

# 本科专业人才培养计划

## 电气信息学科分册

华中科技大学本科生院

二〇二二年九月



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## 电气与电子工程学院

电气与电子工程学院是华中科技大学（原华中工学院）1952 年建校时创办的四个院（系）之一，是国家首批博士点、博士后科研流动站和一级学科博士学位授权单位。学院所属的电气工程一级学科为国内首批一级学科国家重点学科，在教育部历轮学科评估中均名列全国前三。2017 年入选首批国家“双一流”建设学科。2019 年通过电气工程学科国际评估，评估结果显示学院的电气工程学科位于世界一流学科行列。

深入推进“人才强校”战略，加强师德师风建设，打造高水平师资队伍。截止 2021 年底，现有教师 209，其中教授 109，副教授 69，讲师 31，博导 104。高层次人才 62 人，其中：院士 3 人，长江学者特聘教授、国家杰出青年科学基金获得者等高层次人才 57 人，973 项目首席科学家和国家重点研发计划项目负责人 14 人；国家自然科学基金委创新研究群体 1 个，各类国家级教学科研团队 6 个。形成了一支学术研究方向明确、各方向研究力量均衡的卓越人才培养核心育人队伍，2018 年获国家级教学成果二等奖。

坚持面向世界科技前沿、经济主战场、国家重大需求、和人民生命健康，以一流科研引领支撑一流人才培养。学院牵头建设的国家脉冲强磁场科学中心为世界四大脉冲强磁场科学中心之一，学院于 2011 年获准建设的强电磁工程与新技术国家重点实验室，是国内高校电气工程学科 5 个国家重点实验室之一。另外学院还拥有国内三大、高校唯一的托卡马克磁约束聚变实验装置 J-TEXT，拥有国内高校唯一的新型电机国家专业实验室，建有包含电力安全、新型电机、脉冲功率、舰船电力等方面的 5 个省部级重点实验室和工程研究中心。十三五期间，学院牵头获得国家科技进步一等奖 1 项、二等奖 4 项，年均到院科研经费超 3 亿元。科研规模、研究能力和高端重大项目承担能力稳步增强，已构成学科覆盖广、类型布局优、创新动力强的科技创新平台体系。

坚持“立德树人”根本任务，完善“三全育人”机制，加强思想政治教育和课程思政建设，实施全球开放发展战略，深化与世界一流大学、顶尖研究机构的实质性合

作，不断推进重点行业、重点领域的战略合作，形成良好育人生态环境。每年累计争取到的本专业独有的社会奖学金超过 100 万元，每年为本院学生组织的电气专场招聘会超过 100 场，实现电气学子生活无忧、就业无忧。

七十年来，学院培养了各类毕业生 2 万多名，深受用人单位的好评，在最新一轮学科评估中，学科毕业生质量排名全国电气工程学科第一。我院 2020 届本科毕业生 60% 选择国内外知名高校继续研究深造，就业学生则大多赴电气相关领域的国防军工、国企央企、国内顶尖股份制企业等重要岗位建功立业。

学院本科招生与培养专业为电气工程及其自动化，目前在校本科生近 1800 名。2007 年获批教育部“第一类特色专业建设点”和国家级人才培养模式创新实验区；2010 年列入教育部首批卓越工程师教育培养计划，2019 年入选首批国家级一流本科专业建设点。

本专业将为学生打下坚实的自然科学、人文社会科学和电气工程专业基础，塑造正确的世界观、人生观、价值观，掌握科学的方法论，培养有志于服务国家战略需求的“宽口径、厚基础、强能力、重创新”的高素质创新人才。为此，学院结合学科发展方向，以一流学科所具有的学科优势、人才优势、平台优势为立足点，率先实施荣誉学士学位教育体系，推动课堂革命，全面打造人才培养高地，为学生提供追求卓越、超越自我的成长空间，2020 年授予第一批本科毕业生荣誉学士学位，2021 年在全校推广。同时制定本硕博贯通培养长线规划，实现学术研究、创新能力培养的有机衔接。

推进专创融合，打造新型“创意、创新、创业”人才发现和培养的教育平台，倡导学科交叉、探索未知、体验式学习与团队协作的教育理念，为学生提供专业创新方面的训练、指导和实践场所。我院本科生每年参与大学生创新创业项目近千人，近三年来，在国际级、国家级竞赛中获奖 60 人次，省级竞赛获奖 70 人次，2019、2020 年连续获全国“互联网+”创新创业大赛金奖、全国“挑战杯”一等奖等。

学院重视学生综合素质培养，通过组织丰富多彩的第二课堂活动，积极培养学生的管理能力、组织能力、协调能力、表达能力等各方面素质，促进学生身心健康。

在强化自身建设的同时，学院还先后与美、英、德、日、韩、俄、新加坡、香港等多所大学、研发机构和著名企业建立了广泛的多元化合作办学和合作研究关系，适应不同特色人才培养的要求。学院还与英国华威大学、伯明翰大学、美国亚利桑那州

立大学等多所国外著名高校开展“3+1”、“2+2”、“3+2”等形式的合作培养，中外双方均互认学分，成绩合格者除获得本校本科毕业文凭外还同时获得对方本科或硕士文凭。

专业核心课程包括：电路理论、电磁场与波、电子技术、微控制器原理及应用、信号与系统、自动控制理论、电机学、电力电子学、电气工程基础、高电压与绝缘技术、电力系统分析等。

毕业去向：国家电网、南方电网、电力设计研究院、电气装备制造等能源、电力企业及科研院所，以及交通、石化、环保、金融、医疗、信息等行业和政府机关等。

## 电气工程及其自动化专业本科培养计划

### Undergraduate Program in Electrical Engineering

#### 一、培养目标

##### I . Program Objectives

培养适应国家科技发展和经济社会发展需求，能在电力系统、电气装备、电磁科学等相关领域从事研究开发、设计制造、运行和管理等工作，具有国际视野和全球竞争力的德智体美劳全面发展的高素质创新人才。

预期毕业五年以上的毕业生：

- (1) 身心健康，具有正确人生观、高度社会责任感与良好的人文素养，适应独立和团队工作环境；
- (2) 能在社会大背景下系统解决电气工程及相关领域的复杂工程问题，创新意识突出；
- (3) 能通过终身学习促进职业发展，在组织管理、人际沟通和领导力方面勇于担当，敢于作为。

Meeting the needs of national social, economic and technological development, the students will be qualified for the R&D, manufacture, operation and management work in the related areas of power system, electrical power equipment manufacture and electromagnetic science research, have international vision and global competitiveness, and have comprehensive self-development in different areas including moral, intelligence, health, art and labor.

Students who graduated more than five years can be expected to

1. Be physically and mentally healthy, with a correct outlook on life, a high sense of social responsibility and good humanities, and be able to adapt to an independent and team work environment;
2. Be able to systematically solve complex engineering problems in electrical engineering and related fields under the social background, and have a prominent sense of innovation.
3. Be able to promote career development through lifelong learning, and have the courage to take responsibility and act in terms of organization management, interpersonal communication and leadership.

#### 二、毕业要求

##### II . Learning Outcomes

通过本专业的学习，毕业生应获得以下几个方面的知识、能力和素养：

Through the study of current program, graduates should acquire the following knowledge, capability and accomplishments:

1. 工程知识：系统掌握本专业领域必需的基础理论及专业知识，能将数学、自然科学、工程基础和专业知识用于解决电气工程领域复杂工程问题。

1. Engineering knowledge: Systematic mastery of the basic theories and professional knowledge necessary for this professional field, and the ability to use mathematics, natural sciences, engineering foundations and professional knowledge to solve complex engineering problems in the electrical engineering field.

2. 问题分析：能够应用数学、自然科学、工程科学的基本原理，识别、表达，并通过文献研



究分析电气工程领域复杂工程问题，以获得有效结论。

2. Problem analysis: Be able to apply the basic principles of mathematics, natural sciences, and engineering sciences, identify, express, and analyze complex engineering problems in the field of electrical engineering through literature research to obtain effective conclusions.

3. 设计/开发解决方案：能针对电气工程领域复杂工程问题提出合理的解决方案，设计满足特定需求的系统、单元（部件）、流程或算法，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Design/ development of solutions: Be able to propose reasonable solutions to complex engineering problems in the electrical engineering field, design systems, units (components), processes or algorithms that meet specific needs, and be able to reflect the sense of innovation in the design process, considering society, health, safety, law, culture and environmental factors.

4. 研究：能够基于科学原理并采用科学方法研究电气工程领域复杂工程问题，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

4. Investigation: Be able to study complex engineering problems in the field of electrical engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

5. 使用现代工具：能针对电气工程领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对电气工程领域复杂问题的预测与模拟，并能理解局限性。

5. Modern tool usage: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex engineering problems in the electrical engineering field, including the prediction and simulation of complex problems in the electrical engineering field, and understand their limitations.

6. 工程与社会：能基于电气工程相关背景知识进行合理分析，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。

6. Engineering and society: Be able to conduct reasonable analysis based on relevant background knowledge of electrical engineering, evaluate the impact of professional engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be undertaken.

7. 环境和可持续发展：能够分析和评价针对电气工程领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

7. Environment and sustainability: Be able to analyze and evaluate the impact of professional engineering practices aimed at complex engineering problems in the field of electrical engineering on the sustainable development of the environment and society.

8. 职业规范：具有良好的人文社会科学素养、较强的社会责任感，能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. Ethics: Possess good humanities and social science quality, a strong sense of social responsibility, can understand and abide by engineering professional ethics and norms in engineering practice, and perform responsibilities.

9. 个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individual and teamwork: Be able to assume the roles of individuals, team members and leaders in a team with a multidisciplinary background.

10. 沟通：能就电气工程领域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。具有一定的国际视野，能在跨文化背

景下进行沟通和交流。

10. Communication: Be able to effectively communicate with industry colleagues and the public on complex engineering issues in the electrical engineering field, including writing reports and designing manuscripts, making statements, expressing clearly or responding to instructions. Have a certain international perspective and be able to communicate in a cross-cultural context.

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。

11. Project management and finance: Understand and master engineering management principles and economic decision-making methods, and be able to apply them in a multi-disciplinary environment.

12. 终身学习：保持好奇心，不断进取，具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Life-long learning: Possess the consciousness of independent learning and lifelong learning, and have the ability to keep curiosity, keep learning, making progress and adapt to development.

### 三、培养特色

#### III. Program Highlights

通过拓展与创新学科研究方向，将传统电气工程学科方向拓展到超导电力、等离子体、加速器、强磁场、脉冲功率等强电磁工程领域，并将新的学科研究方向成果融入到人才培养中，建设了具有国际学科发展特色的电气工程创新人才培养体系。

By expanding and innovating the research direction of the discipline, the traditional electrical engineering discipline is extended to the fields of superconductivity, plasma, accelerator, strong magnetic field, pulse power and other strong electromagnetic engineering. The results of new disciplines are integrated into the training of talents, with the establishment of an electrical engineering innovative talent training system with international disciplinary development characteristics.

### 四、主干学科

#### IV. Main Disciplines

电气工程 Electrical Engineering,

相关学科：控制科学与工程 Control Science and Engineering, 计算机科学与技术 Computer Science and Technology, 电子科学与技术 Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：148.45 学分。其中，学科基础课程、专业核心课程不允许用其他课程学分冲抵和替代；通识教育基础课程中的选修课程，要求学生从管理、经济两类中至少各选一门 2 学分以上的课程，从文学与艺术类中至少选一门 2 学分的课程，从人工智能类中至少选一门 2 学分的课程，《大学生心理健康》必修。专业选修课程（8 学分）需从工具选修类课程中选修不少于 1.5 学分，从电力系统、电气装备、电磁科学 3 个专业方向选修类中选择一个方向，并在该方向中选修不少于 4 个学分。专业选修课程总学分不

低于 8 学分。

Minimum Credits of Curricular (comprising course system and intensified internship practical training): 148.45 credits. Major-related basic courses and core courses cannot be covered using credits from other courses in the program. Selected course in fundamental general education requires student to choose at least one course in both economy and management, with minimum credit of two for each; At least one course should be registered in the area of literature and art with two credits. Professional elective courses (8 credits) requires no less than 1.5 credits from the tool elective courses. Students should choose one of the three elective courses of electric power system, electrical equipment, and electromagnetic science, and elect no less than 4 credits in this direction. The total credits of professional elective courses shall not be less than 8 credits.

完成学业最低课外学分要求：5 学分。其中：要求每名学生至少必须参加一次各类竞赛或大创项目或专业教师的科研课题；须参加劳动教育 2 学分。

Minimum Extracurricular Credits: 5 credits. With the five credits, every student should attend at least one contest or university start-up program or real research topic with faculty members.

### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	636/33	22.68
		选修	160/10	5.7
学科基础课程		必修	1160/65.95	41.36
专业课程	专业核心课程	必修	288/18	10.27
	专业选修课程	选修	128/8	4.56
集中性实践教学环节		必修	432/13.5	15.4
其中：总实验（实践）学时及占比			814	29.03
总计			2804/148.45	100

Course type		Required/elective	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	636/33	22.68
		Elective	160/10	5.7
Discipline-related Courses		Required	1160/65.95	41.36
Courses in Specialty	Major-specific Core Courses	Required	288/18	10.27
	Major-specific Electives Courses	Elective	128/8	4.56
Internship and Practical Tranining		Required	432/13.5	15.4
Practicum Credits			814	29.03
Total			2804/148.45	100

### 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1.0	7.41
电气工程实践基础	必修	2/1.0	7.41
工程训练（八）	必修	1/0.5	3.70
生产实习	必修	2/1.0	7.41
工程综合训练	必修	2/1.0	7.41
科研综合训练	必修	2/1.0	7.41
毕业设计（论文）	必修	16/8.0	59.26
合计		27W /13.5	100

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Course Credits	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1.0	7.41
Fundamental of Electical Engineering Practice	Required	2/1.0	7.41
Engineering Training (VIII)	Required	1/0.5	3.70
Engineering Internship	Required	2/1.0	7.41
Engineering comprehensive training	Required	2/1.0	7.41
Researching comprehensive training	Required	2/1.0	7.41
Undergraduate Thesis	Required	16/8.0	59.26
Total		27W/13.5	100

3. 课外学分

Extracurricular Credits

序号	活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3	英语及计算机考试	全国大学英语六级考试	获六级证书者	2
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			32 学时获三等奖者	3
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
7	实验	视创新情况	每项	1~3
8	讲座	电气精英讲座	必须参加 4 次以上	2
9	讲座	综合素质培养系列讲座	必须参加 4 次以上	2
10	科研	大学生创新创业项目	通过	2
11	劳动教育 (必修)	32 学时		2

No.	Activities	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Individuals awarded "Active Participant"/Teams awarded "Excellent Performance" by HUST or HUBEI YOUTH League committee		2
2	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
3	Qualifications	CET-6	Certificate	2
		National Computer Rank Examination	Certificate(Grade 1/2)	2
		Qualifications for computer and software Technology proficiency	programmer	2
			Senior Programmer	3
			System Analyst	4

continue

No.	Activities	Requirements		Extracurricular Credits
4	Competitions	University Level	first prize	3
			second prize	2
			third prize	1
		Provincial Level	first prize	4
			second prize	3
			third prize	2
		National Level	first prize	6
			second prize	4
			third prize	3
5	Academic papers	Published in national-level journals	Each paper	2~3
6	Research Programs	Contribution and research capability	Each program	1~3
7	Experiments	Innovative capacity	Each experiment	1~3
8	Lecture	Lecture series given by elites in electrical engineering	A minimum of 4 times	2
9	Lecture	Discussion series on whole person education	A minimum of 4 times	2
10	Research Programs	Undergraduate Innovation and Entrepreneurship Projects	Pass	2
11	Labor Education	Public Service	Pass	2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、电磁场与波 Electromagnetic Fields & Waves、电子技术 Electronics、单片机原理及应用 Principles and Applications of Microcomputer、信号与系统 Signals and Systems、自动控制理论 Automatic Control Theory

专业核心课程 Core Courses in Specialty：电机学 Electrical Machinery Theory、电力电子学 Power Electronics、电气工程基础 Fundamental of Electrical Engineering、高电压与绝缘技术 High Voltage and Insulation Technology、电力系统分析 Power System Analysis

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course：电气工程实践基础 Fundamental of Electrical Engineering Practice 电路理论 Circuit Theory、电磁场与波 Electromagnetic Fields & Waves 电气工程学科概论 Introduction to Electrical Engineering、电气工程前沿导论 Introduction to Frontier of Electrical Engineering

创新能力培养课程 Innovative Ability Training Course：专业核心课程（Common Core Courses in Specialty

创新实践训练课程 Innovative Practice Training Course：工程综合训练：Engineering comprehensive training、科研综合训练 Researching comprehensive training

## 八、主要实践教学环节（含专业实验）

### VIII. Practical Module (experiments Included)

电气工程实验规范 Experimental specification for electrical engineering 电路测试技术基础 Fundamental of Circuit Measurement Technology、电子测试与实验 Electronic Testing and Experiments 微控制器原理及应用实验 Principles and Applications of Microcontroller Experiments, 信号与控制综合实验 Comprehensive Exp. on Signals and Control, 电气工程实践基础 Fundamental of Electrical Engineering Practice, 生产实习 Engineering Internship 工程综合训练 Engineering

comprehensive training 科研综合训练 Researching comprehensive training 工程训练 (八)  
Engineering Training (VIII)

## 九、教学进程计划表

### IX. Course schedule

院(系): 电气与电子工程学院

专业: 电气工程及其自动化

School (Department): School of Electrical and Electronic Engineering

Major: Electrical Engineering and Automation

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质 教育 通识 课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3.0			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3.0			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2.0			1
	必修 Required	SFL0001	综合英语 (一) Comprehensive of English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 (二) Comprehensive of English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2.0		4 (课外)	2
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 (二) Physical Education (II)	60	1.5			3-4
	必修 Required	PHE0022	大学体育 (三) Physical Education (III)	24	1.0			5-6
	必修 Required	NCC0001	计算机及程序设计基础(C++) Fundamental of Computer Programming (C++)	48	3.0		8	2
			从不同的课程模块中修读若干课程, 总学分不低于 10 学分 (管理、经济两类中至少各选一门 2 学分以上的课程。从美育类中至少选修一门 2 学分的课程、从人工智能类中至少选一门 2 学分的课程, 《大学生心理健康》必修) Choose courses from different course modules, with total credits no less than 10 credits (At least one course with no less than 2 credits from management and economics modules. At least one course should be registered in the area of literature and art.)	160	10			2-8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	MAT0551	微积分（一）（上） Calculus（I）	88	5.5			1
	必修 Required	MAT0531	微积分（一）（下） Calculus（II）	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4.0			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4.0			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments（I）	32	1.0	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments（II）	24	0.8	24		3
	必修 Required	CHE0511	大学化学 University Chemistry	32	2.0			1
	二选一 One out of two	EEE0401	生物学导论 Introduction to biology	32	2.0			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Require	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Mathematics Physics Equation and Special Function	40	2.5			4
	必修 Required	EEE0543	电路理论（上） Circuit Theory	48	3.0			2
	必修 Required	EEE0553	电路理论（下） Circuit Theory	48	3.0			3
	必修 Required	EEE0601	电路测试技术基础 Circuit Measurement Technology	32	1.0	32		3
	必修 Required	EIC0591	模拟电子技术（二） Analogue Electronics（II）	56	3.5			3
	必修 Required	EIC0761	数字电子技术 Digital Electronics	40	2.5			4
	必修 Required	EIC0121	电子测试与实验 Electronic Testing and Experiments	32	1.0	32		4
	必修 Required	EEE0581	信号与系统 Signals and Systems	40	2.5			4
	必修 Required	EEE0331	微控制器原理及应用 Principles and Applications of Microcontroller	40	2.5			5
	必修 Required	EEE0341	微控制器原理及应用实验 Principles and Applications of Microcontroller Experiments	24	0.8	24		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Discipline-related General Courses 学科基础课程	必修 Required	EEE0591	自动控制理论 Automatic Control Theory	56	3.5			5
	必修 Required	EEE0111	测量技术基础 Fundamentals of Detection and Measurement Technology	16	1.0			6
	必修 Required	EEE0621	信号与控制综合实验（一） Comprehensive Exp. on Signals and Control ( I )	24	0.8	24		5
	必修 Required	EEE0611	信号与控制综合实验(二) Comprehensive Exp. on Signals and Control ( II )	40	1.3	40		6
	必修 Required	EEE0201	电气工程实验规范 Experimental Specification for Electrical Engineering	8	0.25			2
	必修 Require	EEE2011	电磁场与波 Electromagnetic Field and Wave	64	4.0	4		4
Major-specific Core Courses 专业核心课程	必修 Required	EEE2022	电机学（上） Electrical Machinery Theory ( I )	48	3.0	6		4
	必修 Required	EEE2032	电机学（下） Electrical Machinery Theory ( II )	48	3.0	8		5
	必修 Required	EEE2041	电力电子学 Power Electronics	48	3.0			6
	必修 Required	EEE0181	电气工程基础 Fundamentals of Electrical Engineering	32	2.0			5
	必修 Required	EEE0241	高电压与绝缘技术 High Voltage and Insulation Technology	48	3.0			6
	必修 Required	EEE0171	电力系统分析（一） Power System Analysis ( I )	32	2.0			5
	必修 Required	EEE5061	电力系统分析（二） Power System Analysis ( II )	32	2.0			6
Specialty-oriented Courses 专业选修课程			通用选修类（ $\geq 2.0$ 学分）	32	2.0			
	选修 Elective	EEE0211	电气工程学科概论 Introduction to Electrical Engineering	24	1.5			6
	选修 Elective	EEE0191	电气工程前沿导论 Introduction to Frontier of Electrical Engineering	16	1.0			7
	选修 Elective	EEE5391	非线性电路基础 Fundamentals of Nonlinear Circuit	24	1.5			7
	选修 Elective	EEE5121	电磁兼容原理及应用 Principles and Applications on Electromagnetic Compatibility	24	1.5			7
	选修 Elective	EEE0271	计算机控制系统 Computer Control System	24	1.5			7
			工具选修类（ $\geq 1.5$ 学分）	24	1.5			
	选修 Elective	EEE5351	电气工程建模与仿真 Electrical Engineering Modeling and Simulations	32	2	16		6



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE0001	数据库技术及应用 Database Technology and Its Application	32	2.0		8	6
	选修 Elective	EEE5181	DSP 原理及应用 Principles and Applications of DSP	24	1.5			7
	选修 Elective	EEE0261	基于 Python 的数据分析与机器学习 Python-based Data Analysis and Machine Learning	24	1.5			7
	选修 Elective	EEE0221	电子线路综合设计 Comprehensive Design on Electronic Circuits	24	1.5			7
	选修 Elective	EEE0081	FPGA 应用开发 FPGA Application Design	24	1.5			7
	选修 Elective	EEE0091	PLC 原理与控制 Principle and control of PLC	24	1.5			7
			专业方向选修类：≥4 学分 某一专业方向类：不少于 4 个学分					
			电力系统类					
	选修 Elective	EEE5102	电力系统自动化 Automation of Power System	32	2.0			6
	选修 Elective	EEE5191	直流输电 DC Power Transmission	32	2.0			7
	选修 Elective	EEE5081	电力系统规划 Power System Planning	16	1.0			7
	选修 Elective	EEE5361	电力系统数字仿真 Power System Digital Simulation	24	1.5			7
	选修 Elective	EEE5371	电力市场 Electricity Markets	24	1.5			7
	选修 Elective	EEE5381	电力系统智能巡检机器人系统 Intelligent Robot Systems for Inspecting Power System	24	1.5			7
	选修 Elective	EEE5411	智能配电系统 Smart Distribution System	32	2.0			7
	选修 Elective	EEE0151	电力储能基础 Fundamentals of Electric Energy Storage	32	2.0			7
	选修 Elective	EEE0141	电力储能安全 Safety for Electric Energy Storage	16	1.0			7
	选修 Elective	EEE0161	电力储能应用 Applications of Electric Energy Storage	32	2.0			7
	选修 Elective	EEE5301	电力系统综合实验 Comprehensive Experiment on Power Systems	32	1.0	32		7
			电气装备类					
	选修 Elective	EEE5092	电力系统继电保护 Protective Relaying in Power Systems	32	2.0			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE5052	电力拖动与控制系统 Electric Drive and Control Systems	32	2.0	4		6
	选修 Elective	EEE5041	电力电子装置与系统 Power Electronic Devices and Systems	40	2.5			6
	选修 Elective	EEE5132	电磁装置设计原理 Principles of Electromagnetic Device Design	32	2.0			6
	选修 Elective	EEE5401	全数字化微机继电保护 Digital Protective Relays	16	1.0			7
	选修 Elective	EEE5011	半导体功率器件 Semiconductor Power Devices	24	1.5			7
	选修 Elective	EEE0351	无线电能传输系统 Wireless Power Transmission System	16	1.0			7
	选修 Elective	EEE0281	交通电气化概论 Introduction to Transportation Electrification	16	1.0			7
	选修 Elective	EEE0301	宽禁带功率器件应用基础 Introduction to the Application of Wide Band Gap Power Devices	24	1.5			7
	选修 Elective	EEE0361	新能源综合实验 Comprehensive Experiments on Renewable Energy	24	0.8			7
	选修 Elective	EEE5251	新型电机及应用 And Application of New Motor	24	1.5			7
	选修 Elective	EEE0121	磁场调制电机原理与应用 Principle and Application of Magnetic Field Modulation Motor	16	1.0			7
	选修 Elective	EEE0381	直线电机及系统 Linear Machines and Drive Systems	24	1.5			7
	选修 Elective	EEE0131	电动汽车驱动电机 Electric Vehicle Drive Motor	24	1.5			7
	选修 Elective	EEE0371	新型电力系统调频调相电机技术 Electric Machine Technology for Frequency and Phase Control of Incoming Power System	24	1.5			7
	选修 Elective	EEE5271	光纤传感技术 Optical Fiber Sensor Technique	24	1.5			7
	选修 Elective	EEE5141	电工材料 Electric Materials	24	1.5			7
	选修 Elective	EEE5311	高电压综合实验 Comprehensive Exp. on High Voltage	24	0.8	24		7
	选修 Elective	EEE0101	变电站电气设备 Substation Electrical Equipments	24	1.5			7
	选修 Elective	EEE0311	输变电设备外绝缘 External Insulation of Power Transmission and Transformation Equipment	24	1.5			7
	选修 Elective	EEE0291	聚合物电介质的研究与应用 Research and Application of Polymer Dielectrics	24	1.5			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE0391	智能电网电气检测技术及应用 Electrical Detection and Measurement Technology in Smart Grid	16	1.0			7
			电磁科学类					
	选修 Elective	EEE5021	超导电力技术 Superconducting Power Technology	32	2.0			7
	选修 Elective	EEE5292	脉冲功率技术 Pulse Power Technology	16	1.0			7
	选修 Elective	EEE0251	基于 MATLAB 的加速器理论与数字仿真 Matlab-based Accelerator Theory and Numerical Simulation	32	2.0			7
	选修 Elective	EEE5281	核能与核电原理 Principles of Nuclear Energy and Nuclear Power	32	2.0			7
	选修 Elective	EEE5261	工业等离子体应用 Industrial Plasma Applications	32	2.0			7
	选修 Elective	EEE5211	加速器原理及应用 Principle and Application Accelerator	24	1.5			7
	选修 Elective	EEE5031	磁场技术与应用 Magnetic Field Technology and Its Application	32	2.0			7
	选修 Elective	EEE0231	辐射技术应用 Radiation Technology and Applications	16	1.0			7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1.0			1
	必修 Required	ENG3571	工程训练（八） Engineering Training（VIII）	1w	0.5			2
	必修 Required	EEE3592	电气工程实践基础 Fundamentals of Electrical Engineering Practice	2w	1.0		+2w (课外选修)	2
	必修 Required	EEE3571	工程综合训练 Engineering Comprehensive Training	2w	1.0		+2w (课外选修)	4
	必修 Required	EEE3511	科研综合训练 Researching Comprehensive Training	2w	1.0		+2w (课外选修)	6
	必修 Required	EEE3581	生产实习 Engineering Internship	2w	1.0			6
	必修 Required	EEE3531	毕业设计 Undergraduate Thesis	16w	8.0			8

## 电气工程及其自动化专业本硕博实验班培养计划（本科阶段）

### Undergraduate-Master-Doctor Combined Program in Electrical Engineering and Automation

#### 一、培养目标

##### I . Program Objectives

##### (1) 本科阶段

培养适应国家科技发展和经济社会发展需求，能在电力系统、电气装备、电磁科学等相关领域从事研究开发、设计制造、运行和管理等工作，具有国际视野和全球竞争力的德智体美劳全面发展的高素质创新人才。

预期毕业五年以上的毕业生：

- 1) 身心健康，具有正确人生观、高度社会责任感与良好的人文素养，适应独立和团队工作环境；
- 2) 能在社会大背景下系统解决电气工程及相关领域的复杂工程问题，创新意识突出；
- 3) 能通过终身学习促进职业发展，在组织管理、人际沟通和领导力方面勇于担当，敢于作为。

##### (2) 研究生阶段

具有理想信念，创新能力强，综合素质高，具有电气工程学科坚实的理论基础和系统的专业知识，并在专门研究方向有系统、深入的专业知识和能力，能运用现代科学研究的方法和手段，独立从事科学研究，在科学或专门技术上取得创造性成果，能独立从事科学研究、教学、管理的德智体美劳全面发展的电气学科高级专门人才。

##### (1) Undergraduate level

Meeting the needs of national social, economical and technological development, the students will be qualified for the R&D, manufacture, operation and management work in the related areas of power system, electrical power equipment manufacture and electromagnetic science research, have international vision and global competitiveness, and have comprehensive self-development in different areas including moral, intelligence, health, art and labor.

