |
| | | Physical Education IV | | | | | | | | | |
| 外语学院 | 4030001210 | 大学英语1 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 1 | |
| | | College English I | | | | | | | | | |
| 外语学院 | 4030002210 | 大学英语2 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 2 | 大学英语1, |
| | | College English II | | | | | | | | | |
| 外语学院 | 4030003210 | 大学英语3 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 3 | 大学英语2, |
| | | College English III | | | | | | | | | |
| 外语学院 | 4030004210 | 大学英语4 | 2 | 48 | 32 | 0 | 0 | 0 | 16 | 4 | 大学英语3, |
| | | College English IV | | | | | | | | | |
| 计算机智能学院 | 4120001210 | C程序设计基础A | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 1 | |
| | | Foundations of C Language Programming A | | | | | | | | | |
| 计算机智能学院 | 4120005210 | 计算机基础与C程序设计综合实验A | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 1 | |
| | | Comprehensive Experiments of Foundation of Computer and C Language Programming A | | | | | | | | | |
| 小计 Subtotal | | | 31.0 | 744 | 512 | 32 | 0 | 136 | 64 | | |

(二)通识教育选修课程

2 General Education Elective Courses

| | | |
|---------------------------------|---|---|
| 核心选修 Core elective courses | 文明与传统 Civilization and Tradition Courses | 通识课程应修满至少9学分。核心选修不少于2学分；自主选修课程中，至少在艺术与审美、创新与创业两个领域各选修1门课程。 Minimum subtotal credits: 9. Core elective courses ≥2 credits. Self-selected courses, at least 1 course in art and aesthetics and 1 course in innovation and entrepreneurship. |
| | 社会与发展类 Society and Development Courses | |
| | 艺术与人文类 Art and Humanities Courses | |
| | 自然与方法类 Nature and methods Courses | |
| 自主选修选修 Core elective courses | 数学与自然科学,哲学与心理学,法学与社会科学,经济与管理,历史与文化,语言与文学,艺术与审美,创新与创业 Mathematics and Natural Sciences, Philosophy and Psychology, Science and Social Sciences, Economics and Management, History and Culture, Language and Literature, Art and Aesthetics, Innovation and Entrepreneurship | |

(三)大类必修课程

3 Basic Discipline Required Courses

| | | | | | | | | | | | |
|-------|------------|---|-----|----|----|----|---|---|---|---|---------|
| 理学院 | 4050229110 | 线性代数 | 2.5 | 40 | 40 | 0 | 0 | 0 | 0 | 1 | |
| | | Linear Algebra | | | | | | | | | |
| 理学院 | 4050001210 | 高等数学A上 | 4.5 | 72 | 72 | 0 | 0 | 0 | 0 | 1 | |
| | | Advanced Mathematics A I | | | | | | | | | |
| 信息学院 | 4110144110 | 专业导论 | 1 | 16 | 16 | 0 | 0 | 0 | 0 | 1 | |
| | | Introduction to Specialty | | | | | | | | | |
| 理学院 | 4050002210 | 高等数学A下 | 5.5 | 88 | 88 | 0 | 0 | 0 | 0 | 2 | |
| | | Advanced Mathematics A II | | | | | | | | | |
| 自动化学院 | 4100001210 | 电路原理B上 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 2 | 高等数学A上, |
| | | Circuit Principle B | | | | | | | | | |
| 自动化学院 | 4100002210 | 电路原理B实验上 | 0.5 | 16 | 0 | 16 | 0 | 0 | 0 | 2 | 电路原理B上, |
| | | Electric Circuits B Exp I | | | | | | | | | |
| 自动化学院 | 4100007210 | 电路原理B下 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 3 | 电路原理B上, |
| | | Circuit Principle B | | | | | | | | | |
| 自动化学院 | 4100006210 | 电路原理B实验下 | 0.5 | 16 | 0 | 16 | 0 | 0 | 0 | 3 | 电路原理B下, |
| | | Electric Circuits B Exp II | | | | | | | | | |
| 理学院 | 4050021110 | 大学物理A上 | 3.5 | 56 | 56 | 0 | 0 | 0 | 0 | 2 | |
| | | College Physics I | | | | | | | | | |
| 理学院 | 4050022110 | 大学物理A下 | 3.5 | 56 | 56 | 0 | 0 | 0 | 0 | 3 | |
| | | College Physics II | | | | | | | | | |
| 理学院 | 4050466130 | 物理实验A上 | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 3 | |
| | | Physics Experiment I | | | | | | | | | |
| 理学院 | 4050467130 | 物理实验A下 | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 4 | |
| | | Physics Experiment II | | | | | | | | | |
| 理学院 | 4050058110 | 概率论与数理统计B | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 3 | |
| | | Probability and Mathematical Statistics | | | | | | | | | |
| 理学院 | 4050052110 | 复变函数与积分变换B | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 3 | |
| | | Functions of a Complex Variable and Integral Transforms | | | | | | | | | |
| 信息学院 | 4110048110 | 模拟电子技术基础A | 4 | 64 | 64 | 0 | 0 | 0 | 0 | 3 | 电路原理B上, |
| | | Fundamentals of Analog Electronic Circuits | | | | | | | | | |
| 信息学院 | 4110051110 | 模拟电子技术基础实验 | 0.5 | 16 | 0 | 16 | 0 | 0 | 0 | 3 | |
| | | Experiments of Analog Electronics Circuit | | | | | | | | | |
| 信息学院 | 4110066110 | 数字电子技术基础C | 4 | 64 | 64 | 0 | 0 | 0 | 0 | 4 | |