Students who graduated more than five years can be expected to

1. Be physically and mentally healthy, with a correct outlook on life, a high sense of social responsibility and good humanities, and be able to adapt to an independent and team work environment;
2. Be able to systematically solve complex engineering problems in electrical engineering and related fields under the social background, and have a prominent sense of innovation.
3. Be able to promote career development through lifelong learning, and have the courage to take responsibility and act in terms of organization management, interpersonal communication and leadership.

##### (2) Graduate level

Possess strong innovation ability, solid theoretical foundation, and systematic professional knowledge of electrical engineering. Be able to use modern scientific research methods and tools to independently engage in scientific research, achieve creative achievements in science or technology development. Or be able to independently engage in teaching and management in electrical disciplines.

## 二、毕业要求

### II . Learning Outcomes

通过本专业的学习，毕业生应获得以下几个方面的知识、能力和素养：

Through the study of current program, graduates should acquire the following knowledge, capability and accomplishments:

1. 工程知识：系统掌握本专业领域必需的基础理论及专业知识，能将数学、自然科学、工程基础和专业知用于解决电气工程领域复杂工程问题。

1. Engineering knowledge: Systematic mastery of the basic theories and professional knowledge necessary for this professional field, and the ability to use mathematics, natural sciences, engineering foundations and professional knowledge to solve complex engineering problems in the electrical engineering field.

2. 问题分析：能够应用数学、自然科学、工程科学的基本原理，识别、表达，并通过文献研究分析电气工程领域复杂工程问题，以获得有效结论。

2. Problem analysis: Be able to apply the basic principles of mathematics, natural sciences, and engineering sciences, identify, express, and analyze complex engineering problems in the field of electrical engineering through literature research to obtain effective conclusions.

3. 设计/开发解决方案：能针对电气工程领域复杂工程问题提出合理的解决方案，设计满足特定需求的系统、单元（部件）、流程或算法，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Design/ development of solutions: Be able to propose reasonable solutions to complex engineering problems in the electrical engineering field, design systems, units (components), processes or algorithms that meet specific needs, and be able to reflect the sense of innovation in the design process, considering society, health, safety, law, culture and environmental factors.

4. 研究：能够基于科学原理并采用科学方法研究电气工程领域复杂工程问题，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

4. Investigation: Be able to study complex engineering problems in the field of electrical engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

5. 使用现代工具：能针对电气工程领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对电气工程领域复杂问题的预测与模拟，并能理解局限性。

5. Modern tool usage: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex engineering problems in the electrical engineering field, including the prediction and simulation of complex problems in the electrical engineering field, and understand their limitations.

6. 工程与社会：能基于电气工程相关背景知识进行合理分析，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。

6. Engineering and society: Be able to conduct reasonable analysis based on relevant background knowledge of electrical engineering, evaluate the impact of professional engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be undertaken.

7. 环境和可持续发展：能够分析和评价针对电气工程领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

7. Environment and sustainability: Be able to analyze and evaluate the impact of professional engineering practices aimed at complex engineering problems in the field of electrical engineering on the sustainable development of the environment and society.

8. 职业规范：具有良好的人文社会科学素养、较强的社会责任感，能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. Ethics: Possess good humanities and social science quality, a strong sense of social responsibility, can understand and abide by engineering professional ethics and norms in engineering practice, and perform responsibilities.

9. 个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individual and teamwork: Be able to assume the roles of individuals, team members and leaders in a team with a multidisciplinary background.

10. 沟通：能就电气工程领域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。具有一定的国际视野，能在跨文化背景下进行沟通和交流。

10. Communication: Be able to effectively communicate with industry colleagues and the public on complex engineering issues in the electrical engineering field, including writing reports and designing manuscripts, making statements, expressing clearly or responding to instructions. Have a certain international perspective and be able to communicate in a cross-cultural context.

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。

11. Project management and finance: Understand and master engineering management principles and economic decision-making methods, and be able to apply them in a multi-disciplinary environment.

12. 终身学习：保持好奇心，不断进取，具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Life-long learning: Possess the consciousness of independent learning and lifelong learning, and have the ability to keep curiosity, keep learning, making progress and adapt to development.

### 三、培养特色

#### III. Program Highlights

通过拓展与创新学科研究方向，将传统电气工程学科方向拓展到超导电力、等离子体、加速器、强磁场、脉冲功率等强电磁工程领域，并将新的学科研究方向成果融入到人才培养中，建设了具有国际学科发展特色的电气工程创新人才培养体系。

By expanding and innovating the research direction of the discipline, the traditional electrical engineering discipline is extended to the fields of superconductivity, plasma, accelerator, strong magnetic field, pulse power and other strong electromagnetic engineering. The results of new disciplines are integrated into the training of talents, with the establishment of an electrical engineering innovative talent training system with international disciplinary development characteristics.

### 四、主干学科

#### IV. Main Disciplines

电气工程 Electrical Engineering,

相关学科：控制科学与工程 Control Science and Engineering, 计算机科学与技术 Computer Science and Technology, 电子科学与技术 Electronic Science and Technology

## 五、学制与学位

### V. Program Length and Degree

本科阶段学制：四年

Undergraduate Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

研究生阶段学制：三到五年

Graduate Duration: 3-5 years

授予学位：工学博士

Degrees Conferred: Doctor of Engineering

## 六、学时与学分

### VI. Credits Hours and Units

本科阶段完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：149.05 学分。其中，学科基础课程、专业核心课程不允许用其他课程学分冲抵和替代；通识教育基础课程中的选修课程，要求学生从文学与艺术类中至少选一门 2 学分的课程，《大学生心理健康》必修。专业选修课程（8 学分）可从不同的课程模块中或研究生课程中修读，总学分不低于 8 学分。研究生课程认定为本科专业选修课程的学分数不超过 5 个学分。

Minimum Credits of Curricular (comprising course system and intensified internship practical training): 150.05 credits. Major-related basic courses and core courses cannot be covered using credits from other courses in the program. Selected course in fundamental general education requires student to choose at least one course in literature and art with two credits. Common elective courses in specialty (8 credits) can be chosen from different course modules, as well as graduate courses. The credits of graduate courses recognized as undergraduate elective courses should not exceed 5 credits.

本科阶段完成学业最低课外学分要求：5 学分。其中：要求每名学生至少必须参加一次各类竞赛或大创项目或专业教师的科研课题；须参加公益劳动 2 学分。

Minimum Extracurricular Credits: 5 credits. With the five credits, every student should attend at least one contest or university start-up program or real research topic with faculty members.

硕博连读、直攻博研究生总学分要求：53 学分。其中校级公共必修课程不少于 9 学分，校级公共选修课不少于 1 学分，学科基础与专业课不少于 24 学分，研究环节不少于 19 学分。

The total credit requirements for the postgraduate study of master-doctoral degree and direct study of doctoral degree: 53 credits. Among them, no less than 9 credits of school-level public compulsory courses, no less than 1 credit of school-level public elective courses, no less than 24 credits of subject basic and professional courses, and no less than 19 credits of research.

#### 1. 本科阶段课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	780/42	27.98
学科基础课程		必修	1128/66.55	40.46
专业课程	专业核心课程	必修	288/18	10.33
	专业选修课程	选修	128/8	4.59
集中性实践教学环节		必修	464/14.5	16.64
其中：总实验（实践）学时及占比			790	28.34
总计			2788/149.05	100

华中科技大学 2022 级本科专业培养计划

Course type		Required/elective	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	780/42	27.98
Discipline-related Courses		Required	1128/66.55	40.46
courses in specialty	Major-specific Core Courses	Required	288/18	10.33
	Major-specific Electives Courses	Required	128/8	4.59
Internship and Practical Training		Required	464/14.5	16.64
Practicum Credits			790	28.34
Total			2788/149.05	100

2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1.0	6.90
电气工程实践基础	必修	2/1.0	6.90
工程训练 (八)	必修	1/0.5	3.45
生产实习	必修	2/1.0	6.90
信号与控制综合项目设计	必修	2/1.0	6.90
工程综合训练	必修	2/1.0	6.90
科研综合训练	必修	2/1.0	6.90
毕业设计 (论文)	必修	16/8.0	55.17
合计		29W /14.5	100

Course Credits	Required / Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1.0	6.90
Fundamental of Electical Engineering Practice	Required	2/1.0	6.90
Engineering Training (VIII)	Required	1/0.5	3.45
Engineering Internship	Required	2/1.0	6.90
Control System Project Design	Required	2/1.0	6.90
Engineering comprehensive training	Required	2/1.0	6.90
Researching Comprehensive Training	Required	2/1.0	6.90
Undergraduate Thesis	Required	16/8.0	55.17
Total		29W /14.5	100

3. 课外学分

Extracurricular Credits

序号	活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3	英语及计算机考试	全国大学英语六级考试	获六级证书者	2
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1



续表

序号	活动名称	课外活动和社会实践的要求		课外学分
4	竞赛	省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
7	实验	视创新情况	每项	1~3
8	讲座	电气精英讲座	必须参加 4 次以上	2
9	讲座	综合素质培养系列讲座	必须参加 4 次以上	2
10	科研	大学生创新创业项目	通过	2
11	劳动教育（必修）	32 学时		2

No.	Activities	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant”/Teams awarded “Excellent Performance” by HUST or HUBEI YOUTH League committee		2
2	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
3	Qualifications	CET-6	Certificate	2
		National Computer Rank Examination	Certificate(Grade 1/2)	2
		Qualifications for computer and software Technology proficiency	programmer	2
			Senior Programmer	3
			System Analyst	4
4	Competitions	University Level	first prize	3
			second prize	2
			third prize	1
		Provincial Level	first prize	4
			second prize	3
			third prize	2
		National Level	first prize	6
			second prize	4
			third prize	3
5	Academic papers	Published in national-level journals	Each paper	2~3
6	Research Programs	Contribution and research capability	Each program	1~3
7	Experiments	Innovative capacity	Each experiment	1~3
8	Lecture	Lecture series given by elites in electrical engineering	A minimum of 4 times	2
9	Lecture	Discussion series on whole person education	A minimum of 4 times	2
10	Research Programs	Undergraduate Innovation and Entrepreneurship Projects	Pass	2
11	Labor Education	Public Service	Pass	2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、电磁场与波 Electromagnetic Fields & Waves、电子技术 Electronics、单片机原理及应用 Principles and Applications of Microcomputer、信号与系统 Signals and Systems、自动控制理论 Automatic Control Theory

专业核心课程 Core Courses in Specialty：电机学 Electrical Machinery Theory、电力电子学 Power Electronics、电气工程基础 Fundamental of Electrical Engineering、高电压与绝缘技术 High Voltage and Insulation Technology、电力系统分析 Power System Analysis

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course：电气工程实践基础 Fundamental of Electrical Engineering Practice 电路理论 Circuit Theory、电磁场与波 Electromagnetic Fields & Waves 电气工程学科概论 Introduction to Electrical Engineering、电气工程前沿导论 Introduction to Frontier of Electrical Engineering

创新能力培养课程 Innovative Ability Training Course：专业核心课程（Common Core Courses in Specialty

创新实践训练课程 Innovative Practice Training Course：工程综合训练：Engineering comprehensive training、科研综合训练 Researching comprehensive training

## 八、主要实践教学环节（含专业实验）

### VIII. Practical Module (experiments Included)

电气工程实验规范 Experimental specification for electrical engineering 电路测试技术基础 Fundamental of Circuit Measurement Technology、电子测试与实验 Electronic Testing and Experiments 微控制器原理及实践 Principles and Applications of Microcontroller, 信号与控制综合实验 Comprehensive Exp. on Signals and Control, 电气工程实践基础 Fundamental of Electrical Engineering Practice, 生产实习 Engineering Internship 工程综合训练 Engineering comprehensive training 科研综合训练 Researching comprehensive training 工程训练（八）Engineering Training (VIII)

## 九、教学进程计划表

### IX. Course schedule

院（系）：电气与电子工程学院

专业：电气工程及其自动化

School (Department): School of Electrical and Electronic Engineering

Major: Electrical Engineering and Automation

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3.0			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3.0			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2.0			1
	必修 Required	SFL0002	综合英语（一） Comprehensive of English ( I )	32	2.0			1
	必修 Required	SFL0012	综合英语（二） Comprehensive of English ( II )	32	2.0			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2.0		4 (课外)	2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education (II)	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education (III)	24	1.0			5-6
	必修 Required	NCC0001	计算机及程序设计基础(C++) Fundamental of Computer Programming (C++)	48	3.0		8	1
	必修 Required	EEE0011	人工智能导论 Introduction to Artificial Intelligence	32	2.0			1
	必修 Required	EEE0031	经济学导论 Introduction to Economics	32	2.0			3
	必修 Required	EEE0041	创新管理 Innovation Management	32	2.0			2
	必修 Required	EEE0061	中文写作 Chinese Writing	32	2.0			3
学科基础课程 Discipline-related General Courses	必修 Required	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	必修 Required	MAT0552	微积分（A）（上） Calculus ( I )	96	6.0			1
	必修 Required	MAT0532	微积分（A）（下） Calculus (II)	96	6.0			2
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4.0			2
	必修 Required	PHY0521	大学物理（二） Physics (II)	64	4.0			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1.0	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments (II)	24	0.8	24		3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related General Courses	必修 Required	CHE0511	大学化学 University Chemistry	32	2.0			1
	二选一 One out of two	EEE0401	生物学导论 Introduction to biology	32	2.0			1
	必修 Required	MAT0722	线性代数 (A) Linear Algebra	48	3.0			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Require	MAT0592	概率论与数理统计 (A) Probability and Mathematics Statistics	48	3.0			2
	必修 Required	MAT0701	数理方程与特殊函数 Mathematics Physics Equation and Special Function	40	2.5			4
	必修 Required	EEE0542	电路理论 (上) Circuit Theory	64	4.0			2
	必修 Required	EEE0554	电路理论 (下) Circuit Theory	32	2.0			3
	必修 Required	EEE0771	电子电路综合设计 (一) Comprehensive Design of Electronic Circuits ( I )	32	1.0	32		3
	必修 Required	EIC0591	模拟电子技术 (二) Analogue Electronics (II)	56	3.5			3
	必修 Required	EIC0761	数字电子技术 Digital Electronics	40	2.5			4
	必修 Required	EEE0801	电子电路综合设计 (二) Comprehensive Design of Electronic Circuits ( II )	32	1.0	32		4
	必修 Required	EEE0581	信号与系统 Signals and Systems	40	2.5			4
	必修 Required	EEE0321	微控制器原理及实践 Principles and Applications of Microcontroller	64	4.0	24		5
	必修 Required	EEE0591	自动控制理论 Automatic Control Theory	56	3.5			5
	必修 Required	EEE0111	测量技术基础 Fundamentals of Detection and Measurement Technology	16	1.0			6
	必修 Required	EEE0201	电气工程实验规范 Experimental Specification for Electrical Engineering	8	0.25			1
	必修 Required	EEE2011	电磁场与波 Electromagnetic Field and Wave	64	4.0	4		4
专业核心课程 Major-specific Core Courses	必修 Required	EEE2022	电机学 (上) Electrical Machinery Theory ( I )	48	3.0	6		4
	必修 Required	EEE2032	电机学 (下) Electrical Machinery Theory ( II )	48	3.0	8		5
	必修 Required	EEE2041	电力电子学 Power Electronics	48	3.0			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Major-specific Core Courses 专业核心课程	必修 Required	EEE0181	电气工程基础 Fundamentals of Electrical Engineering	32	2.0			5
	必修 Required	EEE0241	高电压与绝缘技术 High Voltage and Insulation Technology	48	3.0			6
	必修 Required	EEE0171	电力系统分析（一） Power System Analysis ( I )	32	2.0			5
	必修 Required	EEE5061	电力系统分析（二） Power System Analysis ( II )	32	2.0			6
Specialty-oriented Courses 专业选修课程			通用选修类 $\geq 2$ 学分	32	2.0			
	选修 Elective	EEE0211	电气工程学科概论 Introduction to Electrical Engineering	24	1.5			6
	选修 Elective	EEE0191	电气工程前沿导论 Introduction to Frontier of Electrical Engineering	16	1.0			7
	选修 Elective	EEE5391	非线性电路基础 Fundamentals of Nonlinear Circuit	24	1.5			7
	选修 Elective	EEE5121	电磁兼容原理及应用 Principles and Applications on Electromagnetic Compatibility	24	1.5			7
	选修 Elective	EEE0271	计算机控制系统 Computer Control System	24	1.5			7
			工具选修类 $\geq 1.5$ 学分	24	1.5			
	选修 Elective	EEE5351	电气工程建模与仿真 Electrical Engineering Modeling and Simulations	32	2.0	16		6
	选修 Elective	EEE0001	数据库技术及应用 Database Technology and Its Application	32	2.0		8	6
	选修 Elective	EEE5181	DSP 原理及应用 Principles and Applications of DSP	24	1.5			7
	选修 Elective	EEE0261	基于 Python 的数据分析与机器学习 Python-based Data Analysis and Machine Learning	24	1.5			7
	选修 Elective	EEE0221	电子线路综合设计 Comprehensive Design on Electronic Circuits	24	1.5			7
	选修 Elective	EEE0081	FPGA 应用开发 FPGA Application Design	24	1.5			7
	选修 Elective	EEE0091	PLC 原理与控制 Principle and Control of PLC	24	1.5			7
			专业方向选修类： $\geq 4$ 学分 某一专业方向类：不少于 4 个学分					
			电力系统类					
	选修 Elective	EEE5102	电力系统自动化 Automation of Power System	32	2.0			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE5191	直流输电 DC Power Transmission	32	2.0			7
	选修 Elective	EEE5081	电力系统规划 Power System Planning	16	1.0			7
	选修 Elective	EEE5361	电力系统数字仿真 Power System Digital Simulation	24	1.5			7
	选修 Elective	EEE5371	电力市场 Electricity Markets	24	1.5			7
	选修 Elective	EEE5381	电力系统智能巡检机器人系统 Intelligent Robot Systems for Inspecting Power System	24	1.5			7
	选修 Elective	EEE5411	智能配电系统 Smart Distribution System	32	2.0			7
	选修 Elective	EEE0151	电力储能基础 Fundamentals of Electric Energy Storage	32	2.0			7
	选修 Elective	EEE0141	电力储能安全 Safety for Electric Energy Storage	16	1.0			7
	选修 Elective	EEE0161	电力储能应用 Applications of Electric Energy Storage	32	2.0			7
	选修 Elective	EEE5301	电力系统综合实验 Comprehensive Experiment on Power Systems	32	1.0	32		7
			电气装备类					
	选修 Elective	EEE5092	电力系统继电保护 Protective Relaying in Power Systems	32	2.0			6
	选修 Elective	EEE5052	电力拖动与控制系统 Electric Drive and Control Systems	32	2.0	4		6
	选修 Elective	EEE5041	电力电子装置与系统 Power Electronic Devices and Systems	40	2.5			6
	选修 Elective	EEE5132	电磁装置设计原理 Principles of Electromagnetic Device Design	32	2.0			6
	选修 Elective	EEE5401	全数字化微机继电保护 Digital Protective Relays	16	1.0			7
	选修 Elective	EEE5011	半导体功率器件 Semiconductor Power Devices	24	1.5			7
	选修 Elective	EEE0351	无线电能传输系统 Wireless Power Transmission System	16	1.0			7
	选修 Elective	EEE0281	交通电气化概论 Introduction to Transportation Electrification	16	1.0			7
	选修 Elective	EEE0301	宽禁带功率器件应用基础 Introduction to the Application of Wide Band Gap Power Devices	24	1.5			7
	选修 Elective	EEE0361	新能源综合实验 Comprehensive Experiments on Renewable Energy	24	0.8			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE5251	新型电机及应用 And Application of New Motor	24	1.5			7
	选修 Elective	EEE0121	磁场调制电机原理与应用 Principle and Application of Magnetic Field Modulation Motor	16	1.0			7
	选修 Elective	EEE0381	直线电机及系统 Linear Machines and Drive Systems	24	1.5			7
	选修 Elective	EEE0131	电动汽车驱动电机 Electric Vehicle Drive Motor	24	1.5			7
	选修 Elective	EEE0371	新型电力系统调频调相电机技术 Electric Machine Technology for Frequency and Phase Control of Incoming Power System	24	1.5			7
	选修 Elective	EEE5271	光纤传感技术 Optical Fiber Sensor Technique	24	1.5			7
	选修 Elective	EEE5141	电工材料 Electric Materials	24	1.5			7
	选修 Elective	EEE5311	高电压综合实验 Comprehensive Exp. on High Voltage	24	0.8	24		7
	选修 Elective	EEE0101	变电站电气设备 Substation Electrical Equipments	24	1.5			7
	选修 Elective	EEE0311	输变电设备外绝缘 External Insulation of Power Transmission and Transformation Equipment	24	1.5			7
	选修 Elective	EEE0291	聚合物电介质的研究与应用 Research and Application of Polymer Dielectrics	24	1.5			7
	选修 Elective	EEE0391	智能电网电气检测技术及应用 Electrical Detection and Measurement Technology in Smart Grid	16	1.0			7
			电磁科学类					
	选修 Elective	EEE5021	超导电力技术 Superconducting Power Technology	32	2.0			7
	选修 Elective	EEE5292	脉冲功率技术 Pulse Power Technology	16	1.0			7
	选修 Elective	EEE0251	基于 MATLAB 的加速器理论与数字仿真 Matlab-based Accelerator Theory and Numerical Simulation	32	2.0			7
	选修 Elective	EEE5281	核能与核电原理 Principles of Nuclear Energy and Nuclear Power	32	2.0			7
	选修 Elective	EEE5261	工业等离子体应用 Industrial Plasma Applications	32	2.0			7
	选修 Elective	EEE5211	加速器原理及应用 Principle and Application Accelerator	24	1.5			7
	选修 Elective	EEE5031	磁场技术与应用 Magnetic Field Technology and Its Application	32	2.0			7
	选修 Elective	EEE0231	辐射技术应用 Radiation Technology and Applications	16	1.0			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1.0			1
	必修 Required	ENG3571	工程训练（八） Engineering Training（VIII）	1w	0.5			2
	必修 Required	EEE3592	电气工程实践基础 Fundamentals of Electrical Engineering Practice	2w	1.0		+2w (课外选修)	2
	必修 Required	EEE3571	工程综合训练 Engineering Comprehensive Training	2w	1.0		+2w (课外选修)	4
	必修 Required	EEE3661	信号与控制综合项目设计 Control System Project Design	2w	1.0			5
	必修 Required	EEE3511	科研综合训练 Researching Comprehensive Training	2w	1.0		+2w (课外选修)	6
	必修 Required	EEE3581	生产实习 Engineering Internship	2w	1.0			6
	必修 Required	EEE3531	毕业设计（研究生阶段开题准备） Undergraduate Thesis	16w	8.0			7-8

说明：选修课可直接选研究生阶段相关课程

附件：研究生阶段（硕士及博士阶段）

类别		课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	公共必修课程	408110001	自然辩证法概论	18	1	春秋	马克思主义学院	修满 9 学分
		408130001	新时代中国特色社会主义理论与实践研究	36	2	春秋	马克思主义学院	
		408210001	中国马克思主义与当代	36	2	秋	马克思主义学院	
		411130003	第一外国语（英语一）	32	2	春秋	外国语学院	
		411210001	英语论文写作	32	2	秋	外国语学院	
	公共选修课程							修满 1 学分
	一级学科基础课	011110001	矩阵论	48	3	秋	数学与统计学院	修满 8 学分
		011110002	数值分析	48	3	春	数学与统计学院	
		011210001	高等工程数学	64	4	春	数学与统计学院	
		131131001	高等工程电磁场	48	3	秋	电气与电子工程学院	
		131131002	气体放电理论	32	2	秋	电气与电子工程学院	
		131131003	高等电力电子学	32	2	秋	电气与电子工程学院	
		131131004	高功率脉冲技术	32	2	秋	电气与电子工程学院	
		131131005	现代电力系统分析	32	2	秋	电气与电子工程学院	
		131131006	核聚变原理	32	2	秋	电气与电子工程学院	
		131131041	现代控制理论	32	2	秋	电气与电子工程学院	
		131131042	电机数学模型与仿真分析	32	2	秋	电气与电子工程学院	
		131131061	英语科技论文写作思路及方法	16	1	春	电气与电子工程学院	



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续表

类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	二级学科基础课	131131007带电粒子束	32	2	秋	电气与电子工程学院	修满 4 学分
		131131009现代电力系统继电保护	32	2	秋	电气与电子工程学院	
		131131012超导电力科学技术	32	2	秋	电气与电子工程学院	
		131131013电弧电接触原理及应用	32	2	秋	电气与电子工程学院	
		131131014低温等离子体应用技术	48	3	秋	电气与电子工程学院	
		131131021现代交流电力传动系统	32	2	秋	电气与电子工程学院	
		131131023电力系统规划与可靠性	32	2	秋	电气与电子工程学院	
		131131024电机控制技术基础	32	2	秋	电气与电子工程学院	
		131131027新型风力发电系统及现代控制策略	32	2	秋	电气与电子工程学院	
		131131029机电动力系统分析与仿真	32	2	秋	电气与电子工程学院	
		131131030强磁场技术及其工程应用	32	2	秋	电气与电子工程学院	
		131131033加速器物理基础	32	2	秋	电气与电子工程学院	
		131131043现代电机设计	32	2	春	电气与电子工程学院	
		131131044电力系统广域测量系统及其应用	32	2	秋	电气与电子工程学院	
		131131045电力系统谐波	32	2	春	电气与电子工程学院	
		131131046数字控制系统理论与设计	32	2	秋	电气与电子工程学院	
		131131047电力电子智能化	32	2	秋	电气与电子工程学院	
		131131048微弱信号检测	32	2	秋	电气与电子工程学院	
		131131049高温等离子体诊断	32	2	秋	电气与电子工程学院	
		131131050等离子体物理基础	48	3	秋	电气与电子工程学院	
		131131060电介质基础理论及应用	32	2	春	电气与电子工程学院	
学位课程	硕士专业选修课程	131131008非线性动力学及其在电力系统中的应用	32	2	秋学期	电气与电子工程学院	修满 4 学分
		131131010射频与微波工程基础与应用	32	2	秋学期	电气与电子工程学院	
		131131011数字信号处理	32	2	秋学期	电气与电子工程学院	
		131131016电机数字控制系统设计	32	2	秋学期	电气与电子工程学院	
		131131017电力电子电路设计与应用	32	2	秋学期	电气与电子工程学院	
		131131018电力电子装置及系统的电磁兼容	32	2	秋学期	电气与电子工程学院	
		131131019过电压与绝缘配合	32	2	秋学期	电气与电子工程学院	
		131131020开关电器智能化	32	2	秋学期	电气与电子工程学院	
		131131022高电压测试技术	32	2	秋学期	电气与电子工程学院	
		131131025工程电动力学	32	2	秋学期	电气与电子工程学院	
		131131026磁流体力学	48	3	秋学期	电气与电子工程学院	
		131131028高电压新技术及应用	32	2	春学期	电气与电子工程学院	
		131131031电力市场	32	2	秋学期	电气与电子工程学院	
		131131032电源管理技术与集成电路设计	32	2	春学期	电气与电子工程学院	
		131131034加速器应用与材料辐射改性	32	2	秋学期	电气与电子工程学院	
		131131035新型电机及控制技术	32	2	秋学期	电气与电子工程学院	
		131131037电磁干扰与防护	32	2	秋学期	电气与电子工程学院	
		131131038电机驱动理论及应用	32	2	春学期	电气与电子工程学院	
		131131039能源电化学	32	2	秋学期	电气与电子工程学院	
		131131040磁约束等离子体数值计算	32	2	春学期	电气与电子工程学院	
		131131051工程电磁场数值分析与应用	32	2	春学期	电气与电子工程学院	

续表

类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	硕士专业选修课程	131131052 电力自动化系统	32	2	秋学期	电气与电子工程学院	
		131131053 高压电气设备绝缘及状态感知	32	2	秋学期	电气与电子工程学院	
		131131054 光伏发电与储能系统	32	2	秋学期	电气与电子工程学院	
		131131055 电力电子技术在电力系统中的应用	32	2	秋学期	电气与电子工程学院	
		131131056 电力电子与运动控制系统建模与控制	32	2	春学期	电气与电子工程学院	
		131131057 应用超导材料	32	2	秋学期	电气与电子工程学院	
		电力能源互联网技术	16	1	秋学期	电气与电子工程学院	
		分布式能源并网技术	32	2	秋学期	电气与电子工程学院	
		131131058 科研方法导论	32	2	春学期	电气与电子工程学院	
	博士专修课程	131231001 雷电放电及防护	32	2	春学期	电气与电子工程学院	
		131231002 电磁波与等离子体相互作用	32	2	春学期	电气与电子工程学院	
		131231003 新型永磁电机及其控制	32	2	春学期	电气与电子工程学院	
		131231004 大电网及主设备继电保护关键技术	32	2	春学期	电气与电子工程学院	
		131231005 可再生能源电力变换传输及存储系统	32	2	春学期	电气与电子工程学院	
		131231006 等离子体生物医学	32	2	春学期	电气与电子工程学院	
		131231008 交流电机绕组理论及应用	32	2	春学期	电气与电子工程学院	
		131231009 电力电子技术在分布式发电中的应用	32	2	春学期	电气与电子工程学院	
		131231010 磁约束聚变前沿专题	32	2	春学期	电气与电子工程学院	
		131231011 复杂机电动力系统建模与分析	32	2	春学期	电气与电子工程学院	
		131231012 电力电子化电力系统动态过程	32	2	春学期	电气与电子工程学院	
		131231013 基于广域量测的大电网安全防御系统	16	1	春学期	电气与电子工程学院	
	跨一级学科课程						修满 4 学分
非学位课	补修课程	如有需要, 可在导师指导下补修本科阶段课程、任选课程只计成绩, 不计学分					
研究环节	650219001	博士学位论文(学术型)		15		研究生院	修满 19 学分
	650239001	开题报告(博)		1			
	650239002	论文中期进展报告(博)		1			
	650239003	参加国内外学术会议并提交论文(博)		1			
	650239004	发表学术论文(博)		1			
其他	650000000	中国语文水平达标测试	0	0			前置学历非本校的学生必修

有关个性化培养的几点建议:

1、各院(系)根据专业人才培养的多元化需求和学生个性化培养的需要, 一般设置不少于 25 学分的专业选修课程供本院(系)相关专业学生和其他院(系)学生修读。

2、各院(系)在专业选修课程设置时, 应注意各课程间的前后修读关系, 并在培养计划和课程教学大纲中明确修读相应条件。

## 电气工程及其自动化专业卓越计划实验班本科培养计划

### Undergraduate Experimental Program in Electrical Engineering and Automation for Exemplary Engineer Education

#### 一、培养目标

##### I . Program Objectives

培养适应国家科技发展和经济社会发展需求，能在电力系统、电气装备、电磁科学等相关领域从事研究开发、设计制造、运行和管理等工作，具有国际视野和全球竞争力的德智体美劳全面发展的高素质创新人才。

预期毕业五年以上的毕业生：

- (1) 身心健康，具有正确人生观、高度社会责任感与良好的人文素养，适应独立和团队工作环境；
- (2) 能在社会大背景下系统解决电气工程及相关领域的复杂工程问题，创新意识突出；
- (3) 能通过终身学习促进职业发展，在组织管理、人际沟通和领导力方面勇于担当，敢于作为。

Meeting the needs of national social, economic and technological development, the students will be qualified for the R&D, manufacture, operation and management work in the related areas of power system, electrical power equipment manufacture and electromagnetic science research, have international vision and global competitiveness, and have comprehensive self-development in different areas including moral, intelligence, health, art and labor.

Students who graduated more than five years can be expected to

1. Be physically and mentally healthy, with a correct outlook on life, a high sense of social responsibility and good humanities, and be able to adapt to an independent and team work environment;
2. Be able to systematically solve complex engineering problems in electrical engineering and related fields under the social background, and have a prominent sense of innovation.
3. Be able to promote career development through lifelong learning, and have the courage to take responsibility and act in terms of organization management, interpersonal communication and leadership.

#### 二、毕业要求

##### II . Learning Outcomes

通过本专业的学习，毕业生应获得以下几个方面的知识、能力和素养：

Through the study of current program, graduates should acquire the following knowledge, capability and accomplishments:

1. 工程知识：系统掌握本专业领域必需的基础理论及专业知识，能将数学、自然科学、工程基础和专业知识用于解决电气工程领域复杂工程问题。

1. Engineering knowledge: Systematic mastery of the basic theories and professional knowledge necessary for this professional field, and the ability to use mathematics, natural sciences, engineering foundations and professional knowledge to solve complex engineering problems in the electrical

engineering field.

2. 问题分析：能够应用数学、自然科学、工程科学的基本原理，识别、表达，并通过文献研究分析电气工程领域复杂工程问题，以获得有效结论。

2. Problem analysis: Be able to apply the basic principles of mathematics, natural sciences, and engineering sciences, identify, express, and analyze complex engineering problems in the field of electrical engineering through literature research to obtain effective conclusions.

3. 设计/开发解决方案：能针对电气工程领域复杂工程问题提出合理的解决方案，设计满足特定需求的系统、单元（部件）、流程或算法，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Design/ development of solutions: Be able to propose reasonable solutions to complex engineering problems in the electrical engineering field, design systems, units (components), processes or algorithms that meet specific needs, and be able to reflect the sense of innovation in the design process, considering society, health, safety, law, culture and environmental factors.

4. 研究：能够基于科学原理并采用科学方法研究电气工程领域复杂工程问题，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

4. Investigation: Be able to study complex engineering problems in the field of electrical engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

5. 使用现代工具：能针对电气工程领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对电气工程领域复杂问题的预测与模拟，并能理解局限性。

5. Modern tool usage: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex engineering problems in the electrical engineering field, including the prediction and simulation of complex problems in the electrical engineering field, and understand their limitations.

6. 工程与社会：能基于电气工程相关背景知识进行合理分析，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。

6. Engineering and society: Be able to conduct reasonable analysis based on relevant background knowledge of electrical engineering, evaluate the impact of professional engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be undertaken.

7. 环境和可持续发展：能够分析和评价针对电气工程领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

7. Environment and sustainability: Be able to analyze and evaluate the impact of professional engineering practices aimed at complex engineering problems in the field of electrical engineering on the sustainable development of the environment and society.

8. 职业规范：具有良好的人文社会科学素养、较强的社会责任感，能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. Ethics: Possess good humanities and social science quality, a strong sense of social responsibility, can understand and abide by engineering professional ethics and norms in engineering practice, and perform responsibilities.

9. 个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individual and teamwork: Be able to assume the roles of individuals, team members and leaders in a team with a multidisciplinary background.

10. 沟通：能就电气工程领域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。具有一定的国际视野，能在跨文化背景下进行沟通和交流。

10. Communication: Be able to effectively communicate with industry colleagues and the public on complex engineering issues in the electrical engineering field, including writing reports and designing manuscripts, making statements, expressing clearly or responding to instructions. Have a certain international perspective and be able to communicate in a cross-cultural context.

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。

11. Project management and finance: Understand and master engineering management principles and economic decision-making methods, and be able to apply them in a multi-disciplinary environment.

12. 终身学习：保持好奇心，不断进取，具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Life-long learning: Possess the consciousness of independent learning and lifelong learning, and have the ability to keep curiosity, keep learning, making progress and adapt to development.

### 三、培养特色

#### III. Program Highlights

通过拓展与创新学科研究方向，将传统电气工程学科方向拓展到超导电力、等离子体、加速器、强磁场、脉冲功率等强电磁工程领域，并将新的学科研究方向成果融入到人才培养中，建设了具有国际学科发展特色的电气工程创新人才培养体系。

By expanding and innovating the research direction of the discipline, the traditional electrical engineering discipline is extended to the fields of superconductivity, plasma, accelerator, strong magnetic field, pulse power and other strong electromagnetic engineering. The results of new disciplines are integrated into the training of talents, with the establishment of an electrical engineering innovative talent training system with international disciplinary development characteristics.

### 四、主干学科

#### IV. Main Disciplines

电气工程 Electrical Engineering,

相关学科：控制科学与工程 Control Science and Engineering, 计算机科学与技术 Computer Science and Technology, 电子科学与技术 Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：147.45 学分。其中，学科基础课程、专业核心课程不允许用其他课程学分冲抵和替代；通识教育基础课程中的选修课程，要求学生从管理、经济两类中至少各选一门 2 学分以上的课程，从文学与艺术类中至少选一门 2 学分的课程，从人工智能类中至少选一门 2 学分的课程，《大学生心理健康》必修。专业选修课

程（8 学分）需从工具选修类课程中选修不少于 1.5 学分，从电力系统、电气装备、电磁科学 3 个专业方向选修类中选择一个方向，并在该方向中选修不少于 4 个学分。专业选修课程总学分不低于 8 学分。

Minimum Credits of Curricular (comprising course system and intensified internship practical training): 147.45 credits. Major-related basic courses and core courses cannot be covered using credits from other courses in the program. Selected course in fundamental general education requires student to choose at least one course in both economy and management, with minimum credit of two for each; At least one course should be registered in the area of literature and art with two credits. Professional elective courses (8 credits) requires no less than 1.5 credits from the tool elective courses. Students should choose one of the three elective courses of electric power system, electrical equipment, and electromagnetic science, and elect no less than 4 credits in this direction. The total credits of professional elective courses shall not be less than 8 credits.

完成学业最低课外学分要求：5 学分。其中：要求每名学生至少必须参加一次各类竞赛或大创项目或专业教师的科研课题；须参加劳动教育 2 学分。

Minimum Extracurricular Credits: 5 credits. With the five credits, every student should attend at least one contest or university start-up program or real research topic with faculty members.

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	588/30	20.85
		选修	160/10	5.67
学科基础课程		必修	1160/65.95	41.13
专业课程	专业核心课程	必修	288/18	10.21
	专业选修课程	选修	128/8	4.54
集中性实践教学环节		必修	496/15.5	17.59
其中：总实验（实践）学时及占比			878	31.13
总计			2820/147.45	100

Course type		Required/elective	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	588/30	20.85
		Elective	160/10	5.67
Discipline-related Courses		Required	1160/65.95	41.13
courses in specialty	Major-specific Core Courses	Required	288/18	10.21
	Major-specific Electives Courses	Elective	128/8	4.54
Internship and Practical Training		Required	496/15.5	17.59
Practicum Credits			878	31.13
Total			2820/147.45	100

#### 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	6.45
工程训练(八)	必修	1/0.5	3.23
电气工程实践基础	必修	2/1.0	6.45
工程综合训练	必修	2/1	6.45
科研综合训练	必修	2/1	6.45
生产实习	必修	2/1	6.45
综合训练	必修	4/2	12.90
毕业设计（论文）	必修	16/8	51.61
合计		31W /15.5	100

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Course Credits	Required/elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6.45
Engineering Training (VIII)	Required	1/0.5	3.23
Fundamental of Electical Engineering Practice	Required	2/1.0	6.45
Engineering comprehensive training	Required	2/1	6.45
Researching Comprehensive Training	Required	2/1	6.45
Engineering Internship	Required	2/1	6.45
Comprehensive Training	Required	4/2	12.90
Undergraduate Thesis	Required	16/8	51.61
Total		31w /15.5	100

3. 课外学分

Extracurricular Credits

序号	活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告，通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践（必修）	提交调查报告，取得成绩		2
3	英语及计算机考试	全国大学英语六级考试	获六级证书者	2
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
7	实验	视创新情况	每项	1~3
8	讲座	电气精英讲座	必须参加 4 次以上	2
9	讲座	综合素质培养系列讲座	必须参加 4 次以上	2
10	科研	大学生创新创业项目	通过	2
11	劳动教育（必修）	32 学时		2

No.	Activities	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” /Teams awarded “Excellent Performance” by HUST or HUBEI YOUTH League committee		2
2	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
3	Qualifications	CET-6	Certificate	2
		National Computer Rank Examination	Certificate (Grade 1/2)	2

continue

No.	Activities	Requirements		Extracurricular Credits
3	Qualifications	Qualifications for computer and software Technology proficiency	programmer	2
			Senior Programmer	3
			System Analyst	4
4	Competitions	University Level	first prize	3
			second prize	2
			third prize	1
		Provincial Level	first prize	4
			second prize	3
			third prize	2
		National Level	first prize	6
			second prize	4
			third prize	3
5	Academic papers	Published in national-level journals	Each paper	2~3
6	Research Programs	Contribution and research capability	Each program	1~3
7	Experiments	Innovative capacity	Each experiment	1~3
8	Lecture	Lecture series given by elites in electrical engineering	A minimum of 4 times	2
9	Lecture	Discussion series on whole person education	A minimum of 4 times	2
10	Research Programs	Undergraduate Innovation and Entrepreneurship Projects	Pass	2
11	Labor Education	Public Service	Pass	2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、电磁场与波 Electromagnetic Fields & Waves、电子技术 Electronics、单片机原理及应用 Principles and Applications of Microcomputer、信号与系统 Signals and Systems、自动控制理论 Automatic Control Theory

专业核心课程 Core Courses in Specialty：电机学 Electrical Machinery Theory、电力电子学 Power Electronics、电气工程基础 Fundamental of Electrical Engineering、高电压与绝缘技术 High Voltage and Insulation Technology、电力系统分析 Power System Analysis

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course：电气工程实践基础 Fundamental of Electrical Engineering Practice 电路理论 Circuit Theory、电磁场与波 Electromagnetic Fields & Waves 电气工程学科概论 Introduction to Electrical Engineering、电气工程前沿导论 Introduction to Frontier of Electrical Engineering

创新能力培养课程 Innovative Ability Training Course：专业核心课程（Common Core Courses in Specialty

创新实践训练课程 Innovative Practice Training Course：工程综合训练：Engineering comprehensive training、科研综合训练 Researching comprehensive training

## 八、主要实践教学环节（含专业实验）

### VIII. Practical Module (experiments Included)

电气工程实验规范 Experimental specification for Electrical Engineering 电路测试技术基础 Fundamental of Circuit Measurement Technology、电子测试与实验 Electronic Testing and Experiments 微控制器原理及应用实验 Principles and Applications of Microcontroller Experiments, 信号与控制综合实验 Comprehensive Exp. on Signals and Control, 电气工程实践基础 Fundamental



of Electrical Engineering Practice, 生产实习 Engineering Internship 工程综合训练 Engineering comprehensive training 科研综合训练 Researching comprehensive training 工程训练 (八) Engineering Training (VIII)

## 九、教学进程计划表

### IX. Course schedule

院 (系): 电气与电子工程学院

专业: 电气工程及其自动化

School (Department): School of Electrical and Electronic Engineering

Major: Electrical Engineering and Automation

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3.0			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3.0			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2.0			1
	必修 Required	SFL0002	综合英语 (一) Comprehensive of English ( I )	32	2.0			1
	必修 Required	SFL0012	综合英语 (二) Comprehensive of English ( II )	32	2.0			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2.0		4 (课外)	2
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 (二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育 (三) Physical Education ( III )	24	1.0			5-6
	必修 Required	NCC0001	计算机及程序设计基础(C++) Fundamental of Computer Programming(C++)	48	3.0		8	2
			从不同的课程模块中修读若干课程, 总学分不低于 10 学分 (管理、经济两类中至少各选一门 2 学分以上的课程。从美育类中至少选修一门 2 学分的课程、从人工智能类中至少选一门 2 学分的课程, 《大学生心理健康》必修) Choose courses from different course modules, with total credits no less than 10 credits (At least one course with no less than 2 credits from management and economics modules. At least one course should be registered in the area of literature and art.)	160	10			2-8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	MESE0891	工程制图 (一) Engineering Graphics ( I )	40	2.5			1
	必修 Required	MAT0551	高等数学 (A) (上) Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	高等数学 (A) (下) Calculus (II)	88	5.5			2
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4.0			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4.0			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1.0	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.8	24		3
	必修 Required	CHE0511	大学化学 University Chemistry	32	2.0			1
	二选一 One out of two	EEE0401	生物学导论 Introduction to Biology	32	2.0			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Require	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Mathematics Physics Equation and Special Function	40	2.5			4
	必修 Required	EEE0543	电路理论 (上) Circuit Theory	48	3.0			2
	必修 Required	EEE0553	电路理论 (下) Circuit Theory	48	3.0			3
	必修 Required	EEE0601	电路测试技术基础 Circuit Measurement Technology	32	1.0	32		3
	必修 Required	EIC0591	模拟电子技术 (二) Analogue Electronics (II)	56	3.5			3
	必修 Required	EIC0761	数字电子技术 Digital Electronics	40	2.5			4
	必修 Required	EIC0121	电子测试与实验 Electronic Testing and Experiments	32	1.0	32		4
	必修 Required	EEE0581	信号与系统 Signals and Systems	40	2.5			4
	必修 Required	EEE0331	微控制器原理及应用 Principles and Applications of Microcontroller	40	2.5			5
	必修 Required	EEE0341	微控制器原理及应用实验 Principles and Applications of Microcontroller Experiments	24	0.8	24		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	EEE0591	自动控制理论 Automatic Control Theory	56	3.5			5
	必修 Required	EEE0111	测量技术基础 Fundamentals of Detection and Measurement Technology	16	1.0			6
	必修 Required	EEE0621	信号与控制综合实验（一） Comprehensive Exp. on Signals and Control ( I )	24	0.8	24		5
	必修 Required	EEE0611	信号与控制综合实验(二) Comprehensive Exp. on Signals and Control ( II )	40	1.3	40		6
	必修 Required	EEE0201	电气工程实验规范 Experimental Specification for Electrical Engineering	8	0.25			1
	必修 Require	EEE2011	电磁场与波 Electromagnetic Field and Wave	64	4.0	4		4
专业核心课程 Major-specific Core Courses	必修 Required	EEE2022	电机学（上） Electrical Machinery Theory ( I )	48	3.0	6		4
	必修 Required	EEE2032	电机学（下） Electrical Machinery Theory ( II )	48	3.0	8		5
	必修 Required	EEE2041	电力电子学 Power Electronics	48	3.0			6
	必修 Required	EEE0181	电气工程基础 Fundamentals of Electrical Engineering	32	2.0			5
	必修 Required	EEE0241	高电压与绝缘技术 High Voltage and Insulation Technology	48	3.0			6
	必修 Required	EEE0171	电力系统分析（一） Power System Analysis ( I )	32	2.0			5
	必修 Required	EEE5061	电力系统分析（二） Power System Analysis ( II )	32	2.0			6
专业选修课程 Specialty-oriented Courses			通用选修类	32	2.0			
	选修 Elective	EEE0211	电气工程学科概论 Introduction to Electrical Engineering	24	1.5			6
	选修 Elective	EEE0191	电气工程前沿导论 Introduction to Frontier of Electrical Engineering	16	1.0			7
	选修 Elective	EEE5391	非线性电路基础 Fundamentals of Nonlinear Circuit	24	1.5			7
	选修 Elective	EEE5121	电磁兼容原理及应用 Principles and Applications on Electromagnetic Compatibility	24	1.5			7
	选修 Elective	EEE0271	计算机控制系统 Computer Control System	24	1.5			7
			工具选修类（≥1.5 学分）	24	1.5			
	选修 Elective	EEE5351	电气工程建模与仿真 Electrical Engineering Modeling and Simulations	32	2.0	16		6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE0001	数据库技术及应用 Database Technology and Its Application	32	2.0		8	6
	选修 Elective	EEE5181	DSP 原理及应用 Principles and Applications of DSP	24	1.5			7
	选修 Elective	EEE0261	基于 Python 的数据分析与机器学习 Python-based Data Analysis and Machine Learning	24	1.5			7
	选修 Elective	EEE0221	电子线路综合设计 Comprehensive Design on Electronic Circuits	24	1.5			7
	选修 Elective	EEE0081	FPGA 应用开发 FPGA Application Design	24	1.5			7
	选修 Elective	EEE0091	PLC 原理与控制 Principle and Control of PLC	24	1.5			7
			专业方向选修类：≥4 学分 某一专业方向类：不少于 4 个学分					
			电力系统类					
	选修 Elective	EEE5102	电力系统自动化 Automation of Power System	32	2.0			6
	选修 Elective	EEE5191	直流输电 DC Power Transmission	32	2.0			7
	选修 Elective	EEE5081	电力系统规划 Power System Planning	16	1.0			7
	选修 Elective	EEE5361	电力系统数字仿真 Power System Digital Simulation	24	1.5			7
	选修 Elective	EEE5371	电力市场 Electricity Markets	24	1.5			7
	选修 Elective	EEE5381	电力系统智能巡检机器人系统 Intelligent Robot Systems for Inspecting Power System	24	1.5			7
	选修 Elective	EEE5411	智能配电系统 Smart Distribution System	32	2.0			7
	选修 Elective	EEE0151	电力储能基础 Fundamentals of Electric Energy Storage	32	2.0			7
	选修 Elective	EEE0141	电力储能安全 Safety for Electric Energy Storage	16	1.0			7
	选修 Elective	EEE0161	电力储能应用 Applications of Electric Energy Storage	32	2.0			7
	选修 Elective	EEE5301	电力系统综合实验 Comprehensive Experiment on Power Systems	32	1.0	32		7
			电气装备类					
	选修 Elective	EEE5092	电力系统继电保护 Protective Relaying in Power Systems	32	2.0			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE5052	电力拖动与控制系统 Electric Drive and Control Systems	32	2.0	4		6
	选修 Elective	EEE5041	电力电子装置与系统 Power Electronic Devices and Systems	40	2.5			6
	选修 Elective	EEE5132	电磁装置设计原理 Principles of Electromagnetic Device Design	32	2.0			6
	选修 Elective	EEE5401	全数字化微机继电保护 Digital Protective Relays	16	1.0			7
	选修 Elective	EEE5011	半导体功率器件 Semiconductor Power Devices	24	1.5			7
	选修 Elective	EEE0351	无线电能传输系统 Wireless Power Transmission System	16	1.0			7
	选修 Elective	EEE0281	交通电气化概论 Introduction to Transportation Electrification	16	1.0			7
	选修 Elective	EEE0301	宽禁带功率器件应用基础 Introduction to the Application of Wide Band Gap Power Devices	24	1.5			7
	选修 Elective	EEE0361	新能源综合实验 Comprehensive Experiments on Renewable Energy	24	0.8			7
	选修 Elective	EEE5221	建筑电子工程 Building Electronic Engineering	24	1.5			7
	选修 Elective	EEE5251	新型电机及应用 And Application of New Motor	24	1.5			7
	选修 Elective	EEE0121	磁场调制电机原理与应用 Principle and Application of Magnetic Field Modulation Motor	16	1.0			7
	选修 Elective	EEE0381	直线电机及系统 Linear Machines and Drive Systems	24	1.5			7
	选修 Elective	EEE0131	电动汽车驱动电机 Electric Vehicle Drive Motor	24	1.5			7
	选修 Elective	EEE0371	新型电力系统调频调相电机技术 Electric Machine Technology for Frequency and Phase Control of Incoming Power System	24	1.5			7
	选修 Elective	EEE5271	光纤传感技术 Optical Fiber Sensor Technique	24	1.5			7
	选修 Elective	EEE5141	电工材料 Electric Materials	24	1.5			7
	选修 Elective	EEE5311	高电压综合实验 Comprehensive Exp. on High Voltage	24	0.8	24		7
	选修 Elective	EEE0101	变电站电气设备 Substation Electrical Equipments	24	1.5			7
	选修 Elective	EEE0311	输变电设备外绝缘 External Insulation of Power Transmission and Transformation Equipment	24	1.5			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EEE0291	聚合物电介质的研究与应用 Research and Application of Polymer Dielectrics	24	1.5			7
	选修 Elective	EEE0391	智能电网电气检测技术及应用 Electrical Detection and Measurement Technology in Smart Grid	16	1.0			7
			电磁科学类					
	选修 Elective	EEE5021	超导电力技术 Superconducting Power Technology	32	2.0			7
	选修 Elective	EEE5292	脉冲功率技术 Pulse Power Technology	16	1.0			7
	选修 Elective	EEE0251	基于 MATLAB 的加速器理论与数字仿真 Matlab-based Accelerator Theory and Numerical Simulation	32	2.0			7
	选修 Elective	EEE5281	核能与核电原理 Principles of Nuclear Energy and Nuclear Power	32	2.0			7
	选修 Elective	EEE5261	工业等离子体应用 Industrial Plasma Applications	32	2.0			7
	选修 Elective	EEE5211	加速器原理及应用 Principle and Application Accelerator	24	1.5			7
	选修 Elective	EEE5031	磁场技术与应用 Magnetic Field Technology and Its Application	32	2.0			7
	选修 Elective	EEE0231	辐射技术应用 Radiation Technology and Applications	16	1.0			7
	选修 Elective	EEE0231	辐射技术应用 Radiation Technology and Applications	16	1.0			7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1.0			1
	必修 Required	ENG3571	工程训练（八） Engineering Training（VIII）	1w	0.5			2
	必修 Required	EEE3592	电气工程实践基础 Fundamentals of Electrical Engineering Practice	2w	1.0		+2w (课外选修)	2
	必修 Required	EEE3571	工程综合训练 Engineering Comprehensive Training	2w	1.0		+2w (课外选修)	4
	必修 Required	EEE3511	科研综合训练 Researching Comprehensive Training	2w	1.0		+2w (课外选修)	6
	必修 Required	EEE3581	生产实习 Engineering Internship	2w	1.0			6
	必修 Required	EEE3521	综合训练 Comprehensive Training	4w	2.0			4-7
	必修 Required	EEE3531	毕业设计 Undergraduate Thesis	16w	8.0			8

## 计算机科学与技术学院

计算机科学与技术学院下设 5 个研究所：人工智能与优化研究所、数据工程研究所、并行分布式计算研究所、数据存储研究所、数字媒体研究所；“外存储系统国家专业实验室”、“教育部信息存储系统重点实验室”、“中国教育科研网格主结点”、“国家高性能计算中心（武汉）”、“服务计算技术与系统教育部重点实验室”、“湖北省数据库工程技术研究中心”、“教育部数据存储系统与技术工程研究中心”等设在该院。

学院拥有计算机系统结构国家重点学科和计算机科学与技术一级学科博士学位授予权，拥有计算机系统结构、计算机软件与理论、计算机应用技术、信息安全 4 个博士学位和硕士学位授予权，计算机科学与技术一级学科博士后流动站。

学院有计算机科学与技术、数据科学与大数据技术、物联网工程 3 个本科专业，其中“计算机科学与技术”是国家特色专业，物联网工程为湖北省战略性新兴产业相关专业。

## 计算机科学与技术专业本科培养计划

### Undergraduate Program for Specialty in Computer Science & Technology

#### 一、培养目标

##### I . Program Objectives

本专业培养具有社会主义核心价值观、强烈社会责任感和使命感、适应社会经济和我国信息产业自主可控战略发展需求，扎实的数学、自然科学、工程基础和计算机科学与技术专业知识与能力，创新精神与实践能力强，系统能力突出，具有良好人文素养、大工程观、团队精神、国际视野和可持续竞争力。毕业后能从事计算机领域相关的研究、设计、开发与管理工作，能解决计算机领域复杂工程问题。工作五年左右，可成为单位、领域或行业的技术骨干或业界精英。

In this major, whilst upholding the core socialist values and shouldering the strong sense of social responsibility in line with the demand of economy, society and China's information industry, the students will become the research talents in computer science with an excellent command of mathematics, natural science, engineering foundation, computer science and technology expertise and skills and great qualities of innovation, practical ability, and computer system design ability who are also refined in humanistic literacy, the idea of large-scale engineering, team spirit, global vision and sustainable competitive edge. It is expected that the graduates of the program are competent in the works related to research, design, development and management and capable to solve the complex engineering project challenges in the field of computer science, which will enable them to become the backbone of their organizations and the best of the brightest in the industry after about five-year's work experience.