| | | | | | | | | | | | |
|--------------------------------|------------|---|------|-----|-----|-----|---|---|---|---|------------------|
| | | Fundamentals of Digital Electronic Circuits | | | | | | | | | |
| 信息学院 | 4110068110 | 数字电子技术基础实验 | 0.5 | 16 | 0 | 16 | 0 | 0 | 0 | 4 | |
| | | Experiments of Digital Electronic Circuits | | | | | | | | | |
| 小计 Subtotal | | | 43.5 | 760 | 632 | 128 | 0 | 0 | 0 | | |
| (四)专业必修课程 | | | | | | | | | | | |
| 4 Specialized Required Courses | | | | | | | | | | | |
| 信息学院 | 4110034220 | 固态电子学 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 3 | |
| | | The Electron Theory of Solids | | | | | | | | | |
| 信息学院 | 4110093110 | 信号与系统A | 4.0 | 64 | 56 | 8 | 0 | 0 | 0 | 4 | |
| | | Signals and Systems | | | | | | | | | |
| 信息学院 | 4110035220 | 半导体器件物理 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 4 | |
| | | Physics of Semiconductor Devices | | | | | | | | | |
| 信息学院 | 4110036220 | 半导体物理与集成电路基础实验 | 0.5 | 16 | 0 | 16 | 0 | 0 | 0 | 4 | 固态电子学, |
| | | Experiments of Fundamentals of Semiconductor Physics and IC | | | | | | | | | |
| 信息学院 | 4110022210 | 单片机及嵌入式系统原理 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 5 | |
| | | Principle of MCU and Embedded System | | | | | | | | | |
| 信息学院 | 4110038220 | 计算机组成原理 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 5 | 数字电子技术基础C, |
| | | Principles of Computer Composition | | | | | | | | | |
| 信息学院 | 4110039220 | 数字集成电路基础 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 5 | 数字电子技术基础C, |
| | | Fundamentals of Digital Integrated Circuits | | | | | | | | | |
| 信息学院 | 4110030220 | 电磁场与电磁波E | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 3 | 复变函数与积分变换B, |
| | | Electromagnetic Fields and Wave E | | | | | | | | | |
| 信息学院 | 4110040220 | CMOS模拟集成电路设计实验上 | 1.5 | 48 | 48 | 0 | 0 | 0 | 0 | 6 | 固态电子学, |
| | | Experiments of CMOS Analog Integrated Circuit Design II | | | | | | | | | |
| 信息学院 | 4110041220 | CMOS模拟集成电路设计实验下 | 1.5 | 48 | 0 | 48 | 0 | 0 | 0 | 7 | CMOS模拟集成电路设计实验上, |
| | | Experiments of CMOS Analog Integrated Circuit Design II | | | | | | | | | |
| 信息学院 | 4110043220 | 数字集成电路系统可靠性设计实验 | 1 | 32 | 0 | 32 | 0 | 0 | 0 | 7 | |
| | | Reliability Design Experiments of Digital Integrated Circuit System | | | | | | | | | |
| 小计 Subtotal | | | 24.0 | 456 | 352 | 104 | 0 | 0 | 0 | | |
| (五)专业选修课程 | | | | | | | | | | | |
| 5 Specialized Elective Courses | | | | | | | | | | | |
| 信息学院 | 4110045220 | 数据结构 | 3 | 48 | 32 | 16 | 0 | 0 | 0 | 3 | C程序设计基础A, |
| | | Data Structures | | | | | | | | | |
| 信息学院 | 4110070220 | 集成电路数学基础 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 3 | |
| | | Mathematics Fundamentals of Integrated Circuit | | | | | | | | | |
| 信息学院 | 4110012220 | C++程序设计 | 2.5 | 40 | 32 | 8 | 0 | 0 | 0 | 3 | |
| | | The C++ Programming | | | | | | | | | |
| 信息学院 | 4110086170 | 物理光学C | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 5 | 大学物理A下, |
| | | Physical Optics | | | | | | | | | |
| 信息学院 | 4110325170 | 光电子技术C | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 5 | 大学物理A下, |
| | | Optoelectronic Technology | | | | | | | | | |
| 信息学院 | 4110031220 | 高频电子线路F | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 5 | 模拟电子技术基础A, |
| | | High-Frequency Electronic Circuits F | | | | | | | | | |
| 信息学院 | 4110324170 | 电子EDA与数字系统设计实验 | 1.5 | 48 | 0 | 48 | 0 | 0 | 0 | 5 | 数字电子技术基础C, |
| | | Electronic Design Automatic and Digital System Design | | | | | | | | | |
| 信息学院 | 4110046220 | 凸优化 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 6 | 数据结构, |
| | | Convex Optimization | | | | | | | | | |
| 信息学院 | 4110047220 | 集成光学理论与技术 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 6 | 大学物理A下,光电子技术C, |
| | | Integrated Optics : Theory and Technology | | | | | | | | | |
| 信息学院 | 4110334170 | 激光原理与技术D | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | 大学物理A下, |
| | | Principle and Technology of Laser | | | | | | | | | |
| 信息学院 | 4110048220 | 芯片光刻与激光微制造 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | 物理光学C, |