#### 二、基本规格要求

##### II . Learning Outcomes

1. 工程知识：具备数学、自然科学、工程基础和计算机专业知识，并能用于解决计算机复杂工程问题；

2. 问题分析：能够应用数学、自然科学、工程科学以及计算机科学的基本原理，识别、表达、并通过文献研究分析计算机复杂工程问题，以获得有效结论；

3. 设计/开发解决方案：能设计针对计算机复杂工程问题的解决方案，设计满足特定需求的系统、模块或算法流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；

4. 研究：能基于计算机科学原理并采用科学方法对计算机复杂工程问题进行研究，通过实验设计、建模仿真、数据分析与解释、模型验证与改进方式，对计算机复杂工程问题进行研究并得到合理有效结论；

5. 使用现代工具：能够针对计算机复杂工程问题设计、预测、模拟与实现的需要，开发、选择与使用恰当的技术、软硬件及系统资源、现代化开发工具，并能够理解所使用工具和资源的局限性；

6. 工程与社会：能够基于工程领域相关背景知识进行合理分析，评价计算机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，能理解并承担工程师的社会



责任;

7. 环境和可持续发展：能理解和评价针对计算机领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响;

8. 职业规范：具有良好的人文社会科学素养和社会责任感，能够在计算机工程实践中理解并遵守工程职业道德和规范，履行工程师的责任;

9. 个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中协同工作，并承担个体、团队成员以及负责人的角色;

10. 沟通：能够就计算机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，熟悉计算机工程项目管理的基本方法和技术，并能在多学科环境中应用;

12. 终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应信息技术新发展的能力。

Students are expected to gain :

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

以数理为基础，以信息学科为背景，以计算机科学与技术为培养方向，以学术能力培养为中心，以创新能力培养为重点，理论与应用相兼顾，软件与系统相结合，计算机科学与计算机工程并重。加强学术氛围，培养学术兴趣，挖掘学术潜力。采用基于问题/项目的教学方法，培养在计算机软件与理论、系统结构、人工智能的研究、设计、开发和工程组织等方面具有综合能力的学术型人才。

Based on the basis of mathematics and background of information science, directed towards computer science and technology, centered in academic ability training, this program emphasizes on innovation spirit, bears theory and application in mind, combines software and hardware education, and balances on computer science and computer engineering. Based on the method of problem-based or project-based learning, this program aims to cultivate academic talents with comprehensive abilities on research, design, development and engineering in the area of computer theory and software, architecture and artificial intelligence.

### 四、主干学科

#### IV. Main Disciplines

计算机科学与技术 Computer Science & Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Program Length : 4 years

授予学位：工学学士

Degrees Conferred : Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：154

Minimum Credits of Curricular(Comprising course system and intensified internship practical training) : 154

完成学业最低课外学分要求：8

Minimum Extracurricular Credits : 8

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别	课程性质	学时/学分	学时/学分占比 (%)
素质教育通识课程	必修	588/30	19.7/19.5
	选修	160/10	5.4/6.5
学科大类基础课程	必修	776/44.25	26/28.7
专业核心课	必修	640/34.25	21.5/22.2
专业选修课	选修	320/20	10.7/13

续表

课程类别	课程性质	学时/学分	学时/学分占比 (%)
集中性实践教学环节	必修	31w/15.5	16.7/10.1
实践教学合计	必修	320+31w/25.5	27.4/16.6
合计		2980/154	100/100

Course Classified	Course Nature	Hrs/Crs	Hrs/Crs Percentage (%)
Essential-qualities-oriented Education	Required	588/30	19.7/19.5
General Courses	Elective	160/10	5.4/6.5
Basic Courses in General Discipline	Required	776/44.25	26/28.7
Common Core Courses	Required	640/34.25	21.5/22.2
Specialty-Oriented Courses	Elective	320/20	10.7/13
Internship and Practical Training	Required	31w/15.5	16.7/10.1
Practical Teaching Total	Required	320+31w/25.5	27.4/16.6
Total		2980/154	100/100

## 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	6.5
工程训练	必修	2/1	6.5
生产实习 (社会实践)	必修	3/1.5	9.7
课程设计及综合实践	必修	10/5	32.3
毕业设计 (论文)	必修	14/7	45
合计		31/15.5	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6.5
Electrical Engineering Practice	Required	2/1	6.5
Engineering Internship (Social Practice)	Required	3/1.5	9.7
Course Project	Required	10/5	32.3
Undergraduate Thesis	Required	14/7	45
Total		31/15.5	100

## 3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	社会实践	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩	2
3	劳动教育 (必修)	32 学时	2
4	计算机考试 (必修)	CCF 计算机软件能力认证 CSP 成绩 200~500 分	2~5
5	英语考试	CET6	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
6	学科竞赛	校级	获 1/2/3 等奖者
		省级	获 1/2/3 等奖者
		全国	获 1/2/3 等奖者
7	讲座	Time 系列讲座	参加 4 次以上
8	论文	在国际及全国性会议或期刊发表论文	每篇论文
9	科研	参与科研项目 (含大创项目)	每项

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同; 完成洛谷规定编程任务可认定 CSP 成绩 200 分。

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No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and political course Social Practice (Required)	Submit a report and obtain a passing score		2
3	Labor Education (Required)	Public Service (32 hours)		2
4	Computer Examinations (Required)	Certified Software Professional 200-500		2~5
5	English Examinations	CET-6	PASS	2
		TOFEL	90 Points or Higher	4
		IELTS	6.5 Points or Higher	4
		GRE	1350 Points or Higher	4
6	Competitions	University Level	Win 1st/2nd/3rd prize	2/1/1
		Provincial Level	Win 1st/2nd/3rd prize	4/3/3
		National Level	Win 1st/2nd/3rd prize	6/5/5
7	Lectures	TIME Lecture series	A minimum of 4 times	2
8	Academic papers	International conference or national publications	Per piece	2~4
9	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	2~4

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 专业主干课 Main Courses in Specialty

C 语言程序设计 Advanced Programming Language (C)、离散数学 Discrete Mathematics、数据结构 Data Structure、数字电路与逻辑设计 Digital Circuit and Logic Design、计算机系统基础 Introduction to Computer System、操作系统原理 Operating System、数据库系统原理 Database System、计算机组成原理 Computer Organization、软件工程 Software Engineering 计算机通信与网络 Computer Telecommunications & Network、编译原理 Compiler Principles、计算机系统结构 Computer Architecture 等。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

1. 创新（创业）意识启迪课程 Innovation (Entrepreneurship) Awareness Enlightenment Courses

信息技术导论 (IT 中国) (必修) Introduction to Information Technology、素质教育通识课程中选修至少 1 学分的创业类课程、人工智能导论 (选修) Artificial Intelligence、大数据导论 (选修) Big Data Introduction

2. 创新（创业）能力培养课程 Innovation (Entrepreneurship) Ability Training Courses  
操作系统原理 Operating System、数据库系统原理 Database System、计算机组成原理 Computer Organization

3. 创新（创业）实践培养课程 Innovation Practice Training Courses

系统能力培养综合实践 Comprehensive Training of System Ability

# 八、主要实践教学环节（含专业实验）

## VIII. Practicum Module (experiments included)

工程训练 Engineering Training、程序设计综合课程设计 Course Project of Programming、操作系统课程设计 Course Project of Operating System、硬件综合训练 Project of Hardware System、生产实习 Engineering Internship、系统能力培养综合实践 Comprehensive Training of System Ability、毕业设计 Undergraduate Thesis.

# 九、教学进程计划表

## IX. Course schedule

院（系）：计算机科学与技术学院

专业：计算机科学与技术

School (Department) : School of Computer Science & Technology

Major: Computer Science & Technology

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			4-6
	必修 Required	CH0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
			从不同公选模块中选修不低于 10 学分的课程（其中美育类不低于 2 学分，经济与管理类不少于 2 学分，思维与方法类不少于 1 学分，《大学生心理健康》必修） General Education Courses (elective)	160	10			2-8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础课程 Basic Courses in General Discipline	必修 Required	CST0721	信息技术导论 (IT 中国) Introduction to Information Technology	24	1.5			1
	必修 Required	CST0511	C 语言程序设计 Advanced Programming Language (C)	48	3			1
	必修 Required	CST0521	C 语言程序设计实验 Advanced Programming Language Experiments	32	1		32	1
	必修 Required	MAT0551	微积分 (一) 上 Calculus (I)	88	5.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0551	物理实验 (一) Physical Experiments (I)	32	1	32		2
	必修 Required	MAT0531	微积分 (一) 下 Calculus (I)	88	5.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	EEE0641	电路理论 (三) Circuit Theory (III)	64	4			3
	必修 Required	CST0641	数字电路与逻辑设计 (一) Digital Circuit and Logic Design (I)	48	3			3
	必修 Required	CST0652	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5		16	3
	必修 Required	CST0661	信号与线性系统 Signal and Linear System	32	2			4
	必修 Required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			5
	必修 Required	CST0551	计算机通信与网络实践 Computer Telecommunications & Network Experiments	32	1		32	5
专业核心课程 Specialty Required Courses	必修 Required	CST2171	离散数学 (一) Discrete Mathematics (I)	40	2.5			2
	必修 Required	CST2261	数据结构 Data Structure	48	3			2
	必修 Required	CST2272	数据结构实验 Data Structure Experiments	32	1		32	2
	必修 Required	CST2161	离散数学 (二) Discrete Mathematics (II)	40	2.5			3
	必修 Required	CST2261	算法设计与分析 Algorithmic Design & Analysis	32	2			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	CST2421	算法设计与分析实践 Algorithmic Design & Analysis	24	0.75		24	3
	必修 Required	CST5161	计算机系统基础 Introduction of Computer System	40	2.5			4
	必修 Required	CST0041	计算机系统基础实验 Introduction of Computer System Experiments	32	1		32	4
	必修 Required	CST2141	计算机组成原理 Computer Organization	48	3			4
	必修 Required	CST2151	计算机组成原理实验 Computer Organization Experiments	16	0.5		16	4
	必修 Required	CST2281	数据库系统原理 Database System	48	3			4
	必修 Required	CST2291	数据库系统原理实践 Database System Experiments	32	1		32	4
	必修 Required	CST2032	操作系统原理 Operating System	48	3			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5		16	5
	必修 Required	CST2231	软件工程 Software Engineering	32	2			5
	必修 Required	CST2011	编译原理 Compiler Principles	48	3			6
	必修 Required	CST2021	编译原理实验 Compiler Principles Experiments	32	1		32	6
	必修 Required	CST2131	计算机系统结构 Computer Architecture	32	2			6
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5181	计算思维 Computational Thinking	32	2			1
	选修 Elective	CST5581	新生实践课 Computer Skills Practice for Freshman	32	1		32	1
	选修 Elective	CST5012	C++ 程序设计 Advanced Programming Language (C++)	40	2.5			3
	选修 Elective	CST5601	C++ 程序设计实验 Advanced Programming Language Experiment (C++)	24	0.75		24	3
	选修 Elective	CST0201	Python 大数据与人工智能实践 Python Big Data and Artificial Intelligence Practice	32	2		16	3
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	CST5491	大数据导论 Big Data Introduction	24	1.5			3
	选修 Elective	CST5211	命令式计算原理 Principles of imperative Computation	32	2			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5021	JAVA 语言程序设计 Advanced Programming Language (JAVA)	40	2.5			4
	选修 Elective	CST5631	JAVA 语言程序设计实验 Advanced Programming Language Experiment (JAVA)	24	0.75		24	4
	选修 Elective	CST5041	Verilog 语言 Verilog Language	32	1			4
	选修 Elective	CST5461	游戏设计与开发概论 Introduction to Game Design and Development	32	2			4
	选修 Elective	CST5611	大数据分析 Big Data Analysis	40	2.5			4
	选修 Elective	CST0071	大数据分析实验 Big Data Analysis Experiments	16	0.5		16	4
	选修 Elective	CST5144	机器学习 Machine Learning	40	2.5			4
	选修 Elective	CST0171	WEB 前端开发 (IT 生态课程) Web Front-end Development	32	2			5
	选修 Elective	CST0191	游戏设计与开发腾讯菁英课 (IT 生态课程) (Tencent Game Design and Development)	32	2			5
	选修 Elective	CST5511	大数据管理 Big Data Management	40	2.5			5
	选修 Elective	CST0101	大数据管理实验 Big Data Management Experiments	16	0.5		16	5
	选修 Elective	CST5522	计算机视觉 Computer Vision	32	2			5
	选修 Elective	CST5281	数值分析 Numerical Analysis	32	2			5
	选修 Elective	CST5171	计算理论 Computing Theory	32	2			5
	选修 Elective	CST5191	接口技术 Computer Interface Techniques	48	3			5
	选修 Elective	CST0021	网络空间安全概论 An Introduction to Cyberspace Security	32	2			5
	选修 Elective	CST5151	计算机图形学 Computer Graphics	32	2			5
	选修 Elective	CST5121	函数式编程原理 Principles of Functional Programming	32	2			5
	选修 Elective	CST0211	企业级工程设计与实践 (IT 生态课程) Enterprise Engineering Design and Practice	32	2			5
	选修 Elective	CST0221	可信软件开发 (IT 生态课程) Trusted Software Development	32	2			6
	选修 Elective	CST5551	自然语言处理 Natural Language Processing	40	2.5			6



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST0111	大数据处理系统 Big Data Processing System	40	2.5			6
	选修 Elective	CST0121	大数据处理系统实验 Big Data Processing System Experiments	16	0.5		16	6
	选修 Elective	CST5231	嵌入式系统 Embedded System	32	2		24	6
	选修 Elective	CST5461	云计算与虚拟化 Cloud Computing and Virtualization	32	2			6
	选修 Elective	CST0031	大数据存储与管理 Big Data Storage System and Management	32	2			6
	选修 Elective	CST5291	数字图像处理 Digital Image Processing	24	1.5			6
	选修 Elective	CST5051	并行编程原理与实践 Parallel Programming Principle and Practice	32	2			6
	选修 Elective	CST5381	信息存储技术 (IT 生态课程) Information Storage Techniques	24	1.5			7
	选修 Elective	CST5301	搜索引擎技术基础 Fundamentals of Search Engine	24	1.5			7
	选修 Elective	CST5431	移动客户端开发 (IT 生态课程) Mobile Client Development	24	1.5			7
	选修 Elective	CST5621	图神经网络导论 Introduction to Graph Neural Networks	32	2			7
	选修 Elective	CST5261	社会网络与计算 Social networking and Computing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练 (七) Engineering Practice Training (VII)	2w	1			4
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			3
	必修 Required	CST3661	硬件综合训练 Project of Hardware System	2w	1			5
	必修 Required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1			6
	必修 Required	CST3601	生产实习 Engineering Internship	3w	1.5			7
	必修 Required	CST3541	系统能力培养综合实践 Comprehensive Training of System Ability	4w	2			7
	选修 Elective	CST3681	科技创新活动 (一) Extracurricular Science and Technology innovation (I)	4w	2			5
	选修 Elective	CST3691	科技创新活动 (二) Extracurricular Science and Technology innovation (II)	4w	2			6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Internship and Practical Training	选修 Elective	CST3701	科技创新活动（三） Extracurricular Science and Technology Innovation （III）	4w	2			7
	必修 Required	CST3511	毕业设计（论文） Undergraduate Thesis	14w	7			8

说明：科技创新活动学分可以作为专业选修学分计算。

## 计算机科学与技术第二主修专业、辅修专业培养计划

### Undergraduate Program for the Second and Auxiliary Specialty in Computer Science and Technology

#### 一、培养目标

##### I . Educational Objectives

培养具有信息学科和计算机学科有关的基础理论知识和应用能力，能在信息技术产业，科研部门，高等院校及其相关领域从事信息科学和技术的研究、设计、开发及管理等方面的工作，具有一定的专业知识和实践动手能力的研究型、复合型人才。

This program provides a grounding theoretical principle and practical skills in the field of information and computer discipline. Graduates can be prepared for any professional role they might choose——research, design, integration, practice in information industries, research institutes, universities, and professions and other community groups. It remains committed to systematic education for high level researchers and doers.

#### 二、学位

##### II . Degree Conferred

工学学士

Bachelor of Engineering

#### 三、学分

##### III . Credits

完成学业最低学分要求：50

Minimum Course Credits : 50

其中：

Including：

学科基础课程：12 学分

Basic Courses in General Discipline : 12

专业课程：31 学分

Basic Courses in Discipline : 31

毕业设计：7 学分

Undergraduate Thesis : 7

## 四、教学进程计划表

## IV. Table of Teaching Schedule

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in Discipline	必修 Required	CST0641	数字电路与逻辑设计 Digital Circuit and Logic Design	80	5			3
	必修 Required	CST2141	计算机组成原理 Principle of Computer Organization	64	4			4
	必修 Required	CST0531	计算机网络 Computer Network	48	3			5
专业课程 Courses in Specialty	必修 Required	CST2161	离散数学 Discrete Mathematics	80	5			3
	必修 Required	CST2261	数据结构 Data Structure	56	3.5			4
	必修 Required	CST5161	计算机系统基础 Introduction to Computer System	48	3			4
	必修 Required	CST2032	操作系统原理 Principle of Operating System	64	4			4
	必修 Required	CST2281	数据库系统原理 Principle of Database System	56	3.5			4
	必修 Required	CST0711	面向对象程序设计 Object oriented Programming	56	3.5			5
	必修 Required	CST5311	算法分析与设计 Algorithmic Design & Analysis	56	3.5			6
	必修 Required	CST2131	计算机系统结构 Computer System Architecture	40	2.5			6
	必修 Required	CST2231	软件工程 Software Engineering	40	2.5			6
实践环节 Internship and Practical Training	必修 Required	CST3511	毕业设计（论文） Undergraduate Thesis	14w	7			6

注：修满 25 学分而不足 50 学分者，可发给辅修证。

If one's credits are more than 25 but less than 50, he can only obtain a certificate of auxiliary specialty.

## 数据科学与大数据专业本科培养计划

### Undergraduate Program for Data Science & Big Data Technology

#### 一、培养目标

##### I . Program Objectives

本专业培养具有社会主义核心价值观、强烈的社会责任感和使命感、适应社会经济和我国信息产业自主可控战略发展需求，扎实的数学、自然科学、工程基础和数据科学与大数据技术专业知识与能力，创新精神与实践能力强，系统能力突出，具有良好人文素养、大工程观、团队精神、国际视野和可持续竞争力，能从事数据科学与大数据领域相关的研究、设计、开发与管理工作，能解决数据科学与大数据领域复杂工程问题的卓越人才。

In this major, whilst upholding the core socialist values and shouldering the strong sense of social responsibility in line with the demand of the economy, society, and China's information industry, students will become research talents in computer science with an excellent command of mathematics, natural science, engineering foundation, data science and Big Data technology expertise and skills. This major also aims to cultivate students with great qualities like strong innovative and practical ability, and computer system design ability, humanistic literacy, the idea of large-scale engineering, team spirit, global vision, and sustainable competitiveness. It is expected that graduates of this program are competent in works related to data science and Big Data technology research, design, development, and management and capable of solving complex engineering project challenges in the field of data science and Big Data technology. After working for about five years, they can become the technical backbone or industry elite of their organization, field, or industry.

#### 二、基本规格要求

##### II . Learning Outcomes

- 1.工程知识：具备数学、自然科学、工程基础和计算机专业知识，并能用于解决数据科学与技术专业复杂工程问题；
- 2.问题分析：能够应用数学、自然科学、工程科学、信息科学以及数据科学与大数据专业的基本原理，识别、表达、并通过文献研究分析计算机复杂工程问题，以获得有效结论；
- 3.设计/开发解决方案：能设计针对数据科学与大数据复杂工程问题的解决方案，设计满足特定需求的系统、模块或算法流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；
- 4.研究：能基于数据科学、计算机科学的基本原理并采用科学方法对大数据复杂工程问题进行研究，通过实验设计、建模仿真、数据分析与解释、模型验证与改进方式，对大数据复杂工程问题进行研究并得到合理有效结论；
- 5.使用现代工具：能够针对数据科学与大数据复杂工程问题设计、预测、模拟与实现的需要，开发、选择与使用恰当的技术、软硬件及系统资源、现代化开发工具，并能够理解所使用工具和资源的局限性
- 6.工程与社会：能够基于工程领域相关背景知识进行合理分析，评价数据科学与大数据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，能理解并承担工程师的社会责任；

7.环境和可持续发展：能理解和评价针对数据科学与大数据复杂工程问题的专业工程实践对环境、社会可持续发展的影响；

8.职业规范：具有良好的人文社会科学素养和社会责任感，能够在专业工程实践中理解并遵守工程职业道德和规范，履行工程师的责任；

9.个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中协同工作，并承担个体、团队成员以及负责人的角色；

10.沟通：能够就数据科学与大数据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，熟悉大数据等信息工程项目管理的基本方法和技术，并能在多学科环境中应用；

12.终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应信息技术新发展的能力。

Students are expected to gain :

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering

management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

以数理为基础，以信息学科为背景，以计算机科学与技术为培养方向，以学术能力培养为中心，以创新能力培养为重点，理论与应用相兼顾，软件与系统相结合，数据科学与大数据工程并重。加强学术氛围，培养学术兴趣，挖掘学术潜力。采用基于问题/项目的教学方法，培养在数据科学与大数据技术的研究、设计、开发和工程组织等方面具有综合能力的学术型人才。

Based on the basis of mathematics and background of information science, directed towards Data Science and Big Data technology, centered in academic ability training, this program emphasizes on innovation spirit, bears theory and application in mind, combines software and hardware education, and balances on computer science and computer engineering. Based on the method of problem-based or project-based learning, this program aims to cultivate academic talents with comprehensive abilities on research, design, development and engineering in the area of Data Science and Big Data technology.

### 四、主干学科

#### IV. Main Disciplines

数据科学与大数据技术 Data Science and Big Data Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Program Length : 4 years

授予学位：工学学士

Degrees Conferred : Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：153.5

Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 153.5

完成学业最低课外学分要求：8

Minimum Extracurricular Credits : 8

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别	课程性质	学时/学分	学时/学分占比 (%)
素质教育通识课程	必修	588/30	19.7/19.5
	选修	160/10	5.4/6.5
学科大类基础课程	必修	616/34.75	20.6/22.6
专业核心课	必修	808/43.25	27/28.2
专业选修课	选修	320/20	10.7/13
集中性实践教学环节	必修	31w/15.5	16.6/10.2
实践教学合计	必修	352+31w/26.5	28.4/17.3
合计		2988/153.5	100/100

华中科技大学 2022 级本科专业培养计划

Course Classified	Course Nature	Hrs/Crs	Hrs/Crs Percentage (%)
Essential-qualities-oriented Education General Courses	Required	588/30	19.7/19.5
	Elective	160/10	5.4/6.5
Basic Courses in General Discipline	Required	616/34.75	20.6/22.6
Common Core Courses	Required	808/43.25	27/28.2
Specialty-Oriented Courses	Elective	320/20	10.7/13
Internship and Practical Training	Required	31w/15.5	16.6/10.2
Practical Teaching Total	Required	352+31w/26.5	28.4/17.3
Total		2988/153.5	100/100

2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	6.5
工程训练	必修	2/1	6.5
生产实习 (社会实践)	必修	3/1.5	9.7
课程设计及综合实践	必修	10/5	32.3
毕业设计 (论文)	必修	14/7	45
合计		31/15.5	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6.5
Electrical Engineering Practice	Required	2/1	6.5
Engineering Internship (Social Practice)	Required	3/1.5	9.7
Course Project	Required	10/5	32.3
Undergraduate Thesis	Required	14/7	45
Total		31/15.5	100

3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3	劳动教育 (必修)	32 学时		2
4	计算机考试 (必修)	CCF 计算机软件能力认证 CSP 成绩 200~500 分		2~5
5	英语考试	CET6	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	4
		雅思考试	达 6.5 分以上者	4
		GRE 考试	达 325 分以上者	4
6	学科竞赛	校级	获 1/2/3 等奖者	2/1/1
		省级	获 1/2/3 等奖者	4/3/3
		全国	获 1/2/3 等奖者	6/5/5
7	讲座	Time 系列讲座	参加 4 次以上	2
8	论文	在国际及全国性会议或期刊发表论文	每篇论文	2~4
9	科研	参与科研项目 (含大创项目)	每项	2~4

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同; 完成洛谷规定编程任务可认定 CSP 成绩 200 分。



华中科技大学 2022 级本科专业培养计划

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and political course Social Practice (Required)	Submit a report and obtain a passing score		2
3	Labor Education (Required)	Public Service (32 hours)		2
4	Computer Examinations (Required)	Certified Software Professional 200-500		2~5
5	English Examinations	CET-6	PASS	2
		TOFEL	90 Points or Higher	4
		IELTS	6.5 Points or Higher	4
		GRE	1350 Points or Higher	4
6	Competitions	University Level	Win 1st/2nd/3rd prize	2/1/1
		Provincial Level	Win 1st/2nd/3rd prize	4/3/3
		National Level	Win 1st/2nd/3rd prize	6/5/5
7	Lectures	TIME Lecture series	A minimum of 4 times	2
8	Academic papers	International conference or national publications	Per piece	2~4
9	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	2~4

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 专业主干课 Main Courses in Specialty

C 语言程序设计 Advanced Programming Language (C), 离散数学 Discrete Mathematics、数据结构 Data Structure、逻辑与计算机系统设计基础 Logic and computer design Fundamentals、计算机系统基础 Introduction to computer systems、操作系统原理 Operating System、数据库系统原理 Database System、大数据分析 Big data Analysis、大数据管理 Big Data Management、数据可视化技术 Data visualization technology、大数据处理 Big Data Processing 等。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

1. 创新(创业)意识启迪课程 Innovation (Entrepreneurship) Awareness Enlightenment Courses  
信息技术导论 (IT 中国) (必修) Introduction to Information Technology, 素质教育通识课程中选修至少 1 学分的创业类课程。

2. 创新(创业)能力培养课程 Innovation (Entrepreneurship) Ability Training Courses  
操作系统原理 Operating System、数据库系统原理 Database System、大数据分析 Big Data Analytic

3. 创新(创业)实践培养课程 Innovation Practice Training Courses  
大数据系统综合实践 Comprehensive training of Big Data system、数据可视化技术 Data visualization technology

## 八、主要实践教学环节（含专业实验）

## VIII. Practicum Module (experiments included)

工程训练 Electrical Engineering Practice、程序设计综合课程设计 Course Project of Programming、操作系统课程设计 Course Project of Operating System、生产实习 Engineering Internship、大数据算法综合实践 Comprehensive training of Big Data Algorithmic、大数据系统综合实践 Comprehensive Training of Big Data system、毕业设计 Undergraduate Thesis.

## 九、教学进程计划表

## IX. Course schedule

院（系）：计算机科学与技术学院

专业：计算机科学与技术

School (Department) : School of Computer Science &amp; Technology

Major: Computer Science &amp; Technology

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			4-6
	必修 Required	CH0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
			从不同公选模块中选修不低于 10 学分的课程（其中美育类不低于 2 学分，经济与管理类不少于 2 学分，思维与方法类不少于 1 学分，《大学生心理健康》必修） General Education Courses(elective)	160	10			

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础课程 Basic Courses in General Discipline	必修 Required	CST0721	信息技术导论 (IT 中国) Introduction to Information Technology	24	1.5			1
	必修 Required	CST0511	C 语言程序设计 Advanced Programming Language (C)	48	3			1
	必修 Required	CST0521	C 语言程序设计实验 Advanced Programming Language Experiments	32	1		32	1
	必修 Required	MAT0551	微积分 (一) 上 Calculus (I)	88	5.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0551	物理实验 (一) Physical Experiments (I)	32	1	32		2
	必修 Required	MAT0531	微积分 (一) 下 Calculus (I)	88	5.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			5
	必修 Required	CST0551	计算机通信与网络实验 Computer Telecommunications & Network Experiments	32	1		32	5
专业核心课程 Specialty Required Courses	必修 Required	CST2171	离散数学 (一) Discrete Mathematics (I)	40	2.5			2
	必修 Required	CST2261	数据结构 Data Structure	48	3			2
	必修 Required	CST2272	数据结构实验 Data Structure Experiments	32	1		32	2
	必修 Required	CST2161	离散数学 (二) Discrete Mathematics (II)	40	2.5			3
	必修 Required	CST2261	算法设计与分析 Algorithmic Design & Analysis	32	2			3
	必修 Required	CST2421	算法设计与分析实践 Algorithmic Design & Analysis	24	0.75		24	3
	必修 Required	CST5161	计算机系统基础 Introduction of Computer System	40	2.5			3
	必修 Required	CST0041	计算机系统基础实验 Introduction of Computer System Experiments	32	1		32	3
	必修 Required	CST0051	逻辑与计算机设计 Logic and Computer System Design	64	4			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	CST0061	逻辑与计算机设计实践 Experiments of Logic and Computer Design	32	1		32	4
	必修 Required	CST2281	数据库系统原理 Database System	48	3			4
	必修 Required	CST2291	数据库系统原理实践 Database System Experiments	32	1		32	4
	必修 Required	CST5611	大数据分析 Big Data Analysis	40	2.5			4
	必修 Required	CST0071	大数据分析实验 Big Data Analysis Experiments	16	0.5		16	4
	必修 Required	CST2032	操作系统原理 Operating System	48	3			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5		16	5
	必修 Required	CST2231	软件工程 Software Engineering	32	2			5
	必修 Required	CST0081	数据可视化技术 Data Visualization Technology	32	2			5
	必修 Required	CST0091	数据可视化技术实验 Data Visualization Technology Experiments	16	0.5		16	5
	必修 Required	CST5511	大数据管理 Big Data Management	40	2.5			5
	必修 Required	CST0101	大数据管理实验 Big Data Management Experiments	16	0.5		16	5
	必修 Required	CST0111	大数据处理系统 Big Data Processing System	40	2.5			6
	必修 Required	CST0121	大数据处理系统实验 Big Data Processing System Experiments	16	0.5		16	6
	必修 Required	CST2131	计算机系统结构 Computer Architecture	32	2			6
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5181	计算思维 Computational Thinking	32	2			1
	选修 Elective	CST5581	新生实践课 Computer Skills Practice for Freshman	32	1		32	1
	选修 Elective	CST5012	C++ 程序设计 Advanced Programming Language (C++)	40	2.5			3
	选修 Elective	CST5601	C++ 程序设计实验 Advanced Programming Language Experiment (C++)	24	0.75		24	3
	选修 Elective	CST0201	Python 大数据与人工智能实践 Python Big Data and Artificial Intelligence Practice	32	2		16	3
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5491	大数据导论 Big Data Introduction	24	1.5			3
	选修 Elective	CST5211	命令式计算原理 Principles of Imperative Computation	32	2			4
	选修 Elective	CST5021	JAVA 语言程序设计 Advanced Programming Language (JAVA)	40	2.5			4
	选修 Elective	CST5631	JAVA 语言程序设计实验 Advanced Programming Language Experiment (JAVA)	24	0.75		24	4
	选修 Elective	CST5041	Verilog 语言 Verilog language	32	1			4
	选修 Elective	CST5461	游戏设计与开发概论 Introduction to Game Design and Development	32	2			4
	选修 Elective	CST5144	机器学习 Machine Learning	40	2.5			4
	选修 Elective	CST0171	WEB 前端开发 (IT 生态课程) Web Front-end Development	32	2			5
	选修 Elective	CST0191	游戏设计与开发腾讯菁英课 (IT 生态课程) (Tencent Game Design and Development)	32	2			5
	选修 Elective	CST5522	计算机视觉 Computer Vision	32	2			5
	选修 Elective	CST5281	数值分析 Numerical Analysis	32	2			5
	选修 Elective	CST5171	计算理论 Computing Theory	32	2			5
	选修 Elective	CST5191	接口技术 Computer Interface Techniques	48	3			5
	选修 Elective	CST0021	网络空间安全概论 An Introduction to Cyberspace Security	32	2			5
	选修 Elective	CST5151	计算机图形学 Computer Graphics	32	2			5
	选修 Elective	CST5121	函数式编程原理 Principles of Functional Programming	32	2			5
	选修 Elective	CST0211	企业级工程设计与实践 (IT 生态课程) Enterprise Engineering Design and Practice	32	2			5
	选修 Elective	CST0221	可信软件开发 (IT 生态课程) Trusted Software Development	32	2			6
	选修 Elective	CST5551	自然语言处理 Natural Language Processing	40	2.5			6
	选修 Elective	CST5231	嵌入式系统 Embedded System	32	2		24	6
	选修 Elective	CST5461	云计算与虚拟化 Cloud Computing and Virtualization	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST0031	大数据存储与管理 Big Data Storage System and Management	32	2			6
	选修 Elective	CST5291	数字图像处理 Digital Image Processing	24	1.5			6
	选修 Elective	CST5051	并行编程原理与实践 Parallel Programming Principle and Practice	32	2			6
	选修 Elective	CST5381	信息存储技术 (IT 生态课程) Information Storage Techniques	24	1.5			7
	选修 Elective	CST5301	搜索引擎技术基础 Fundamentals of Search Engine	24	1.5			7
	选修 Elective	CST5431	移动客户端开发 (IT 生态课程) Mobile Client Development	24	1.5			7
	选修 Elective	CST5621	图神经网络导论 Introduction to Graph Neural Networks	32	2			7
	选修 Elective	CST5261	社会网络与计算 Social Networking and Computing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练 (七) Engineering Practice Training (VII)	2w	1			4
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			3
	必修 Required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1			6
	必修 Required	CST0131	大数据算法综合实践 Comprehensive Training of Big Data Algorithmic	2w	1			6
	必修 Required	CST3601	生产实习 Engineering Internship	3w	1.5			7
	必修 Required	CST0141	大数据系统综合实践 Comprehensive Training of Big Data System	4w	2			7
	选修 Elective	CST3681	科技创新活动 (一) Extracurricular Science and Technology Innovation (I)	4w	2			5
	选修 Elective	CST3691	科技创新活动 (二) Extracurricular Science and Technology Innovation (II)	4w	2			6
	选修 Elective	CST3701	科技创新活动 (三) Extracurricular Science and Technology Innovation (III)	4w	2			7
	必修 Required	CST3511	毕业设计 (论文) (硕士阶段研究环节) Undergraduate Thesis	14w	7			8

说明：科技创新活动学分可以作为专业选修学分计算。

## 物联网工程专业本科培养计划

### Undergraduate Program for Internet of Things Engineering

#### 一、培养目标

##### I . Educational Objectives

本专业培养具有社会主义核心价值观、强烈社会责任感、适应社会经济和我国信息产业发展需求，具有系统、扎实的信息学科理论基础，在物联网信息的获取、传输、处理及应用等方面，具有较宽广的专业知识和实践动手能力的研究型、复合型人才。毕业生具有良好的人文素质、创新精神和较强的英语能力，能在物联网技术产业、科研部门、高等院校及其相关领域从事研究、设计、开发及管理等方面的工作，并可继续攻读计算机科学与技术以及相关学科的硕士博士学位。

This program is designed to provide students all round development of morality, intelligence and physique, make them possess a systemic and solid theory foundation, and foster research-oriented, inter-disciplinary talents in the field of Internet of Things. After that, they will have good human qualities, innovative spirit and strong English ability. They can not only qualify for research, design, development and management in the technology industries of Internet of Things, research institutes, universities and other related fields, but also further pursue their advanced degrees in the Internet of Things engineering, the computer science and technology and other related subjects.

#### 二、基本规格要求

##### II . Learning Outcomes

1. 具有解决本学科复杂工程问题所需的扎实数理基础、自然科学及工程知识，掌握计算机科学与技术学科基本理论和专业知识。
2. 具有分析本学科复杂工程问题的能力。能发现、阐明计算机科学与技术复杂工程问题，并能利用所学数理知识、自然科学知识、工程知识、专业知识，通过文献研究对复杂工程问题进行抽象表示、分析、建模并得出结论。
3. 具有为本学科复杂工程问题设计/开发解决方案的能力。设计针对本学科复杂工程问题的解决方案，包括设计满足特定需求的系统、单元（模块）或设计开发流程，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。
4. 具有调查研究能力。掌握基本的科学研究与创新方法，能够基于科学原理、科学方法和专业知识对复杂工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到有效的结论。
5. 具有灵活使用现代工具的能力。能够在实际复杂工程活动中选择合适的开发工具、开发模式、和测试技术，并灵活运用各种现代工具对复杂工程问题进行设计、模拟与实现，且能够理解不同工具的局限性。
6. 能够基于本专业相关背景知识进行合理分析，评价本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。
7. 能够理解和评价针对复杂工程问题的专业工程实践对环境保护、社会可持续发展的影响。
8. 具有良好的人文素质和社会责任感，掌握马列主义、毛泽东思想与中国特色社会主义基本理论；具有良好的工程素质与职业道德，了解并遵守与本专业相关的行业生产、设计、研究与开发政策、法律、法规。
9. 具有组织管理能力与团队协作精神。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，能在不同团队或多学科环境中有效发挥作用。

10. 具有较强的交流与沟通能力。具有一定的外语应用能力，能阅读本专业的外文资料。具备一定的国际视野，能够在跨文化背景下进行沟通交流，能够就复杂工程问题与业界同行及社会公众进行有效沟通与交流，包括撰写报告和设计文稿、陈述发言、清晰表达。

11. 具有一定的计算机工程项目管理能力，能理解并掌握工程管理原理，与经济决策方法，能选择合适的计算机工程项目开发管理模式，并能在多学科环境中应用。

12. 具有终身学习意识与能力。对终身学习有正确认识，具有自主学习和终身学习的意识，能运用现代信息技术获取相关信息和新技术、新知识。

Students are expected to gain :

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



### 三、培养特色

#### III. Program Highlights

以数理为基础，以信息学科为平台，以物联网工程为方向，培养具有良好科学素养，系统地掌握物联网基础理论、系统知识和基本技能，从事物联网领域的科学研究、系统分析、系统设计、技术开发、管理等方面的高级专门技术人才。

Based on math and science, built on information science, directed towards Internet of Things, this program is committed to train students to become talented professionals with a sound theoretic foundation, systematical knowledge and skills, of the capability to carry out the scientific research, system analysis, system design, technical development, and management in the field of the Internet of Things.

### 四、主干学科

#### IV. Main Discipline

物联网工程 the Internet of Things Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Program Length: 4 years

授予学位：工学学士

Degrees Conferred : Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：143.75 学分

Minimum Credits of Curricular (Comprising the course system and the intensive practical training) : 143.75 credits

完成学业最低课外学分要求：6 学分

Minimum Extracurricular Credits : 6 credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别	课程性质	学时/学分	学时/学分占比 (%)
素质教育通识课程	必修	588/30	20.8/20.9
	选修	160/10	5.7/7
学科大类基础课程	必修	608/34.75	21.5/24.2
专业核心课	必修	688/35.5	24.3/24.7
专业选修课	选修	288/18	10.2/12.5
集中性实践教学环节	必修	31w/15.5	17.5/10.7
实践教学合计	必修	344+31w/26.25	29.7/18.3
合计		2828/143.75	100/100

Course Classified	Course Nature	Hrs/Crs	Hrs/Crs Percentage (%)
Essential-qualities-oriented Education General Courses	Required	588/30	20.8/20.9
	Elective	160/10	5.7/7
Basic Courses in General Discipline	Required	608/34.75	21.5/24.2
Common Core Courses	Required	688/35.5	24.3/24.7
Specialty-Oriented Courses	Elective	288/18	10.2/12.5
Internship and Practical Training	Required	31w/15.5	17.5/10.7
Practical Teaching Total	Required	344+31w/26.25	29.7/18.3
Total		2828/143.75	100/100

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例(%)
军事训练	必修	2/1	6.5
工程训练	必修	2/1	6.5
企业实训/综合+生产实习	必修	3/1.5	9.7
课程设计	必修	10/5	32.3
毕业设计(论文)	必修	14/7	45
合计		31w/15.5	100

Course Credits	Required/elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6.5
Electrical Engineering Practice	Required	2/1	6.5
Engineering Internship/comprehensive Training Professional Practice	Required	3/1.5	9.7
Course Project	Required	10/5	32.3
Undergraduate Thesis	Required	14/7	45
Total		31w/15.5	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	社会实践	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
2	思政课社会实践(必修)	提交调查报告, 取得成绩	2
3	劳动教育(必修)	32 学时	2
4	计算机考试(必修)	CCF 计算机软件能力认证 CSP 成绩 200~500 分	2~5
5	英语考试	CET6	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
6	学科竞赛	校级	获 1/2/3 等奖者
		省级	获 1/2/3 等奖者
		全国	获 1/2/3 等奖者
7	讲座	Time 系列讲座	参加 4 次以上
8	论文	在国际及全国性会议或期刊发表论文	每篇论文
9	科研	参与科研项目(含大创项目)	每项

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同; 完成洛谷规定编程任务可认定 CSP 成绩 200 分。

No.	Extracurricular Activities and Social Practice	Requirements	Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense	2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province	2
2	Ideological and political course Social Practice (Required)	Submit a report and obtain a passing score	2

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
3	Labor Education (Required)	Public Service (32 hours)		2
4	Computer Examinations (Required)	Certified Software Professional 200-500		2~5
5	English Examinations	CET-6	PASS	2
		TOFEL	90 Points or Higher	4
		IELTS	6.5 Points or Higher	4
		GRE	1350 Points or Higher	4
6	Competitions	University Level	Win 1st/2nd/3rd prize	2/1/1
		Provincial Level	Win 1st/2nd/3rd prize	4/3/3
		National Level	Win 1st/2nd/3rd prize	6/5/5
7	Lectures	TIME Lecture series	A minimum of 4 times	2
8	Academic papers	International conference or national publications	Per piece	2~4
9	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	2~4

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

C 语言程序设计 C Programming Language、数据结构 Data Structure、数字电路与逻辑设计 Digital Circuit and Logic Design、计算机组成原理 Computer Organization、嵌入式操作系统原理 Embedded Operating System、数据库系统原理及应用 Database System Principle and Application、射频识别技术与应用 RFID Technology and Application、传感器原理及应用 Sensor Principle and Application、物联网通信技术 Communication Technology of IOT、物联网中间件 Middleware Technology of IOT、物联网安全概论 Introduction to IOT Security。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

1. 创新（创业）意识启迪课程 Innovation (Entrepreneurship) Awareness Enlightenment Courses

信息技术导论 (IT 中国) (必修) Introduction to Information Technology, 素质教育通识课程中选修至少 1 学分的创业类课程、人工智能导论 (选修) Artificial Intelligence、大数据导论 (选修) Big Data Introduction

2. 创新（创业）能力培养课程 Innovation (Entrepreneurship) Ability Training Courses  
射频识别技术与应用 RFID Technology and Application、传感器原理及应用 Sensor Principle and Application

3. 创新（创业）实践培养课程 Innovation Practice Training Courses  
物联网应用系统综合设计 Project of Application system design of IOT

(二) 创新（创业）课程 Innovation (Entrepreneurship) Courses  
物联网应用系统综合设计 Project of Application system design of IOT

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

工程训练 Engineering Training、程序设计综合课程设计 Course Project of Programming、硬件综合训练 Project of Hardware System、嵌入式操作系统课程设计 Course Project in Operating System、射频识别技术与应用课程实验 RFID and Application Experiments、传感器技术原理及应用课程实验 Sensor principle and application Experiments、物联网应用系统综合设计 Project of Application system design of IOT、生产实习 Engineering Internship、毕业设计 Undergraduate Thesis 等。

## 九、教学进程计划表

### IX. Course Schedule

院（系）：计算机科学与技术学院

专业：物联网工程

School (Department) : School of Computer Science & Technology

Major: Internet of Things Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			4-6
	必修 Required	CH0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
			从不同公选模块中选修不低于 10 学分的课程(其中美育类不低于 2 学分,经济与管理类不少于 2 学分,思维与方法类不少于 1 学分,《大学生心理健康》必修) General Education Courses (elective)	160	10			2-8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础课程 Basic Courses in General Discipline	必修 Required	CST0721	信息技术导论 (IT 中国) Introduction to Information Technology	24	1.5			1
	必修 Required	CST0511	C 语言程序设计 Advanced Programming Language (C)	48	3			1
	必修 Required	CST0521	C 语言程序设计实验 Advanced Programming Language Experiments	32	1		32	1
	必修 Required	MAT0551	微积分 (一) 上 Calculus (I)	88	5.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0551	物理实验 (一) Physical Experiments (I)	32	1	32		2
	必修 Required	MAT0531	微积分 (一) 下 Calculus (I)	88	5.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	CST0641	数字电路与逻辑设计 (一) Digital Circuit and Logic Design (I)	48	3			3
	必修 Required	CST0651	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5		16	3
	必修 Required	CST2171	离散数学 (一) Discrete Mathematics (I)	40	2.5			2
专业核心课程 Specialty Required Courses	必修 Required	CST2261	数据结构 Data Structure	48	3			2
	必修 Required	CST2272	数据结构实验 Data Structure Experiments	32	1		32	2
	必修 Required	CST0591	接口技术与汇编语言 Interface Techniques and Assembly Language	32	2			4
	必修 Required	CST0601	接口技术与汇编语言实验 Interface Techniques and Assembly Language Experiments	32	1		32	4
	必修 Required	CST2141	计算机组成原理 Computer Organization	48	3			4
	必修 Required	CST2151	计算机组成原理实验 Computer Organization Experiments	16	0.5		16	4
	必修 Required	CST2281	数据库系统原理 Database System	48	3			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	CST2291	数据库系统原理实践 Database System Experiments	32	1		32	4
	必修 Required	CST0621	嵌入式操作系统原理 Embedded Operating System	48	3			5
	必修 Required	CST0631	嵌入式操作系统原理实验 Embedded Operating System Experiments	16	0.5		16	5
	必修 Required	CST2231	软件工程 Software Engineering	32	2			5
	必修 Required	CST2321	物联网通信技术 Communication Technology of IOT	64	4			5
	必修 Required	CST2331	物联网通信技术实验 Communication Technology Experiments of IOT	48	1.5		48	5
	必修 Required	CST2051	传感器原理及应用 Sensor Principle and Application	32	2			6
	必修 Required	CST2061	传感器原理及应用实验 Sensor Principle and Application Experiments	32	1		32	6
	必修 Required	CST2241	射频识别技术与应用 RFID and Application	32	2			6
	必修 Required	CST2251	射频识别技术与应用实验 RFID and Application Experiments	32	1		32	6
	必修 Required	CST2341	物联网中间件技术 Middleware Technology of IOT	24	1.5			6
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5181	计算思维 Computational Thinking	32	2			1
	选修 Elective	CST5581	新生实践课 Computer Skills Practice for Freshman	32	1		32	1
	选修 Elective	CST5012	C++ 程序设计 Advanced Programming Language (C++)	40	2.5			3
	选修 Elective	CST5601	C++ 程序设计实验 Advanced Programming Language Experiment (C++)	24	0.75		24	3
	选修 Elective	CST0201	Python 大数据与人工智能实践 Python Big Data and Artificial Intelligence Practice	32	2		16	3
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	CST5491	大数据导论 Big Data Introduction	24	1.5			3
	选修 Elective	CST5211	命令式计算原理 Principles of Imperative Computation	32	2			4
	选修 Elective	CST5021	JAVA 语言程序设计 Advanced Programming Language (JAVA)	40	2.5			4
	选修 Elective	CST5631	JAVA 语言程序设计实验 Advanced Programming Language Experiment (JAVA)	24	0.75		24	4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5041	Verilog 语言 Verilog language	32	1			4
	选修 Elective	CST5461	游戏设计与开发概论 Introduction to Game Design and Development	32	2			4
	选修 Elective	CST5611	大数据分析 Big Data Analysis	40	2.5			4
	选修 Elective	CST5144	机器学习 Machine Learning	40	2.5			4
	选修 Elective	CST0171	WEB 前端开发 (IT 生态课程) Web Front-end Development	32	2			5
	选修 Elective	CST0191	游戏设计与开发腾讯菁英课 (IT 生态课程) (Tencent Game Design and Development)	32	2			5
	选修 Elective	CST5511	大数据管理 Big Data Management	40	2.5			5
	选修 Elective	CST5522	计算机视觉 Computer Vision	32	2			5
	选修 Elective	CST5281	数值分析 Numerical Analysis	32	2			5
	选修 Elective	CST5171	计算理论 Computing Theory	32	2			5
	选修 Elective	CST5191	接口技术 Computer Interface Techniques	48	3			5
	选修 Elective	CST0021	网络空间安全概论 An Introduction to Cyberspace Security	32	2			5
	选修 Elective	CST5151	计算机图形学 Computer Graphics	32	2			5
	选修 Elective	CST5121	函数式编程原理 Principles of Functional Programming	32	2			5
	选修 Elective	CST0211	企业级工程设计与实践 (IT 生态课程) Enterprise Engineering Design and Practice	32	2			5
	选修 Elective	CST0221	可信软件开发 (IT 生态课程) Trusted Software Development	32	2			6
	选修 Elective	CST5551	自然语言处理 Natural Language Processing	40	2.5			6
	选修 Elective	CST5241	大数据处理 Big Data Processing	40	2.5			6
	选修 Elective	CST5231	嵌入式系统 Embedded System	32	2	24		6
	选修 Elective	CST5461	云计算与虚拟化 Cloud Computing and Virtualization	32	2			6
	选修 Elective	CST0031	大数据存储与管理 Big Data Storage System and Management	32	2			6
	选修 Elective	CST5291	数字图像处理 Digital Image Processing	24	1.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5051	并行编程原理与实践 Parallel Programming Principle and Practice	32	2			6
	选修 Elective	CST5381	信息存储技术 (IT 生态课程) Information Storage Techniques	24	1.5			7
	选修 Elective	CST5301	搜索引擎技术基础 Fundamentals of Search Engine	24	1.5			7
	选修 Elective	CST5431	移动客户端开发 (IT 生态课程) Mobile Client Development	24	1.5			7
	选修 Elective	CST5621	图神经网络导论 Introduction to Graph Neural Networks	32	2			7
	选修 Elective	CST5261	社会网络与计算 Social Networking and Computing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练 (七) Engineering Practice Training (VII)	2w	1			4
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			3
	必修 Required	CST3581	嵌入式操作系统课程设计 Course Project of Embedded System	2w	1			5
	必修 Required	CST3661	硬件综合训练 Project of Hardware System	2w	1			5
	必修 Required	CST3601	生产实习 Engineering Internship	3w	1.5			7
	必修 Required	CST3631	物联网应用系统综合设计 Course Project of IOT Application System	4w	2			7
	选修 Elective	CST3681	科技创新活动 (一) Extracurricular Science and Technology Innovation (I)	4w	2			5
	选修 Elective	CST3691	科技创新活动 (二) Extracurricular Science and Technology Innovation (II)	4w	2			6
	选修 Elective	CST3701	科技创新活动 (三) Extracurricular Science and Technology Innovation (III)	4w	2			7
	必修 Required	CST3511	毕业设计 Undergraduate Thesis	14w	7			8

说明：科技创新活动学分可以作为专业选修学分计算。



## 计算机科学与技术卓越工程师本科培养计划

### Undergraduate Experimental Program in Computer Science and Technology for Exemplary Engineer Education

#### 一、培养目标

##### I . Program Objectives

本专业培养具有社会主义核心价值观、强烈社会责任感、适应社会经济和我国信息产业发展需求，扎实的数学、自然科学、工程基础和计算机科学与技术专业知识与能力，创新精神与实践能力强，系统能力与工程实践能力突出，具有良好人文素养、大工程观、团队精神、国际视野和可持续竞争力。毕业后能从事计算机领域相关的研究、设计、开发与管理工作，能解决计算机领域复杂工程问题。工作五年左右，可成为单位、领域或行业的技术骨干或业界精英。

In this major, whilst upholding the core socialist values and shouldering the strong sense of social responsibility in line with the demand of economy, society and China's information industry, the students will become the research talents in computer science with an excellent command of mathematics, natural science, engineering foundation, computer science and technology expertise and skills and great qualities of innovation, practical ability, and computer system design ability who are also refined in humanistic literacy, the idea of large-scale engineering, team spirit, global vision and sustainable competitive edge. It is expected that the graduates of the program are competent in the works related to research, design, development and management and capable to solve the complex engineering project challenges in the field of computer science, which will enable them to become the backbone of their organizations and the best of the brightest in the industry after about five-year's work experience.