| | | | | | | | | | | | |
|-------------|------------|---|------|-----|-----|----|---|---|---|---|--------------|
| | | Microchip Photolithograph and Laser Micro Fabrication | | | | | | | | | |
| 信息学院 | 4110003210 | 集成电路与人工智能 | 2.5 | 40 | 32 | 8 | 0 | 0 | 0 | 6 | |
| | | Integrated Circuit and Artificial Intelligence | | | | | | | | | |
| 信息学院 | 4110335170 | 电子封装与表面组装技术A | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | 集成电路与人工智能, |
| | | Electronic Packaging and Surface Assembling | | | | | | | | | |
| 信息学院 | 4110050220 | IC物理设计基础 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 6 | |
| | | Fundamentals of IC Physical Design | | | | | | | | | |
| 信息学院 | 4110051220 | 高层次逻辑综合 | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 7 | |
| | | High-level Logic Synthesis | | | | | | | | | |
| 信息学院 | 4110333170 | 嵌入式微处理器系统B | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | Embedded Microprocessor System | | | | | | | | | |
| 信息学院 | 4110052220 | 集成电路时序与逻辑验证 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | |
| | | Integrated Circuit Sequence and Logic Verification | | | | | | | | | |
| 信息学院 | 4110053220 | 集成电路软硬件协同仿真 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | |
| | | Software and Hardware co-simulation of IC | | | | | | | | | |
| 信息学院 | 4110332170 | 微电子器件与集成电路设计B | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 6 | 固态电子学, |
| | | Microelectronic Devices and IC Design | | | | | | | | | |
| 信息学院 | 4110054220 | PCB设计与仿真 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | 单片机及嵌入式系统原理, |
| | | Design and Simulation of PCB | | | | | | | | | |
| 信息学院 | 4110336170 | 集成电路测试技术B | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 7 | |
| | | Measurement Techniques for IC | | | | | | | | | |
| 信息学院 | 4110055220 | 数字信号处理C | 3 | 48 | 48 | 0 | 0 | 0 | 0 | 7 | 信号与系统A, |
| | | Digital Signal Processing C | | | | | | | | | |
| 信息学院 | 4110339170 | 传感器原理与检测技术 | 1.5 | 24 | 24 | 0 | 0 | 0 | 0 | 7 | |
| | | Sensor Principle and Detection Technology | | | | | | | | | |
| 小计 Subtotal | | | 52.5 | 864 | 784 | 80 | 0 | 0 | 0 | | |

修读说明: 要求至少选修25学分, 其中集成电路数学基础为必修课程。

NOTE: Minimum subtotal credits:25. Mathematics Fundamentals of Integrated Circuit is a required course.

(六) 个性课程

6 Personalized Elective Courses

| | | | | | | | | | | | |
|-------------|------------|--|------|-----|-----|----|---|---|---|---|------------|
| 信息学院 | 4110340170 | 安卓应用程序设计 | 2.5 | 40 | 24 | 16 | 0 | 0 | 0 | 4 | |
| | | Android application programming | | | | | | | | | |
| 信息学院 | 4110056220 | 智慧感知网络技术与应用 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 5 | |
| | | Intelligent Perception Network Technology and Application | | | | | | | | | |
| 信息学院 | 4110057220 | 产品研发中试管控技术 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 5 | |
| | | Management and Control Technology in Pilot Scale Test of R&D | | | | | | | | | |
| 信息学院 | 4110058220 | 5G+智慧物联网技术 | 2 | 32 | 32 | 0 | 0 | 0 | 0 | 6 | |
| | | 5G+ Smart Internet of Things Technology | | | | | | | | | |
| 信息学院 | 4110275130 | 数据库应用 | 2.5 | 40 | 40 | 0 | 0 | 0 | 0 | 6 | |
| | | Database Application | | | | | | | | | |
| 信息学院 | 4110300140 | JAVA语言与面向对象程序设计B | 2 | 32 | 16 | 16 | 0 | 0 | 0 | 7 | C程序设计基础 A, |
| | | JAVA Language and Object Oriented Programming | | | | | | | | | |
| 小计 Subtotal | | | 13.0 | 208 | 176 | 32 | 0 | 0 | 0 | | |

修读说明: 学生从以上个性课程和学校发布的其它个性课程目录中选课, 要求至少选修6学分。

NOTE: Students can select courses from above and the other personalized courses in catalog, and are required to obtain at least 6 credits.

(七) 专业教育集中性实践教育环节

7 Specialized Practice Schedule

| | | | | | | | | | | | |
|-------|------------|--|---|----|---|---|---|----|---|---|--|
| 机电学院 | 4080152110 | 机械制造业工程实训D | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 4 | |
| | | Training on Mechanical Manufacturing Engineering D | | | | | | | | | |
| 自动化学院 | 4100068110 | 电工电子实习A | 2 | 32 | 0 | 0 | 0 | 32 | 0 | 3 | |
| | | Practice of Electrical Engineering & Electronics | | | | | | | | | |
| 信息学院 | 4110128110 | 模拟电子技术基础课程设计 | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 3 | |
| | | Course Design on Analog Electronic Circuits | | | | | | | | | |
| 信息学院 | 4110129110 | 数字电子技术基础课程设计 | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 4 | |
| | | Course Design on Digital Electronic Circuits | | | | | | | | | |
| 信息学院 | 4110105110 | MATLAB应用课程设计C | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 5 | |

| | | | | | | | | | | | |
|-------------|------------|--|------|-----|---|---|---|-----|---|---|--|
| | | Course Design on MATLAB Application | | | | | | | | | |
| 信息学院 | 4110064220 | 计算机组成原理课程设计 | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 5 | |
| | | Course Design on Principles of Computer Composition | | | | | | | | | |
| 信息学院 | 4110060220 | 数字集成电路基础课程设计 | 1 | 32 | 0 | 0 | 0 | 32 | 0 | 5 | |
| | | Course Design on Fundamentals of Digital Integrated Circuits | | | | | | | | | |
| 信息学院 | 4110078220 | 单片机及嵌入式系统原理课程设计 | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 6 | |
| | | Course Design on Principle of MCU and Embedded System | | | | | | | | | |
| 信息学院 | 4110065220 | 集成电路设计与集成系统专业方向课程设计 | 1 | 16 | 0 | 0 | 0 | 16 | 0 | 6 | |
| | | Course Design on speciality | | | | | | | | | |
| 信息学院 | 4110072220 | 专业实习 (集成电路) | 3 | 48 | 0 | 0 | 0 | 48 | 0 | 7 | |
| | | Practical Training in Major of Integrated Circuit | | | | | | | | | |
| 信息学院 | 4110073220 | 毕业设计 (集成电路) | 8.5 | 272 | 0 | 0 | 0 | 272 | 0 | 8 | |
| | | Graduation Thesis of Integrated Circuit | | | | | | | | | |
| 小计 Subtotal | | | 21.5 | 496 | 0 | 0 | 0 | 496 | 0 | | |

四、 修读指导

IV Recommendations on Course Studies

课外培养方案详见《武汉理工大学第二课堂课外学分实施办法》。《形势与政策》和《心理健康教育》课程为课外必修课程，分别计 2 个课外学分。

Please refer to the cultivation plan of the second class—Implementation Measures for Extracurricular Credits of the Second Class of Wuhan University of Technology. Situation & Policy (2 credits) and Mental Health Education (2 credits) are the required extracurricular courses.

学院教学负责人：李政颖

专业培养方案负责人：徐宁, 贺振华

导出word