#### 二、基本规格要求

##### II . Learning Outcomes

1. 工程知识：具备数学、自然科学、工程基础和计算机专业知识，并能用于解决计算机复杂工程问题；

2. 问题分析：能够应用数学、自然科学、工程科学以及计算机科学的基本原理，识别、表达、并通过文献研究分析计算机复杂工程问题，以获得有效结论；

3. 设计/开发解决方案：能设计针对计算机复杂工程问题的解决方案，设计满足特定需求的系统、模块或算法流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；

4. 研究：能基于计算机科学原理并采用科学方法对计算机复杂工程问题进行研究，通过实验设计、建模仿真、数据分析与解释、模型验证与改进方式，对计算机复杂工程问题进行研究并得到合理有效结论；

5. 使用现代工具：能够针对计算机复杂工程问题设计、预测、模拟与实现的需要，开发、选择与使用恰当的技术、软硬件及系统资源、现代化开发工具，并能够理解所使用工具和资源的局限性

6. 工程与社会：能够基于工程领域相关背景知识进行合理分析，评价计算机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，能理解并承担工程师的社会

责任;

7. 环境和可持续发展：能理解和评价针对计算机领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响;

8. 职业规范：具有良好的人文社会科学素养和社会责任感，能够在计算机工程实践中理解并遵守工程职业道德和规范，履行工程师的责任;

9. 个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中协同工作，并承担个体、团队成员以及负责人的角色;

10. 沟通：能够就计算机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，熟悉计算机工程项目管理的基本方法和技术，并能在多学科环境中应用;

12. 终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应信息技术新发展的能力。

Students are expected to gain :

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

以数理为基础，以信息学科为背景，以计算机科学与技术为培养方向，以学术能力培养为中心，以创新能力培养为重点，理论与应用相兼顾，软件与系统相结合，计算机科学与计算机工程并重。加强学术氛围，培养学术兴趣，挖掘学术潜力。采用基于问题/项目的教学方法，培养在计算机软件与理论、系统结构、人工智能的研究、设计、开发和工程组织等方面具有综合能力的学术型人才。

Based on the basis of mathematics and background of information science, directed towards computer science and technology, centered in academic ability training, this program emphasizes on innovation spirit, bears theory and application in mind, combines software and hardware education, and balances on computer science and computer engineering. Based on the method of problem-based or project-based learning, this program aims to cultivate academic talents with comprehensive abilities on research, design, development and engineering in the area of computer theory and software, systems and artificial intelligence.

### 四、主干学科

#### IV. Main Disciplines

计算机科学与技术 Computer Science & Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration：4 years

授予学位：工学学士

Degrees Conferred：Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：153.5 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training)：153.5 credits

完成学业最低课外学分要求：8 学分

Minimum Extracurricular Credits：8 credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别	课程性质	学时/学分	学时/学分占比 (%)
素质教育通识课程	必修	588/30	19.1/19.5
	选修	160/10	5.2/6.5
学科大类基础课程	必修	744/42.25	24.2/27.5
专业核心课	必修	640/34.25	20.8/22.3
专业选修课	选修	320/20	10.4/13

续表

课程类别	课程性质	学时/学分	学时/学分占比 (%)
集中性实践教学环节	必修	39w/17	20.3/11.2
实践教学合计	必修	320+39w/27	30.7/17.6
合计		3076/153.5	100/100

Course Classified	Course Nature	Hrs/Crs	Hrs/Crs Percentage (%)
Essential-qualities-oriented Education General Courses	Required	588/30	19.1/19.5
	Elective	160/10	5.2/6.5
Basic Courses in General Discipline	Required	744/42.25	24.2/27.5
Common Core Courses	Required	640/34.25	20.8/22.3
Specialty-Oriented Courses	Elective	320/20	10.4/13
Internship and Practical Training	Required	39w/17	20.3/11.2
Practical Teaching Total	Required	320+39w/27	30.7/17.6
Total		3076/153.5	100/100

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5.9
工程训练	必修	2/1	5.9
企业实训/综合+生产实习	必修	15/5	29.4
课程设计	必修	6/3	17.6
毕业设计 (论文)	必修	14/7	41.2
合计		39/17	100

Course Credits	Required/elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.9
Electrical Engineering Practice	Required	2/1	5.9
Engineering Internship/comprehensive Training Professional Practice	Required	15/5	29.4
Course Project	Required	6/3	17.6
Undergraduate Thesis	Required	14/7	41.2
Total		39/17	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	社会实践	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩	2
3	劳动教育 (必修)	32 学时	2
4	计算机考试 (必修)	CCF 计算机软件能力认证 CSP 成绩 200~500 分	2~5
5	英语考试	CET6	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
6	学科竞赛	校级	获 1/2/3 等奖者
		省级	获 1/2/3 等奖者
		全国	获 1/2/3 等奖者
7	讲座	Time 系列讲座	参加 4 次以上
8	论文	在国际及全国性会议或期刊发表论文	每篇论文
9	科研	参与科研项目 (含大创项目)	每项

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同; 完成洛谷规定编程任务可认定 CSP 成绩 200 分。

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No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and political course Social Practice (Required)	Submit a report and obtain a passing score		2
3	Labor Education (Required)	Public Service (32 hours)		2
4	Computer Examinations (Required)	Certified Software Professional 200-500		2~5
5	English Examinations	CET-6	PASS	2
		TOFEL	90 Points or Higher	4
		IELTS	6.5 Points or Higher	4
		GRE	1350 Points or Higher	4
6	Competitions	University Level	Win 1st/2nd/3rd prize	2/1/1
		Provincial Level	Win 1st/2nd/3rd prize	4/3/3
		National Level	Win 1st/2nd/3rd prize	6/5/5
7	Lectures	TIME Lecture series	A minimum of 4 times	2
8	Academic papers	International conference or national publications	Per piece	2~4
9	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	2~4

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 专业主干课 Main Courses in Specialty

C 语言程序设计 Advanced Programming Language (C)、离散数学 Discrete Mathematics、数据结构 Data Structure、数字电路与逻辑设计 Digital Circuit and Logic Design、操作系统原理 Operating System、数据库系统原理 Database System、计算机组成原理 Computer Organization、软件工程 Software Engineering 计算机通信与网络 Computer Telecommunications & Network、编译原理 Compiler Principles、计算机系统结构 Computer Architecture 等。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

1. 创新（创业）意识启迪课程 Innovation (Entrepreneurship) Awareness Enlightenment Courses

信息技术导论 (IT 中国) (必修) Introduction to Information Technology, 素质教育通识课程中选修至少 1 学分的创业类课程、人工智能导论 (选修) Artificial Intelligence、大数据导论 (选修) Big Data Introduction

2. 创新（创业）能力培养课程 Innovation (Entrepreneurship) Ability Training Courses  
操作系统原理 Operating System、数据库系统原理 Database System、计算机组成原理 Computer Organization

3. 创新（创业）实践培养课程 Innovation Practice Training Courses

硬件综合训练 Project of Hardware System、企业实训工程实践 I Enterprise Project

## 八、主要实践教学环节（含专业实验）

## VIII. Practical Module (experiments Included)

工程训练 Engineering Training、程序设计综合课程设计 Course Project of Programming、操作系统课程设计 Course Project of Operating System、硬件综合训练 Project of Hardware System、企业实训 工程实践 I Enterprise Project，企业工程实践/毕业设计（论文） Enterprise Project/Undergraduate Thesis

## 九、教学进程计划表

## IX. Course schedule

院（系）：计算机科学与技术学院

专业：计算机科学与技术

School (Department) : School of Computer Science &amp; Technology

Major: Computer Science &amp; Technology

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			4-6
	必修 Required	CH0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
			从不同公选模块中选修不低于 10 学分的课程（其中美育类不低于 2 学分，经济与管理类不少于 2 学分，思维与方法类不少于 1 学分，《大学生心理健康》必修） General Education Courses(elective)	160	10			2-8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础课程 Basic Courses in General Discipline	必修 Required	CST0721	信息技术导论 (IT 中国) Introduction to Information Technology	24	1.5			1
	必修 Required	CST0511	C 语言程序设计 Advanced Programming Language (C)	48	3			1
	必修 Required	CST0521	C 语言程序设计实验 Advanced Programming Language Experiments	32	1		32	1
	必修 Required	MAT0001	高等数学 (A) 上 Calculus (A)	88	5.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0551	物理实验 (一) Physical Experiments (I)	32	1	32		2
	必修 Required	MAT0011	高等数学 (A) 下 Calculus (A)	88	5.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	EEE0641	电路理论 (三) Circuit Theory (III)	64	4			3
	必修 Required	CST0641	数字电路与逻辑设计 (一) Digital Circuit and Logic Design (I)	48	3			3
	必修 Required	CST0651	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5		16	3
	必修 Required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			5
	必修 Required	CST0551	计算机通信与网络实践 Computer Telecommunications & Network Experiments	32	1	32		5
专业核心课程 Specialty Required Courses	必修 Required	CST2171	离散数学 (一) Discrete Mathematics (I)	40	2.5			2
	必修 Required	CST2261	数据结构 Data Structure	48	3			2
	必修 Required	CST2272	数据结构实验 Data Structure Experiments	32	1		32	2
	必修 Required	CST2161	离散数学 (二) Discrete Mathematics (II)	40	2.5			3
	必修 Required	CST2261	算法设计与分析 Algorithmic Design & Analysis	32	2			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	CST2421	算法设计与分析实践 Algorithmic Design & Analysis	24	0.75		24	3
	必修 Required	CST5161	计算机系统基础 Introduction of Computer System	40	2.5			4
	必修 Required	CST0041	计算机系统基础实验 Introduction of Computer System Experiments	32	1		32	4
	必修 Required	CST2141	计算机组成原理 Computer Organization	48	3			4
	必修 Required	CST2151	计算机组成原理实验 Computer Organization Experiments	16	0.5		16	4
	必修 Required	CST2281	数据库系统原理 Database System	48	3			4
	必修 Required	CST2291	数据库系统原理实践 Database System Experiments	32	1		32	4
	必修 Required	CST2032	操作系统原理 Operating System	48	3			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5		16	5
	必修 Required	CST2231	软件工程 Software Engineering	32	2			5
	必修 Required	CST2011	编译原理 Compiler Principles	48	3			6
	必修 Required	CST2021	编译原理实验 Compiler Principles Experiments	32	1		32	6
	必修 Required	CST2131	计算机系统结构 Computer Architecture	32	2			6
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5181	计算思维 Computational Thinking	32	2			1
	选修 Elective	CST5581	新生实践课 Computer Skills Practice for Freshman	32	1		32	1
	选修 Elective	CST5012	C++ 程序设计 Advanced Programming Language (C++)	40	2.5			3
	选修 Elective	CST5601	C++ 程序设计实验 Advanced Programming Language Experiment (C++)	24	0.75		24	3
	选修 Elective	CST0201	Python 大数据与人工智能实践 Python Big Data and Artificial Intelligence Practice	32	2		16	3
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	CST5491	大数据导论 Big Data Introduction	24	1.5			3
	选修 Elective	CST5211	命令式计算原理 Principles of imperative Computation	32	2			4



续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5021	JAVA 语言程序设计 Advanced Programming Language (JAVA)	40	2.5			4
	选修 Elective	CST5631	JAVA 语言程序设计实验 Advanced Programming Language Experiment (JAVA)	24	0.75		24	4
	选修 Elective	CST5041	Verilog 语言 Verilog language	32	1			4
	选修 Elective	CST5461	游戏设计与开发概论 Introduction to Game Design and Development	32	2			4
	选修 Elective	CST5611	大数据分析 Big Data Analysis	40	2.5			4
	选修 Elective	CST0071	大数据分析实验 Big Data Analysis Experiments	16	0.5		16	4
	选修 Elective	CST5144	机器学习 Machine Learning	40	2.5			4
	选修 Elective	CST0171	WEB 前端开发 (IT 生态课程) Web Front-end Development	32	2			5
	选修 Elective	CST0191	游戏设计与开发腾讯菁英课 (IT 生态课程) (Tencent Game Design and Development)	32	2			5
	选修 Elective	CST5511	大数据管理 Big Data Management	40	2.5			5
	选修 Elective	CST0101	大数据管理实验 Big Data Management Experiments	16	0.5		16	5
	选修 Elective	CST5522	计算机视觉 Computer Vision	32	2			5
	选修 Elective	CST5281	数值分析 Numerical Analysis	32	2			5
	选修 Elective	CST5171	计算理论 Computing Theory	32	2			5
	选修 Elective	CST5191	接口技术 Computer Interface Techniques	48	3			5
	选修 Elective	CST0021	网络空间安全概论 An Introduction to Cyberspace Security	32	2			5
	选修 Elective	CST5151	计算机图形学 Computer Graphics	32	2			5
	选修 Elective	CST5121	函数式编程原理 Principles of Functional Programming	32	2			5
	选修 Elective	CST0211	企业级工程设计与实践 (IT 生态课程) Enterprise Engineering Design and Practice	32	2			5
	选修 Elective	CST0221	可信软件开发 (IT 生态课程) Trusted Software Development	32	2			6
	选修 Elective	CST5551	自然语言处理 Natural Language Processing	40	2.5			6
	选修 Elective	CST0111	大数据处理系统 Big Data Processing System	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST0121	大数据处理系统实验 Big Data Processing System Experiments	16	0.5		16	6
	选修 Elective	CST5231	嵌入式系统 Embedded System	32	2		24	6
	选修 Elective	CST5461	云计算与虚拟化 Cloud Computing and Virtualization	32	2			6
	选修 Elective	CST0031	大数据存储与管理 Big Data Storage System and Management	32	2			6
	选修 Elective	CST5291	数字图像处理 Digital Image Processing	24	1.5			6
	选修 Elective	CST5051	并行编程原理与实践 Parallel Programming Principle and Practice	32	2			6
	选修 Elective	CST5381	信息存储技术 (IT 生态课程) Information Storage Techniques	24	1.5			7
	选修 Elective	CST5301	搜索引擎技术基础 Fundamentals of Search Engine	24	1.5			7
	选修 Elective	CST5431	移动客户端开发 (IT 生态课程) Mobile Client Development	24	1.5			7
	选修 Elective	CST5621	图神经网络导论 Introduction to Graph Neural Networks	32	2			7
	选修 Elective	CST5261	社会网络与计算 Social networking and Computing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练 (七) Engineering Practice Training (VII)	2w	1			4
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			3
	必修 Required	CST3661	硬件综合训练 Project of Hardware System	2w	1			5
	必修 Required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1			6
	选修 Elective	CST3681	科技创新活动 (一) Extracurricular Science and Technology Innovation (I)	4w	2			5
	选修 Elective	CST3691	科技创新活动 (二) Extracurricular Science and Technology Innovation (II)	4w	2			6
	选修 Elective	CST3701	科技创新活动 (三) Extracurricular Science and Technology Innovation (III)	4w	2			7
	必修 Required	CST3571	企业实训工程实践 Enterprise Project	15w	5			7
	必修 Required	CST3561	企业工程实践 II/毕业设计 (论文) Enterprise Project/Undergraduate Thesis	14w	7			8

说明：科技创新活动学分可以作为专业选修学分计算。

## 计算机科学与技术专业本硕博实验班培养计划（本科阶段）

### Undergraduate Program of Experimental Class for Computer Science and Technology

#### 一、培养目标

##### I . Program Objectives

本专业培养具有社会主义核心价值观、强烈社会责任感、适应社会经济和我国信息产业发展需求，数理基础、信息学科基础和计算机科学与技术专业理论扎实，创新精神与实践能力强，系统能力突出，具有家国情怀、世界胸怀、国际视野、追求学术理想、勇攀科学高峰，能适应我国信息产业自主可控发展战略的计算机领军人才。

Our major aims to cultivate leading talents on computer field with the core value of socialism and strong social responsibility and the ability to adapt the development needs of social economy and information industry of our country. We also teach the students to establish solid bases of mathematics, information subject and professional theory of computer science and technology, and they will be excellent on spirit of innovation, practical ability and computer system design ability. In the future, our students will chase their academic ideal and climb the peak of science with patriotism spirit, global mind and international vision and catch the step of autonomous-controlled development strategy of the information industry in our country.

#### 二、基本规格要求

##### II . Learning Outcomes

1. 工程知识：具备数学、自然科学、工程基础和计算机专业知识，并能用于解决计算机复杂工程问题；
2. 问题分析：能够应用数学、自然科学、工程科学以及计算机科学的基本原理，识别、表达、并通过文献研究分析计算机复杂工程问题，以获得有效结论；
3. 设计/开发解决方案：能设计针对计算机复杂工程问题的解决方案，设计满足特定需求的系统、模块或算法流程，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；
4. 研究：能基于计算机科学原理并采用科学方法对计算机复杂工程问题进行研究，通过实验设计、建模仿真、数据分析与解释、模型验证与改进方式，对计算机复杂工程问题进行研究并得到合理有效结论；
5. 使用现代工具：能够针对计算机复杂工程问题设计、预测、模拟与实现的需要，开发、选择与使用恰当的技术、软硬件及系统资源、现代化开发工具，并能够理解所使用工具和资源的局限性
6. 工程与社会：能够基于工程领域相关背景知识进行合理分析，评价计算机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，能理解并承担工程师的社会责任；
7. 环境和可持续发展：能理解和评价针对计算机领域复杂工程问题的专业工程实践对环境、社会可持续发展的影响；
8. 职业规范：具有良好的人文社会科学素养和社会责任感，能够在计算机工程实践中理解并

遵守工程职业道德和规范，履行工程师的责任；

9. 个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中协同工作，并承担个体、团队成员以及负责人的角色；

10. 沟通：能够就计算机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，熟悉计算机工程项目管理的基本方法和技术，并能在多学科环境中应用；

12. 终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应信息技术新发展的能力。

Students are expected to gain :

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong learning: Recognize the need for, and have the preparation and ability to engage in

independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

强数理基础、信息学科基础和计算机系统基础，以学术能力培养为中心，以创新能力培养为重点。培养模式上，促进科教融合，实行导师制、小班化、个性化、国际化。

We will intensify students' bases of mathematics, information subject and computer system. Our training will focus on academic ability training and innovative ability training. In the training mode, we will accelerate the integration of science and education Tutorial system, smaller classes, individuality and internationalization will also be put into the practice of our training process.

### 四、主干学科

#### IV. Main Discipline

计算机科学与技术 Computer Science & Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Program Length : 4 years

授予学位：工学学士

Degrees Conferred : Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：153.25 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 153.25 credits

完成学业最低课外学分要求：8

Minimum Extracurricular Credits : 8

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别	课程性质	学时/学分	学时/学分占比 (%)
素质教育通识课程	必修	588/30	19.5/19.6
	选修	160/10	5.3/6.5
学科大类基础课程	必修	760/43.75	25.2/28.5
专业核心课	必修	696/36.5	23/23.8
专业选修课	选修	288/18	9.5/11.7
集中性实践教学环节	必修	33w/15	17.5/9.9
实践教学合计	必修	344+33w/25.75	28.9/16.8
合计		3020/153.25	100/100

Course Classified	Course Nature	Hrs/Crs	Hrs/Crs Percentage (%)
Essential-qualities-oriented Education General Courses	Required	588/30	19.5/19.6
	Elective	160/10	5.3/6.5
Basic Courses in General Discipline	Required	760/43.75	25.2/28.5
Common Core Courses	Required	696/36.5	23/23.8
Specialty-Oriented Courses	Elective	288/18	9.5/11.7
Internship and Practical Training	Required	33w/15	17.5/9.9
Practical Teaching Total	Required	344+33w/25.75	28.9/16.8
Total		3020/153.25	100/100

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	6.7
工程训练	必修	2/1	6.7
课程设计及综合实践	必修	6/3	20
科研实践	必修	9/3	20
毕业设计 (论文)	必修	14/7	46.6
合计		33/15	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6.7
Electrical Engineering Practice	Required	2/1	6.7
Course Project and Comprehensive training	Required	6/3	20
Research Practice	Required	9/3	20
Undergraduate Thesis	Required	14/7	46.6
Total		33/15	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	社会实践	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩	2
3	劳动教育 (必修)	32 学时	2
4	计算机考试 (必修)	CCF 计算机软件能力认证 CSP 成绩 200~500 分	2~5
5	英语考试	CET6	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
6	学科竞赛	校级	获 1/2/3 等奖者
		省级	获 1/2/3 等奖者
		全国	获 1/2/3 等奖者
7	讲座	Time 系列讲座	参加 4 次以上
8	论文	在国际及全国性会议或期刊发表论文	每篇论文
9	科研	参与科研项目 (含大创项目)	每项

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同; 完成洛谷规定编程任务可认定 CSP 成绩 200 分。

No.	Extracurricular Activities and Social Practice	Requirements	Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense	2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province	2
2	Ideological and political course Social Practice (Required)	Submit a report and obtain a passing score	2

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
3	Labor Education (Required)	Public Service (32 hours)		2
4	Computer Examinations (Required)	Certified Software Professional 200-500		2~5
5	English Examinations	CET-6	PASS	2
		TOFEL	90 Points or Higher	4
		IELTS	6.5 Points or Higher	4
		GRE	1350 Points or Higher	4
6	Competitions	University Level	Win 1st/2nd/3rd prize	2/1/1
		Provincial Level	Win 1st/2nd/3rd prize	4/3/3
		National Level	Win 1st/2nd/3rd prize	6/5/5
7	Lectures	TIME Lecture series	A minimum of 4 times	2
8	Academic papers	International conference or national publications	Per piece	2~4
9	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	2~4

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 专业主干课 Main Courses in Specialty

C 语言程序设计 Advanced Programming Language (C)、离散数学 Discrete Mathematics、数据结构 Data Structure、算法设计与分析 Algorithmic Design & Analysis、并行数据结构及算法 Parallel a Data Structure and Algorithms、逻辑与计算机系统设计基础 Foundation of Logic and computer System Design、操作系统原理 Operating System、数据库系统原理 Database System、计算机通信与网络 Computer Telecommunications & Network、算法分析 Algorithmic Design & Analysis、编译原理 Compiler Principles。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

1. 创新(创业)意识启迪课程 Innovation (Entrepreneurship) Awareness Enlightenment Courses  
信息技术导论 (IT 中国) Introduction to Information Technology, 科学思维与训练方法 Scientific Thoughts and Research Methods
2. 创新(创业)能力培养课程 Innovation (Entrepreneurship) Ability Training Courses  
操作系统原理 Operating System、数据库系统原理 Database System、逻辑与计算机系统设计基础 Foundation of Logic and computer system Design
3. 创新(创业)实践培养课程 Innovation Practice Training Courses  
科研实践 Science Research Training、硬件综合训练 Project of Hardware System、操作系统课程设计 Course Project of Operating System。

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

工程训练 Engineering Training 、程序设计综合课程设计 Course Project of Programming、操作系统课程设计 Course Project of Operating System、硬件系统综合训练 Project of Hardware System、科研实践 Science Research Training、毕业设计（论文）Undergraduate Thesis

## 九、教学进程计划表

### IX. Course schedule

院（系）：计算机科学与技术学院

专业：计算机科学与技术

School (Department) : School of Computer Science & Technology

Major: Computer Science & Technology

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			4-6
	必修 Required	CH0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
			从不同公选模块中选修不低于 10 学分的课程（其中美育类不低于 2 学分，经济与管理类不少于 2 学分，思维与方法类不少于 1 学分，《大学生心理健康》必修） General Education Courses (elective)	160	10			2-8
学科大类基础课程 Basic Courses in General Discipline	必修 Required	CST0721	信息技术导论（IT 中国） Introduction to Information Technology	24	1.5			1
	必修 Required	CST0731	科学思维与训练方法 Scientific Thoughts and Research Methods	16	1			1
	必修 Required	CST0511	C 语言程序设计 Advanced Programming Language ( C )	48	3			1



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础课程 Basic Courses in General Discipline	必修 Required	CST0521	C 语言程序设计实验 Advanced Programming Language Experiments	32	1		32	1
	必修 Required	MAT0552	微积分 (A) 上 Calculus ( I )	96	6			1
	必修 Required	MAT0722	线性代数 (A) Linear Algebra ( I )	48	3			1
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1	32		2
	必修 Required	MAT0532	微积分 (A) 下 Calculus ( I )	96	6			2
	必修 Required	MAT0592	概率论与数理统计 (A) Probability Theory and Mathematical Statistic (A)	48	3			2
	必修 Required	PHY0521	大学物理 (二) Physics ( II )	64	4			3
	必修 Required	PHY0561	物理实验 (二) Physical Experiments ( II )	24	0.75	24		3
	必修 Required	EEE0641	电路理论 (三) Circuit Theory ( III )	64	4			3
	必修 Required	CST0741	信息论基础 Elementary Information Theory	32	2			4
	必修 Required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			5
	必修 Required	CST0551	计算机通信与网络实验 Computer Telecommunications & Network Experiments	32	1		32	5
专业核心课程 Specialty Required Courses	必修 Required	CST2171	离散数学 (一) Discrete Mathematics ( I )	48	2.5			2
	必修 Required	CST2261	数据结构 Data Structure	48	3			2
	必修 Required	CST2272	数据结构实验 Data Structure Experiments	32	1		32	2
	必修 Required	CST2161	离散数学 (二) Discrete Mathematics ( II )	48	2.5			3
	必修 Required	CST2261	算法设计与分析 Algorithmic Design & Analysis	32	2			3
	必修 Required	CST2421	算法设计与分析实践 Algorithmic Design & Analysis	24	0.75		24	3
	必修 Required	CST5161	计算机系统基础 Foundation of Computer System	40	2.5			3
	必修 Required	CST0041	计算机系统基础实验 Foundation of Computer System	32	1		32	3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	CST2281	数据库系统原理 Database System	48	3			4
	必修 Required	CST2291	数据库系统原理实践 Database System Experiments	32	1		32	4
	必修 Required	CST0051	逻辑与计算机设计 Logic and Computer System Design	64	4			4
	必修 Required	CST0061	逻辑与计算机设计实践 Experiments of Logic and Computer Design	32	1		32	4
	必修 Required	CST2072	并行数据结构与算法 Parallel Data Structure and Algorithms	32	2			5
	必修 Required	CST2071	并行数据结构与算法实验 Parallel Data Structure and Algorithms Experiments	24	0.75		24	5
	必修 Required	CST2032	操作系统原理 Operating System	48	3			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5		16	5
	必修 Required	CST2011	编译原理 Compiler Principles	48	3			6
	必修 Required	CST2021	编译原理实验 Compiler Principles Experiments	32	1		32	6
	必修 Required	CST2131	计算机系统结构 Computer Architecture	32	2			6
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5181	计算思维 Computational Thinking	32	2			1
	选修 Elective	CST5581	新生实践课 Computer Skills Practice for Freshman	32	1		32	1
	选修 Elective	CST5012	C++ 程序设计 Advanced Programming Language (C++)	40	2.5			3
	选修 Elective	CST5601	C++ 程序设计实验 Advanced Programming Language Experiment (C++)	24	0.75		24	3
	选修 Elective	CST0201	Python 大数据与人工智能实践 Python Big Data and Artificial Intelligence Practice	32	2		16	3
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	CST5491	大数据导论 Big Data Introduction	24	1.5			3
	选修 Elective	CST5211	命令式计算原理 Principles of Imperative Computation	32	2			4
	选修 Elective	CST5021	JAVA 语言程序设计 Advanced Programming Language (JAVA)	40	2.5			4
	选修 Elective	CST5631	JAVA 语言程序设计实验 Advanced Programming Language Experiment (JAVA)	24	0.75		24	4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5041	Verilog 语言 Verilog Language	32	1			4
	选修 Elective	CST5461	游戏设计与开发概论 Introduction to Game Design and Development	32	2			4
	选修 Elective	CST5611	大数据分析 Big Data Analysis	40	2.5			4
	选修 Elective	CST0071	大数据分析实验 Big Data Analysis Experiments	16	0.5		16	4
	选修 Elective	CST5144	机器学习 Machine Learning	40	2.5			4
	选修 Elective	CST0171	WEB 前端开发 (IT 生态课程) Web Front-end Development	32	2			5
	选修 Elective	CST0191	游戏设计与开发腾讯菁英课 (IT 生态课程) (Tencent Game Design and Development)	32	2			5
	选修 Elective	CST5511	大数据管理 Big Data Management	40	2.5			5
	选修 Elective	CST0101	大数据管理实验 Big Data Management Experiments	16	0.5		16	5
	选修 Elective	CST5522	计算机视觉 Computer Vision	32	2			5
	选修 Elective	CST5281	数值分析 Numerical Analysis	32	2			5
	选修 Elective	CST5171	计算理论 Computing Theory	32	2			5
	选修 Elective	CST5191	接口技术 Computer Interface Techniques	48	3			5
	选修 Elective	CST0021	网络空间安全概论 An Introduction to Cyberspace Security	32	2			5
	选修 Elective	CST5151	计算机图形学 Computer Graphics	32	2			5
	选修 Elective	CST5121	函数式编程原理 Principles of Functional Programming	32	2			5
	选修 Elective	CST0211	企业级工程设计与实践 (IT 生态课程) Enterprise Engineering Design and Practice	32	2			5
	选修 Elective	CST0221	可信软件开发 (IT 生态课程) Trusted Software Development	32	2			6
	选修 Elective	CST5551	自然语言处理 Natural Language Processing	40	2.5			6
	选修 Elective	CST0111	大数据处理系统 Big Data Processing System	40	2.5			6
	选修 Elective	CST0121	大数据处理系统实验 Big Data Processing System Experiments	16	0.5		16	6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	CST5231	嵌入式系统 Embedded System	32	2		24	6
	选修 Elective	CST5461	云计算与虚拟化 Cloud Computing and Virtualization	32	2			6
	选修 Elective	CST0031	大数据存储与管理 Big Data Storage System and Management	32	2			6
	选修 Elective	CST5291	数字图像处理 Digital Image Processing	24	1.5			6
	选修 Elective	CST5051	并行编程原理与实践 Parallel Programming Principle and Practice	32	2			6
	选修 Elective	CST5381	信息存储技术 (IT 生态课程) Information Storage Techniques	24	1.5			7
	选修 Elective	CST5301	搜索引擎技术基础 Fundamentals of Search Engine	24	1.5			7
	选修 Elective	CST5431	移动客户端开发 (IT 生态课程) Mobile Client Development	24	1.5			7
	选修 Elective	CST5621	图神经网络导论 Introduction to Graph Neural Networks	32	2			7
	选修 Elective	CST5261	社会网络与计算 Social networking and Computing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练 (七) Engineering Practice Training (VII)	2w	1			4
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			3
	必修 Required	CST3661	硬件综合训练 Project of Hardware System	2w	1			5
	必修 Required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1			6
	必修 Required	CST3542	科研实践 Science Research Training	9w	3			3-6
	选修 Elective	CST3681	科技创新活动 (一) Extracurricular Science and Technology Innovation (I)	4w	2			5
	选修 Elective	CST3691	科技创新活动 (二) Extracurricular Science and Technology Innovation (II)	4w	2			6
	选修 Elective	CST3701	科技创新活动 (三) Extracurricular Science and Technology Innovation (III)	4w	2			7
	必修 Required	CST3511	毕业设计 (论文) (硕士阶段研究环节) Undergraduate Thesis	14w	7			8

说明：选修课可直接选研究生阶段相关课程；科技创新活动学分可以作为专业选修学分计算。

华中科技大学 2022 级本科专业培养计划

附件：研究生阶段（硕士及博士阶段）

课程	类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	公共必修课程	408110001	自然辩证法概论	18	1	春/秋	马克思主义学院	必修≥ 9 学分
		408130001	新时代中国特色社会主义思想理论与实践	36	2	春/秋	马克思主义学院	
		411130003	第一外国语（英语）	32	2	秋/春	外国语学院	
		408210001	中国马克思主义与当代	36	2	秋	马克思主义学院	
		411210001	英语论文写作	32	2	秋	外国语学院	
	一级学科基础课	011110001	矩阵论	48	3	秋	数学与统计学院	必修≥ 9 学分 (矩阵论、 随机过程 必须 二选一)
		011110005	随机过程	48	3	秋	数学与统计学院	
		210131002	高级计算机系统结构	32	2	秋	计算机学院	
		210131027	高级分布式系统	32	2	秋	计算机学院	
		210131003	现代计算机网络	32	2	秋	计算机学院	
		210131006	多媒体基础	32	2	秋	计算机学院	
		210131035	高级算法设计与分析	32	2	秋	计算机学院	
		210111020	机器学习	32	2	秋	计算机学院	
		210131024	IT 中国（信息前沿导论）	16	1	秋	计算机学院	
		210131021	学术规范与论文写作	16	1	春	计算机学院	
	二级学科基础课	210131007	信息存储理论与技术	32	2	秋	计算机学院	限定选修 ≥ 4 学分
		210131015	并行程序设计	32	2	秋	计算机学院	
		210131029	数据科学与工程导论	32	2	秋	计算机学院	
		210131030	数据挖掘	32	2	秋	计算机学院	
		210131033	数字图像处理	32	2	秋	计算机学院	
		210131026	可计算与计算复杂性理论	32	2	秋	计算机学院	
		210131040	强化学习	32	2	秋	计算机学院	
	硕士专业选修课程	210111001	计算机系统分析与性能评价	32	2	秋	计算机学院	任选≥ 4 学分
		210111002	计算机系统导论	32	2	秋	计算机学院	
		210131025	分布式存储系统设计与实践	32	2	秋	计算机学院	
		210131020	区块链技术与应用	32	2	春	计算机学院	
		210131028	普适计算与边缘计算	32	2	秋	计算机学院	
		210111016	知识工程与知识图谱	32	2	秋	计算机学院	
		210121005	大数据处理与 MapReduce 编程模型实践	32	2	秋	计算机学院	
		210131031	智能媒体计算	32	2	秋	计算机学院	
		210131032	数字信号处理	32	2	秋	计算机学院	
		210131022	计算机视觉	32	2	秋	计算机学院	
		210131034	医学图像处理实践	32	2	秋	计算机学院	
		210131023	人工智能	32	2	秋	计算机学院	
		210111019	神经网络导论	32	2	秋	计算机学院	
		210131036	认知计算导论与应用	32	2	春	计算机学院	
		210131037	自然语言处理	32	2	春	计算机学院	
		210131010	面向对象方法学	32	2	秋	计算机学院	
		210131038	软件过程与项目管理	32	2	秋	计算机学院	
		210131039	数据安全和隐私保护	32	2	秋	计算机学院	
		210111007	信息隐藏	32	2	秋	计算机学院	

续表

课程	类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	博士专修课程	210211003	计算机系统结构专题	32	2	春	计算机学院	≥4 学分
		210231002	信息存储系统专题	16	1	春	计算机学院	
		210231011	高级操作系统专题	32	2	春	计算机学院	
		210231001	求解 NP 难度问题的现代方法	32	2	秋	计算机学院	
		210231013	时空数据管理高级论题	32	2	秋	计算机学院	
		210231014	数据挖掘高级论题	32	2	秋	计算机学院	
		210231009	人工智能高级论题	32	2	春	计算机学院	
		210231016	机器学习高级论题	32	2	春	计算机学院	
		210231015	高级图像处理专题	16	1	秋	计算机学院	
		210231012	云计算高级专题	32	2	春	计算机学院	
		210231010	大数据前沿讲座	16	1	春	计算机学院	
	跨一级学科课程	跨一级学科研究生课程			2	春/秋	除计算机学院外的其他院系	任选 ≥ 4 学分
非学位课	补修课程	如有需要，可在导师指导下补修本科阶段课程、任选课程只计成绩，不计学分						
研究环节		650239001	开题报告（博）		1		计算机学院	
		650239003	参加国内外学术会议并提交论文（博）		1			
		650239002	论文中期进展报告（博）		1			
		650239004	发表学术论文（博）		1			
		650219001	博士学位论文（学术型）		15			

## 光学与电子信息学院

光学与电子信息学院拥有 4 个本科专业（光电信息科学与工程、电子科学与技术、集成电路设计与集成系统、微电子科学与工程），7 个硕士点（微电子学与固体电子学、半导体芯片系统设计与工艺、材料物理与化学、电子信息材料与元器件、光学工程、物理电子学、光电信息工程），8 个博士点（微电子学与固体电子学、电子科学与技术、材料物理与化学、半导体芯片系统设计与工艺、电子信息材料与元器件、光学工程、物理电子学、光电信息工程）以及 2 个一级学科博士后流动站（电子科学与技术、光学工程）。构筑了包括本科、硕士、博士、博士后教育在内的完整人才培养体系。

拥有两个国家级重点学科，一级学科“光学工程”和二级学科“微电子学与固体电子学”，其中一级学科“光学工程”先后在 2012 年和 2017 年的学科评估中并列全国第一，是国家“双一流建设学科”。学院依托武汉光电国家研究中心、激光加工国家工程研究中心、下一代互联网接入系统国家工程实验室等国家级平台，推进人才培养科教协同创新模式。学院还积极发挥电子信息功能材料教育部重点实验室、教育部敏感陶瓷工程研究中心、武汉市集成电路设计工程技术研究中心、武汉智慧城市研究院等省部级科研平台的育人作用。

拥有一流的教育教学资源。2003 年，成为教育部和科技部两部委联合授予的第一批 9 个“国家集成电路人才培养基地”之一；2007 年获批教育部“面向群体创新人才互动式培养实验区”；2011 年经教育部批准，设立了“教育教学改革特别试验区”，成为了全国 17 所国家试点学院之一；2015 年，获批建设武汉国际微电子学院，筹建国家示范性微电子学院；2018 年，获评国家级教学成果一等奖；2019 年，获评全国教育系统先进集体；2021 年，获批建设“国家集成电路产教融合创新平台”；四个本科专业“光电信息科学与工程”、“集成电路设计与集成系统”、“电子科学与技术”和“微电子科学与工程”先后入选国家“双万”计划，同为“国家级一流本科专业建设点”。

学院借鉴国际一流大学的办学经验，贯彻“基于课程、面向群体、强化数理、突出实践、项目驱动、协同育人”的教育理念，融合产业学科优势，实施面向全体本科生的创新教育，培养具有国际竞争力的应用科学家和卓越工程师。

## 电子科学与技术专业本科培养计划

### Undergraduate Program for Specialty in Electronic Science and Technology

#### 一、培养目标

##### I . Program Objectives

本专业培养德、智、体、美、劳全面发展，基础理论扎实、知识面宽、实践能力强、综合素质高、适应 21 世纪电子科学技术发展需要，在信息的获取、传输、处理、存贮，以及信息显示等专业领域中的一个或两个方向具有特色，能在相关领域内从事研究、设计、开发和管理等方面工作的高级人才。

This program trains advanced talents with all-round development of morality, intelligence, physique, aesthetics and labour, and with solid theoretical basis, wide knowledge horizon, good practice ability and high comprehensive quality. These talents can meet the demands of the development of electronic science and technology in the 21st century, have characteristics in one or two academic fields of the information obtaining, transmission, processing, storage and display, and can be engaged in various vocations, such as scientific research, engineering design, development and management.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有较扎实的自然科学基本理论基础和宽阔的科学视野；
2. 对全球信息科学和技术的前沿、发展动态及其影响具有足够的理解力和敏感性；
3. 具备较强的分析问题和解决问题的综合能力；
4. 具备先进电子材料、光子材料、电子和光电子器件、大规模集成电路、集成电子系统和光电子系统以及计算机辅助设计和测试技术等方面的理论基础和实验技能；
5. 具有较强的外语和计算机应用能力；
6. 掌握文献检索、资料查询的方法和撰写科学论文的能力；
7. 具有良好的人文素质、有效的交际能力以及较强的协调、组织能力；
8. 具有较强的创新精神和竞争意识；
9. 具有较强的在未来生活和学习中继续学习的能力。

The knowledge and abilities our graduates should have are listed as follows:

1. Have solid fundamental theoretical knowledge in natural science and wide scientific horizon;
2. Have enough apprehension and sensitivity to the new developments and the impacts of the global information science and technology ;
3. Have good comprehensive ability to analysis and solve problems ;
4. Have theoretical basis and experimental skills in the fields of advanced electronic materials, photon materials, electronic and opto-electronic devices, large-scale integrated circuit, integrated electronic system and opto-electronic system, and computer-aided design and testing ;
5. Have good ability to use foreign language and computer ;
6. Master the method of literature retrieving and data-inquiring, and be able to write scientific articles ;



7. Be of good quality in humanities, effective ability in social intercourse and good ability in coordinating and organizing ;

8. Have strong consciousness of creativity and competition ;

9. Have good ability to continuous studying in future life and work.

### 三、培养特色

#### III. Program Highlights

以材料为基础，电子和光电子器件的设计和制造为核心，以系统应用为方向。坚持理工结合，重视基础理论，强调宽口径培养，着眼全面提高学生的综合素质。注重教学和科研的协调发展，促进教学内容随着科技发展不断更新。

Based on material research, focusing on the design and fabrication of electronic and opto-electronic devices, and oriented at system application, our program Converging science and engineering, strengthening fundamental knowledge, and multi-disciplinary education system, improve the overall performance of the students. Furthermore, we also highly value a balanced development of teaching and scientific research, and pay much attention to the update of teaching content with the development of science and technology.

### 四、主干学科

#### IV. Main Disciplines

电子科学与技术

Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.75 学分

Minimum Credits of Curricular(Comprising course system and intensified internship practical training) : 162.75credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program.

完成学业最低课外学分要求：5 学分。

Minimum Extracurricular Credits : 5 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：三选一的专业方向选修模块（8.5 学分）及其对应的课程设计（1.0 学分）；专业任选课程（不低于 15.5 学分），其中在本专业范围内完成专业任选课程累积不低于 5.5 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented module (8.5 credits) chosen one out of three and their corresponding

Course Project (1.0 credits); Specialty-oriented courses (not less than 15.5 credits), of which, the elective courses offered by Specialty, accumulated no less than 5.5 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	588/30	18.4
		选修	160/10	6.1
学科基础课程		必修	1048/60.75	37.4
专业课程	专业核心课程	必修	424/25	15.4
	专业选修课程	选修	384/24	14.7
集中性实践教学环节		必修	28w/12	7.4
		选修	2w/1	0.6
合计			2604+30w/162.75	100
其中，总实验（实践）学时及占比			748	25.0

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	588/30	18.4
		Elective	160/10	6.1
Discipline-related Courses		Required	1048/60.75	37.4
Specialty Courses	Specialty Core Courses	Required	424/25	15.4
	Specialty Elective Courses	Elective	384/24	14.7
Practical Training		Required	28w/12	7.4
		Elective	2w/1	0.6
Total			2604+30w/162.75	100
Practicum Credits			748	25.0

### 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	7.7
生产实习	必修	3W/1.5	11.5
课程设计	必修	4W/2	15.4
课程设计(四选一)	选修	2W/1	7.7
工程训练	必修	2W/1	7.7
专业认知实验	必修	1W/0.5	3.8
毕业设计(论文)	必修	16W/6	46.2
合计		30W/13	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	7.7
Engineering Internship	Required	3W/1.5	11.5
Course Project	Required	4W/2	15.4
Course Project (Four choose one)	Elective	2W/1	7.7
Engineering Training	Required	2W/1	7.7
Experiments for Specialty Cognition	Required	1W/0.5	3.8
Undergraduate Thesis	Required	16W/6	46.2
Total		30W/13	100

## 3. 课外学分

## Extracurricular Credits

序号	名 称	要 求	课外学分
1	思政课社会实践（必修）	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育（必修）	32 学时	2
4	英语及计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	论文	在全国性及国际期刊或会议发表论文	每篇论文
7	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements	Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score	2
2	Community Engagement	Submitting a report and passing the oral defense	2
		Individuals awarded "Active Participant" / Teams awarded "Excellent Performance" by HUST or Hubei Youth League Committee	2
3	Labor education	Practical Service	Pass
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher
		National Computer Rank Examination	Certificate (Grade 1 / 2)
		Qualifications for Computer and Software Technology Proficiency	Programmer
			Senior Programmer
			System Analyst
5	Competitions	University Level	First Prize
			Second Prize
			Third Prize
		Provincial Level	First Prize
			Second Prize
			Third Prize
		National Level	First Prize
			Second Prize
			Third Prize

continue

No.	Activities	Requirements		Extracurricular Credits
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper	2-3
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution	1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主干课程 Main Courses in Specialty

固体物理 Solid State Physics、半导体物理 Semiconductor Physics、电磁场与电磁波 Electromagnetic Field and Wave、量子力学 Quantum Mechanics、电子材料物理 Physics of Electronic Material、电子器件工艺原理 Process Principle of Electronic Device、计算材料学与材料设计基础 Computational Material Science and Fundamental of Material Design、电子器件基础 Fundamentals of Electronic devices、半导体器件物理 Physics of Semiconductor Devices

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

光电信息技术导论 Introduction to Photonics and Electronics Technology、专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course :

电子材料物理 Physics of Electronic Material、电子器件基础 Fundamentals of Electronic devices、电子器件工艺原理 Process Principle of Electronic Device、计算材料学与材料设计 Computational Material Science and Fundamental of Material Design

创新实践训练课程 Innovative Practice Training Course :

必修 Required :

电子器件制备工艺创新实践 Innovation Practice for Fabrication Process of Electronic Device、工程训练（七）Engineering Training (VII)

选修（四选一）Choose One Out of Four :

集成电路课程设计 Course Project for IC Design、计算材料学课程设计 Course Project for Computational Material Science、能源光电子器件制备工艺课程设计 Course Project for Fabrication Process of Energy Photoelectron Device、微波器件与微波电路设计课程设计 Course Project for microwave devices and microwave circuit design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

专业认知实验 Experiments for Specialty Cognition、电子科学与技术专业基础实验 Specialized Fundamental Experiments of Electronic Science and Technology、软件课程设计 Course Project for Software Design、电子器件制备工艺创新实践 Innovation Practice for Fabrication Process of Electronic Device、工程训练（七）Engineering Training (VII)、集成电路课程设计 Course Project for IC Design、计算材料学课程设计 Course Project for Computational Material Science、能源光电子器件制备工艺课程设计 Course Project for Fabrication Process of Energy Photoelectron Device、微波器件与微波电路设计课程设计 Course Project for microwave devices and microwave circuit design、科研创新实践 Scientific Research and Innovation Practice、专业实习 Engineering Internship、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

## IX. Course Schedule

院(系): 光学与电子信息学院

专业: 电子科学与技术

School (Department): School of Optical and Electronic Information

Major: Electronic Science and Technology

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语(一) Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语(二) Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育(一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育(二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育(三) Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程, 美育类课程、大学生心理健康课程均不低于 2 学分, 总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分(一)上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分(一)下 Calculus ( II )	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related Courses	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments ( II )	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	OEI0621	光电信息技术导论 Introduction to Photonics and Electronics Technology	24	1.5			1、5、7
	必修 Required	EEE0721	电路理论 (五) Circuit Theory ( V )	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0591	模拟电子技术 (二) Analogue Electronics ( II )	56	3.5			3
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学 (二) Quantum Mechanics ( II )	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics Statistical Physics	32	2			4
专业核心课程 Specialty Core Courses	必修 Required	OEI2111	固体物理 Solid State Physics	48	3			5
	必修 Required	OEI2041	半导体物理 (一) Semiconductor Physics ( I )	48	3			5
	必修 Required	OEI2051	电磁场与电磁波 Electromagnetic Field and Wave	48	3			5
	必修 Required	OEI2071	电子材料物理 Physics of Electronic Materials	48	3			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Core Courses	必修 Required	OEI2021	半导体器件物理 Physics of Semiconductor Devices	40	2.5			6
	必修 Required	OEI2311	现代化学基础（二） Fundamental of Modern Chemistry（II）	32	2			6
	必修 Required	OEI2211	计算材料科学与材料设计 Computational Materials Science and Fundamental of Materials Design	32	2			6
	必修 Required	OEI2101	电子器件基础 Fundamentals of Electronic Devices	40	2.5			6
	必修 Required	OEI2091	电子器件工艺原理 Process Principle of Electronic Device	40	2.5			6
	必修 Required	OEI2081	电子科学与技术专业基础实验 Specialized Fundamental Experiments of Electronic Science and Technology	48	1.5	48		6
			专业方向选修模块（三选一） Specialty-oriented Module (choose one out of three)					
专业选修课程 Specialty-oriented Courses			A.微电子学与固体电子学课程模块 A. Microelectronics and Solid State Electronics Module					
	选修 Elective	OEI5121	电子显微分析 Electron Microscopy and Analysis	32	2	4		5
	选修 Elective	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			6
	选修 Elective	OEI5101	电子材料与器件测试技术 Measurement Techniques for Electronic Material and Device	32	2			6
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensors	32	2			6
			B.微波技术与微波电路课程模块 B. Microwave Technology and Microwave Circuit Module					
	选修 Elective	OEI5291	射频/微波技术基础 Basis of RF/Microwave Technique	32	2			5
	选修 Elective	OEI5091	电磁兼容技术 Electromagnetic Compatibility Technology	32	2			5
	选修 Elective	OEI5281	微波器件原理与设计 The Principle and Design of Microwave Device	32	2			6
	选修 Elective	OEI5791	射频集成电路基础 Fundamentals of Radio Frequency IC	40	2.5			6
			C. 光电子材料与器件课程模块 C. Photoelectron Materials and Devices Module					
	选修 Elective	OEI5161	高等化学 Advanced Chemistry	40	2.5			5
	选修 Elective	OEI0051	光电子学与光子学 Optoelectronics and Photonics	32	2			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5541	太阳能电池 Basic Principles of Solar Cell	32	2			6
	选修 Elective	OEI5501	能源存储与器件 Energy Storage Devices	32	2			6
			专业任选课 Elective Courses in Specialty					1-7
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2251	数字集成电路基础（二） Fundamentals of Digital Integrated Circuit ( II )	40	2.5			6
	选修 Elective	OEI5301	硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System	32	2			5
	选修 Elective	OEI5741	光电信息功能材料 Optoelectronic Information Functional Materials	32	2			6
	选修 Elective	OEI5751	纳米能源技术概论 Introduction to Nano Energy Technology	32	2			5
	选修 Elective	OEI2231	嵌入式系统原理与设计 Principles and Design of Embedded System	40	2.5			5
	选修 Elective	OEI5711	自旋电子学器件 Spintronics Devices	32	2			7
	选修 Elective	OEI5111	电子封装与表面组装技术 Electronic Packaging and Surface Assembling	32	2			7
	选修 Elective	OEI5691	压电换能器与海洋声呐技术 Piezoelectric Transducer and Marine Sonar Technology	24	1.5			7
	选修 Elective	OEI5241	天线原理与雷达技术 Principle of Antenna and Radar Technology	32	2			7
	选修 Elective	OEI5271	量子信息学导论 Introduction of Quantum Informatics	32	2			7
	选修 Elective	OEI5591	微波有源电路设计 Theory Analysis and Design of Microwave Active Circuit	32	2			7
	选修 Elective	OEI5581	微波器件测量 Microwave Device Measurement	32	2			7
	选修 Elective	OEI5231	微波磁学 Microwave Magnetism	32	2			7
	选修 Elective	OEI5131	电子信息对抗 Electronic Information Countermeasure	24	1.5			7
	选修 Elective	OEI5061	半导体激光器 Semiconductor Laser	32	2			7
	选修 Elective	OEI5321	光电探测器 Photoelectric Detection Devices	32	2			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting and Display Technology	32	2			7



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5771	磁性材料与器件 Magnetic Material and Device	32	2			7
	选修 Elective	OEI5491	纳米材料与器件 Nano Materials and Devices	32	2			7
实践环节 Practical Training Items			从 4 门课程设计（选修）中任选一门，与相应课程模块匹配 One course project is selected from 4 elective course projects to match the corresponding course module					
	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2w	1			4
	必修 Required	OEI3711	生产实习 Engineering Internship	3W	1.5			6
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1W	0.5			1
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2w	1			1
	必修 Required	OEI3801	电子器件制备工艺创新实践 Innovation Practice for Fabrication Process of Electronic Device	2w	1			6
	选修 Elective	OEI3631	集成电路课程设计 Course Project for Integrated Circuit Design	2w	1			6
	选修 Elective	OEI3641	计算材料学课程设计 Course Project for Computational Material Science	2w	1			6
	选修 Elective	OEI3681	能源光电子器件制备工艺课程设计 Course Project for Fabrication Process of Energy Photoelectron Device	2w	1			6
	选修 Elective	OEI3731	微波器件与微波电路设计课程设计 Course Project for Microwave Devices and Microwave Circuit Design	2w	1			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16w	6			7-8

## 电子科学与技术专业辅修培养计划

### Undergraduate Program for Auxiliary Specialty in Electronic Science and Technology

#### 一、培养目标

##### I. Educational Objectives

本专业培养德、智、体、美、劳全面发展，基础理论扎实、知识面宽、实践能力强、综合素质高、适应 21 世纪电子科学技术发展需要，在信息的获取、传输、处理、存贮，以及信息显示等专业领域中的一个或两个方向具有特色，能在相关领域内从事研究、设计、开发和管理等方面工作的高级人才。

This program trains advanced talents with all-round development of morality, intelligence and physique, and with solid theoretical basis, wide knowledge horizon, good practice ability and high comprehensive quality. These talents can meet the demands of the development of electronic science and technology, have characteristics in one or two academic fields of the information obtaining, transmission, processing, storage and display, and can be engaged in various vocations, such as scientific research, engineering design, development and management.

#### 二、学分

##### II. Credits

完成学业最低学分要求：25

Minimum Course Credits : 25

其中：

Including：

学科基础课程：13 学分

Basic Courses in Discipline : 13

学科专业课程：12 学分

Courses in Specialty : 12

#### 三、教学进程计划表

##### III. Table of Teaching Schedule

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in Discipline 学科基础课程	必修 Required	EIC0591	模拟电子技术（二） Analogue Electronics (II)	56	3.5			3
	必修 Required	OEI2111	固体物理 Solid State Physic	48	3			5
	必修 Required	OEI2041	半导体物理（一） Semiconductor Physics ( I )	48	3			5
	必修 Required	OEI2021	半导体器件物理 Physics of Semiconductor Devices	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科专业课程 Courses in Specialty			专业选修课程 Electives in Specialty	192/12				
			以下 5 门课程至少选 1 门 At Least One out of Five					
	选修 Elective	OEI2101	电子器件基础 Fundamentals of Electronic Devices	40	2.5			6
	选修 Elective	OEI2091	电子器件工艺原理 Process Principle of Electronic Device	40	2.5			6
	选修 Elective	OEI2071	电子材料物理 Physics of Electronic Material	48	3			5
	选修 Elective	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			6
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensors	32	2			6
			以下 16 门课程至少选 3 门，其它可在信息学院课程中任选 At Least Three out of 16, Others Can Be Selected from Any Courses Offered by Information School					
	选修 Elective	OEI5101	电子材料与器件测试技术 Measurement Techniques for Electronic Material and Device	32	2			6
	选修 Elective	OEI5281	微波器件原理与设计 The Principle and Design of Microwave Device	32	2			6
	选修 Elective	OEI5541	太阳能电池 Basic Principles of Solar Cell	32	2			6
	选修 Elective	OEI5501	能源存储与器件 Energy Storage Devices	32	2			6
	选修 Elective	OEI2231	嵌入式系统原理与设计 Principles and Design of Embedded System	40	2.5			5
	选修 Elective	OEI5711	自旋电子学器件 Spintronics Device	32	2			7
	选修 Elective	OEI5111	电子封装与表面组装技术 Electronic Packaging and Surface Assembling	32	2			7
	选修 Elective	OEI5691	压电换能器与海洋声呐技术 Piezoelectric Transducer and Marine Sonar Technology	24	1.5			7
	选修 Elective	OEI5241	天线原理与雷达技术 Principle of Antenna and Radar Technology	32	2			7
	选修 Elective	OEI5091	电磁兼容技术 EMC Technology	32	2			7
	选修 Elective	OEI5231	微波磁学 Microwave Magnetism	32	2			7
	选修 Elective	OEI5131	电子信息对抗 Electronic Information Countermeasure	24	1.5			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科专业课程 Courses in Specialty	选修 Elective	OEI5061	半导体激光器 Semiconductor Laser	32	2			7
	选修 Elective	OEI5321	光电探测器 Photoelectric Detection Devices	32	2			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting and Display Technology	32	2			7

## 集成电路设计与集成系统本科培养计划

### Undergraduate Program for Specialty in IC Design and Integrated System

#### 一、培养目标

##### I . Program Objectives

德、智、体、美、劳全面发展，以半导体器件为基础，以超大规模集成电路设计及集成电路制造工艺为核心，以人工智能算法及系统、处理器体系架构研究、嵌入式系统开发与应用为方向，培养能在集成电路及智能系统领域从事研究、设计、开发和管理的高级人才。

Cultivate moral, intellectual, physical, aesthetic, labor and all-round development. Based on semiconductor devices, with VLSI design and integrated circuit manufacturing process as the core, artificial intelligence algorithms and systems, processor architecture research, embedded system development and application as the direction, training in integrated circuits and intelligent systems Senior talents in research, design, development and management.

#### 二、基本规格要求

##### II . Learning Outcomes

要求学生具有良好素质、道德修养和创新能力，具备扎实的数学、物理、外语基础，掌握大规模集成电路及集成系统所必需的基本理论和方法，具有超大规模集成电路分析及设计、版图设计和系统集成等的基本能力。具体而言，毕业生应获得以下几个方面的知识和能力：

1. 具有较扎实的自然科学基本理论基础和宽阔的科学视野；
2. 对全球信息科学和技术的前沿、发展动态及其影响具有足够的理解力和敏感性；
3. 具备较强的分析问题和解决问题的综合能力；
4. 具有较强的外语和计算机应用能力；
5. 掌握文献检索、资料查询的方法和撰写科学论文的能力；
6. 具有良好的人文素质、有效的交际能力以及较强的协调、组织能力；
7. 具有较强的创新精神和竞争意识；
8. 具有较强的在未来生活和工作中继续学习的能力。

The program requires that the learners, with good quality, moral cultivation and innovation capability, be equipped with solid mathematics, physics and English, bases fundamental theories and methods essential to VLSI, basic capabilities of VLSI analysis and design, layout design and system integration. Specifically speaking, our graduates are expected to have the knowledge and abilities listed as follows:

1. Have solid fundamental theoretical knowledge in natural science and wide scientific horizon;
2. Have enough apprehension and sensitivity to the new developments and the impacts of the global information science and technology;
3. Have good comprehensive ability to analysis and solve problems;
4. Have good ability to use foreign language and computer;
5. Master the method of literature retrieving and data-inquiring, and the ability to write scientific articles;

6. Be of good quality in humanities, effective ability in social intercourse and good ability in coordinating and organizing;

7. Have strong consciousness of creativity and competition;

8. Have good ability to continuous studying in future life and work.

### 三、培养特色

#### III. Program Highlights

本专业融合电子工程与计算机科学，形成从信息系统体系结构出发到嵌入式系统以及片上系统硬件实现的“Top-to-Down”的专业人才培养体系。课程设置上，覆盖半导体器件与集成电路设计，以及体系结构与嵌入式系统。提供系列化的综合型和研究型课程设计，以及学科交叉、特色鲜明的任选课程组合。坚持理工结合，重视基础理论，强调宽口径培养，着眼全面提高学生的综合素质。

This specialty converges electronic engineering and computer science, setting up a “Top-to-Down” talent training system from system architecture to hardware implementation respectively via embedded system and system on chip. Two professional directions are divided for course system into semiconductor device and IC design, as well as computer architecture and embedded system. Comprehensive course projects, as well as featured and cross-disciplinary optional course combination are available in curriculum. Converging science and engineering, strengthening fundamental knowledge, and multi-disciplinary education system, improve the overall performance of the students.

### 四、主干学科

#### IV. Main Discipline

电子科学与技术

Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：161.75 学分。

Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 161.75 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：5 学分。

Minimum Extracurricular Credits : 5 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：在本专业范围内完成专业任选课程累积不低于 15 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented courses offered by Specialty, accumulated no less than 15 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	588/30	18.5
	选修	160/10	6.2
学科基础课程	必修	1048/60.75	37.5
专业课程	专业核心课程	360/21	13.0
	专业选修课程	400/25	15.5
集中性实践教学环节	必修	34w/15	9.3
合计		2556+34w/161.75	100
其中，总实验（实践）学时及占比		812	26.2

Course Type	Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses	Required	588/30	18.5
	Elective	160/10	6.2
Discipline-related Courses	Required	1048/60.75	37.5
Specialty Courses	Specialty Core Courses	360/21	13.0
	Specialty Elective Courses	400/25	15.5
Practical Training	Required	34w/15	9.3
Total		2556+34w/161.75	100
Practicum Credits		812	26.2

### 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	6.7
专业认知实验	必修	1W/0.5	3.3
生产实习	必修	3W/1.5	10.0
工程训练	必修	2W/1	6.7
课程设计	必修	10W/5	33.3
毕业设计（论文）	必修	16W/6	40.0
合计		34W/15	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	6.7
Experiments for Specialty Cognition	Required	1W/0.5	3.3
Engineering Internship	Required	3W/1.5	10.0
Engineering Training	Required	2W/1	6.7
Course Project	Required	10W/5	33.3
Undergraduate Thesis	Required	16W/6	40.0
Total		34W/15	100

### 3. 课外学分

Extracurricular Credits

华中科技大学 2022 级本科专业培养计划

序号	名 称	要 求	课外学分
1	思政课社会实践（必修）	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育（必修）	32 学时	2
4	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	论文	在全国性及国际期刊或会议发表论文	每篇论文
7	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements	Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score	2
2	Community Engagement	Submitting a report and passing the oral defense	2
		Individuals awarded "Active Participant" / Teams awarded "Excellent Performance" by HUST or Hubei Youth League Committee	2
3	Labor education	Practical Service	Pass
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher
		National Computer Rank Examination	Certificate (Grade 1 / 2)
		Qualifications for Computer and Software Technology Proficiency	Programmer
			Senior Programmer
			System Analyst
5	Competitions	University Level	First Prize
			Second Prize
			Third Prize
		Provincial Level	First Prize
			Second Prize
			Third Prize
		National Level	First Prize
			Second Prize
			Third Prize
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.



## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主干课程 Main Courses in Specialty

计算机组成原理 Principles of Computer Organization、处理器体系结构 Processor Architecture、信号与线性系统 Signal and Linear System、嵌入式系统原理与设计 Principles and Design of Embedded System、硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System、微电子工艺学 Microelectronic Process、数字集成电路基础（一） Fundamentals of Digital Integrated Circuit (I)、CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit、高级模拟集成电路设计 Advanced Analog Integrated Circuit Design、半导体器件物理 Physics of Semiconductor Devices.

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

光电信息技术导论 Introduction to Photonics and Electronics Technology、专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course :

高级模拟集成电路设计 Advanced Analog Integrated Circuit Design、数字集成电路基础（一） Fundamentals of Digital Integrated Circuit (I)、计算机组成原理 Principles of Computer Organization

创新实践训练课程 Innovative Practice Training Course :

全国大学生集成电路创新创业大赛（生产实习期间，全员参与）China College IC innovation and Entrepreneurship Competition (Full Participation during Engineering Internship)、嵌入式系统创新实践 Innovation Practice for Embedded system

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

专业认知实验 Experiments for Specialty Cognition、工程训练 Engineering Training、集成电路设计与集成系统专业实验 Specialized Experiments of IC Design and Integrated System、软件课程设计 Course Project for Software Design、数字集成电路课程设计 Course Project for Digital IC、模拟集成电路课程设计 Course Project for Analog IC、微电子工艺课程设计 Course Project for Microelectronic Fabrication、嵌入式系统创新实践 Innovation Practice for Embedded system、科研创新实践 Scientific Research and Innovation Practice、专业实习 Engineering Internship、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

### IX. Course Schedule

院（系）：光学与电子信息学院

专业：集成电路设计与集成系统

School (Department): School of Optical and Electronic Information

Major: Integrated Circuit Design and Integrated System

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质 教育 通识 课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分（一）下 Calculus ( II )	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1	32		2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	PHY0561	物理实验（二） Physical Experiments (II)	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	OEI0621	光电信息技术导论 Introduction to Photonics and Electronics Technology	24	1.5			1、5、7
	必修 Required	EEE0721	电路理论（五） Circuit Theory (V)	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics Statistical Physics	32	2			4
专业核心课程 Specialty Core Courses	必修 Required	OEI2031	半导体物理（二） Semiconductor Physics (II)	40	2.5			5
	必修 Required	OEI2021	半导体器件物理 Physics of Semiconductor Devices	40	2.5			5
	必修 Required	OEI2241	数字集成电路基础（一） Fundamentals of Digital Integrated Circuit (I)	56	3.5			5
	必修 Required	OEI2201	集成电路专业基础实验 Specialized Fundamental Experiments Of IC	48	1.5	48		5
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			5
	必修 Required	OEI2221	计算机组成原理 Principles of Computer Organization	56	3.5			5
	必修 Required	OEI2231	嵌入式系统原理与设计 Principles and Design of Embedded System	40	2.5			6
	必修 Required	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Principle of Modern Chemistry ( II )	32	2			3
	选修 Elective	OEI5801	人工智能导论 Introduction to Artificial Intelligence	32	2			3
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			5
	选修 Elective	OEI5071	处理器体系结构 Processor Architecture	40	2.5			6
	选修 Elective	OEI5301	硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System	32	2			5
	选修 Elective	OEI5721	类脑计算与器件 Brain-inspired Computing and Devices	32	2			5
	选修 Elective	OEI5791	射频集成电路基础 Fundamentals of Radio Frequency IC	40	2.5			6
	选修 Elective	OEI5761	高级模拟集成电路设计 Advanced Analog Integrated Circuit Design	40	2.5			6
	选修 Elective	OEI5021	MEMS 系统与应用 MEMS System and Application	32	2			6
	选修 Elective	OEI5531	数字信号处理 Digital Signal Processing	32	2			6
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensors	32	2			6
	选修 Elective	OEI5811	智能计算系统 AI Computing System	32	2			6
	选修 Elective	OEI5311	微电子器件可靠性技术基础 Fundamental of Microelectronics Device Reliability Technology	32	2			6
	选修 Elective	OEI5551	通信原理（二） Principles of Communication ( II )	32	2			6
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5781	集成电路科学与工程前沿技术概论 Frontier Introduction to IC Science and Engineering	24	1.5			7
	选修 Elective	OEI5351	光电子器件导论 Introduction to Optoelectronic Device	32	2			7
	选修 Elective	OEI5401	化合物半导体器件 Compound Semiconductor Devices	32	2			7
	选修 Elective	OEI5191	功率集成电路 Power Integrated Circuits	32	2			7
	选修 Elective	OEI5271	量子信息学导论 Introduction of Quantum Informatics	32	2			7
	选修 Elective	OEI5451	集成电路封装与系统测试 Package and System Test for IC	32	2			7
	选修 Elective	OEI5671	信息存储技术基础 Fundamental of Information Storage Technology	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2W	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1W	0.5			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2W	1			4
	必修 Required	OEI3711	生产实习 Engineering Internship	3W	1.5			6
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2W	1			1
	必修 Required	OEI3721	数字集成电路课程设计 Course Project for Digital IC Design	2W	1			5
	必修 Required	OEI3671	模拟集成电路课程设计 Course Project for Analog IC Design	2W	1			6
	必修 Required	OEI3741	微电子工艺课程设计 Course Project for Microelectronic Fabrication	2W	1			6
	必修 Required	OEI3831	嵌入式系统创新实践 Innovation Practice for Embedded System	2w	1			7
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16W	6			7-8

## 集成电路设计与集成系统辅修专业培养计划

### Undergraduate Program for Auxiliary Specialty in IC Design and Integrated System

#### 一、培养目标

##### I . Program Objectives

以半导体器件为基础，以超大规模集成电路设计及集成电路制造工艺为核心，以人工智能算法及系统、处理器体系架构研究、嵌入式系统开发与应用为方向，培养能在集成电路及智能系统领域从事研究、设计、开发和管理的高级人才。

Based on semiconductor devices, with VLSI design and integrated circuit manufacturing process as the core, artificial intelligence algorithms and systems, processor architecture research, embedded system development and application as the direction, training in integrated circuits and intelligent systems Senior talents in research, design, development and management.

#### 二、学时与学分

##### II . Credits Hours and Units

完成学业最低课内学分要求：25 学分。

Minimum Credits of Curricular : 25 credits

其中：

Including：

学科基础课程：13 学分

Basic Courses in Discipline : 13

学科专业课程：12 学分

Courses in Specialty : 12

#### 三、教学进程计划表

##### III . Course Schedule

院（系）：光学与电子信息学院

专业：集成电路设计与集成系统

School (Department): School of Optical and Electronic Information

Major: Integrated Circuit Design and Integrated System

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in Discipline 学科基础课程	必修 Required	EIC0591	模拟电子技术（二） Analogue Electronics (II)	56	3.5			3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5			3
	必修 Required	OEI2031	半导体器件物理 Physics of Semiconductor Device	40	2.5			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科专业课程 Courses in Specialty			以下 5 门课程至少选 2 门					
	选修 Elective	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			5
	选修 Elective	OEI2241	数字集成电路基础（一） Fundamentals of Digital Integrated Circuit ( I )	56	3.5			5
	选修 Elective	OEI2221	计算机组成原理 Principles of Computer Organization	56	3.5			5
	选修 Elective	OEI5531	数字信号处理 Digital Signal Processing	32	2			6
	选修 Elective	OEI5791	射频集成电路基础 Fundamentals of Radio Frequency IC	40	2.5			6
			以下 10 门课程至少选 3 门，其它可在光电信息学院课程中任选					
	选修 Elective	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6
	选修 Elective	OEI5301	硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System	32	2			5
	选修 Elective	OEI5021	MEMS 系统与应用 MEMS System and Application	32	2			6
	选修 Elective	OEI2231	嵌入式系统原理与设计 Principles and Design of Embedded System	40	2.5			6
	选修 Elective	OEI5071	处理器体系结构 Processor Architecture	40	2.5			6
	选修 Elective	OEI5761	高级模拟集成电路设计 Advanced Analog Integrated Circuit Design	40	2.5			6
	选修 Elective	OEI5551	通信原理（二） Principles of Communication ( II )	32	2			6
	选修 Elective	OEI5451	集成电路封装与系统测试 Package and System Test for IC	32	2			7
	选修 Elective	OEI5191	功率集成电路 Power Integrated Circuits	32	2			7
	选修 Elective	OEI3721	数字集成电路课程设计 Course Project for Digital IC Design	2W	1			5

## 光电信息科学与工程专业本科培养计划

### Undergraduate Program for Specialty In Optoelectronic Information Science and Engineering

#### 一、培养目标

##### I . Program Objectives

培养德、智、体、美、劳全面发展，具有系统扎实的光电理论基础，在信息的获取、传递、处理及应用等方面具有较宽广的专业知识，英语应用能力和工程实践动手能力强，人文素质和创新精神优秀，并在激光科学与工程、光纤通信系统与技术、光电系统与信息处理、光电子集成器件技术等方向具有一定专长的高素质人才。毕业生能在研究院所、高等院校、信息产业部门及其相关领域从事信息科学与技术的研究、系统集成与设计、开发等方面的工作。

Cultivate moral, intellectual, physical, aesthetic, labor and all-round development, with a systematic, solid theoretical basis for optoelectronics, in the acquisition, transmission, processing and application of information has a broad professional knowledge, English application ability and engineering practice hands-on ability, humanistic quality and innovative spirit excellent, and in laser science and engineering, fiber optic communication systems and technology, optoelectronic systems and information processing, optoelectronic integrated device technology and other directions have a certain expertise in high-quality personnel. Graduates can work in research, system integration and design, development of information science and technology in research institutes, institutions of higher learning, information industry departments and related fields.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 扎实的数理基础；
2. 掌握光学与光电子学、电子与信息科学的基本理论和方法；
3. 解决本学科领域内的科研及工程问题的能力；
4. 了解本学科发展的前沿动态；
5. 较强的英语语言能力；
6. 优秀的文献检索、资料查询与综述，以及科技论文和研究报告撰写的能力；
7. 良好的人文社科知识和人文素质，以及较强的协调、组织能力；
8. 较强的创新精神。

As students of this program, you will gain:

1. Solid grounding in maths and physics;
2. Basic theories and methods of Optics, Optoelectronics, Electronics and Information Science;
3. The competency in solving the problems in specialty of scientific research and engineering;
4. Knowledge of the development of the discipline;
5. Mastery of English;
6. Basic methods of literature survey, reviewing and scientific thesis writing ability;
7. Solid grounding in humanities and arts and ability of managing and organizing;



8. Innovative thinking.

### 三、培养特色

#### III. Program Highlights

注重科学基础，坚持理工交叉，突出专业特色，发展学生个性。不断将学科优势转化为优质教学资源，为本科生科学实践提供强有力支持，提高本科生创新能力。

Paying attention to science foundation, sticking to the intersection of science and technology, highlighting the characteristics of major, and developing students' personality. We will continue to transform the discipline advantages into high-quality teaching resources, provide strong support for the scientific practice of undergraduates, and improve the innovation ability of undergraduates.

### 四、主干学科

#### IV. Main Discipline

光学工程

Optical Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：160.25 学分。

Minimum Credits of Curricular(Comprising course system and intensified internship practical training) : 160.25credits

其中，专业基础课程、专业核心课程学分不允许用其它课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：5 学分。

Minimum Extracurricular Credits : 5 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：四选一的专业方向选修模块（8.5 学分）及其对应的课程设计（1.0 学分）；专业任选课程（不低于 15.5 学分），其中在本专业范围内完成专业任选课程累积不低于 5.5 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented module (8.5 credits) chosen one out of four and their corresponding Course Project (1.0 credits); Specialty-oriented courses (not less than 15.5 credits), of which, the elective courses offered by Specialty, accumulated no less than 5.5 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

#### 1. 课程体系学时与学分

Course Credits Hours and Units

华中科技大学 2022 级本科专业培养计划

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	588/30	18.7
		选修	160/10	6.3
学科基础课程		必修	1048/60.75	37.9
专业课程	专业核心课程	必修	400/22.5	14.0
	专业选修课程	选修	384/24	15.0
集中性实践教学环节		必修	28w/12	7.5
		选修	2w/1	0.6
合计			2580+30w/160.25	100
其中，总实验（实践）学时学及占比			780	25.5

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	588/30	18.7
		Elective	160/10	6.3
Discipline-related Courses		Required	1048/60.75	37.9
Specialty Courses	Specialty Core Courses	Required	400/22.5	14.0
	Specialty Oriented Courses	Elective	384/24	15.0
Practical Training		Required	28w/12	7.5
		Elective	2w/1	0.6
Total			2580+30w/160.25	100
Practicum Credits			780	25.5

2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	7.7
专业认知实验	必修	1W/0.5	3.8
软件课程设计	必修	2W/1	7.7
光学课程设计	必修	2W/1	7.7
工程训练	必修	2W/1	7.7
生产实习	必修	3W/1.5	11.5
专业方向课程设计	选修	2W/1	7.7
毕业设计（论文）	必修	16W/6	46.2
合计		30W/13	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	7.7
Experiments for Specialty Cognition	Required	1W/0.5	3.8
Software Programming Course Project	Required	2W/1	7.7
Optical Design Course Project	Required	2W/1	7.7
Engineering Training	Required	2W/1	7.7
Engineering Internship	Required	3W/1.5	11.5
Specialty-oriented Course Project	Elective	2W/1	7.7
Undergraduate Thesis	Required	16W/6	46.2
Total		30W/13	100

2. 课外学分

Extracurricular Credits

华中科技大学 2022 级本科专业培养计划

序号	名 称	要 求	课外学分
1	思政课社会实践（必修）	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育（必修）	32 学时	2
4	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	论文	在全国性及国际期刊或会议发表论文	每篇论文
7	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements	Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score	2
2	Community Engagement	Submitting a report and passing the oral defense	2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee	2
3	Labor education	Practical Service	Pass
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher
		National Computer Rank Examination	Certificate (Grade 1 / 2)
		Qualifications for Computer and Software Technology Proficiency	Programmer
			Senior Programmer
			System Analyst
5	Competitions	University Level	First Prize
			Second Prize
			Third Prize
		Provincial Level	First Prize
			Second Prize
			Third Prize
		National Level	First Prize
			Second Prize
			Third Prize
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主干课程 Main Courses in Specialty

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、光电探测与信号处理 Optoelectronic Detection & Signal Processing、光纤光学 Fiber Optics、光纤通信技术 Optical Fiber Communication Technology、单片机原理及应用 Principle and Application of Single Chip Microcomputer、信号与线性系统 Signals and Linear Systems、电动力学 Electrodynamics、量子力学 Quantum Mechanics、热力学与统计物理 Thermodynamics and Statistical Physics

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

光电信息技术导论 Introduction to Photonics and Electronics Technology、专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course :

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology

创新实践训练课程 Innovative Practice Training Course :

工程训练（七）Engineering Training (VII)

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

课程设计 Course Project : 软件课程设计 Course Project for Software Design、光学课程设计 Course Project for Optical Design、专业方向课程设计 Course Project in Specialty Tracks

集中实践教学环节 Intensified Internship and Practical Training: 专业认知实验 Experiments for Specialty Cognition、科研创新实践 Scientific Research and Innovation Practice、生产实习 Engineering Internship、毕业设计 Undergraduate Thesis

专业实验 Specialized Experiments : 应用光学实验 Applied Optics Experiments、物理光学实验 Physical Optics Experiments、激光实验 Lasers Experiments、光纤光学实验 Fiber Optics Experiments、光电技术实验 Optoelectronic Technology Experiments

## 九、教学进程计划表

### IX. Course Schedule

院（系）：光学与电子信息学院

专业：光电信息科学与工程

School (Department): School of Optical and Electronic Information Major: Optoelectronic Information Science and Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分（一）下 Calculus ( II )	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments ( II )	24	0.75	24		3
	必修 Required	OEI0621	光电信息技术导论 Introduction to Photonics and Electronics Technology	24	1.5			1、5、7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EEE0721	电路理论（五） Circuit Theory（V）	64	4			2
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics（II）	56	3.5			3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics（II）	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics Statistical Physics	32	2			4
专业核心课程 Specialty Core Courses	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2331	应用光学实验 Applied Optics Experiments	16	0.5	16		5
	必修 Required	OEI2061	电动力学 Electrodynamics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2301	物理光学实验 Physical Optics Experiments	16	0.5	16		5
	必修 Required	OEI2161	光电探测与信号处理 Optoelectronic Detection and Signal Processing	48	3			5
	必修 Required	OEI2121	光电技术实验 Optoelectronic Technology Experiments	16	0.5	16		5
	必修 Required	OEI2151	激光原理与技术 Laser Principles and Technologies	64	4			6
	必修 Required	OEI2191	激光实验 Lasers Experiments	16	0.5	16		6
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2181	光纤光学实验 Fiber Optics Experiments	16	0.5	16		6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			专业方向选修模块（四选一） Specialty-oriented Module (Choose One out of Four)					
			A. 激光科学与工程专业方向课程 A: Laser Science & Engineering					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5431	激光器件与系统 Laser Devices and Systems	40	2.5			6
			B. 光电子器件与集成专业方向课程 B: Optoelectronic Devices and Integration					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			6
			C. 光通信与光网络技术专业方向课程 C: Optical Communication & Optical Network Technology					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
			D. 光电系统与信息处理专业方向课程 D: Optoelectronic System & Information Processing					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5341	光电仪器学 Optoelectronic Instrumentation	40	2.5			6
			专业任选课 Elective Courses in Specialty					1-7
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Principle of Modern Chemistry ( II )	32	2			3
	选修 Elective	OEI5611	微电子器件与 IC 设计（二） Microelectronic Device and IC Design ( II )	40	2.5			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5731	超快激光微纳制造原理与技术 Principle of Ultrafast Laser Micro-nano Manufacturing and Technology	32	2			6
	选修 Elective	OEI5331	光电图像处理 Optoelectronic Image Processing	40	2.5			7
	选修 Elective	OEI5511	生物医学光学原理与成像技术 Biomedical Optics: Principles and Imaging	32	2			7
	选修 Elective	OEI5441	激光与物质相互作用 Laser-Matter Interaction	32	2			7
	选修 Elective	OEI5631	微纳光电系统 Micro and Nano Optoelectronic System	40	2.5			7
	选修 Elective	OEI5421	激光光谱 Laser Spectroscopy	40	2.5			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting & Display Technology	32	2			7
	选修 Elective	OEI5031	半导体薄膜材料 Semiconductor Thin Film Materials	40	2.5			7
	选修 Elective	OEI5221	光互联与光交换网络技术 Technology for Optical Interconnection & Optical Switching Network	32	2			7
	选修 Elective	OEI5521	生物医学光子学基础 Fundamentals of Biophotonics	32	2			7
	选修 Elective	OEI5471	精密机械设计与 CAD Precision Mechanical Design & CAD	40	2.5			7
	选修 Elective	OEI5661	现代光学实验 Modern Optical Experiment	24	1	24		7
	选修 Elective	OEI5371	光纤传感及网络技术 Fiber Sensing and Network Technology	32	2			7
	选修 Elective	OEI5211	现代材料分析技术 Modern Analytical Techniques for Materials	32	2			7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2W	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1W	0.5			1
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2W	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2W	1			4
	必修 Required	OEI3611	光学课程设计 Optical Design Course Project	2W	1			5
	必修 Required	OEI3711	生产实习 Engineering Internship	3W	1.5			6
	选修 Elective	OEI3621	激光科学与工程专业方向课程设计 Course Project in Laser Science & Engineering	2W	1			6



续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	选修 Elective	OEI3591	光电子器件与集成专业方向课程设计 Course Project in Optoelectronic Devices and Integration	2W	1			6
	选修 Elective	OEI3601	光通信与光网络技术专业方向课程设计 Course Project in Optical Communication & Optical Network Technology	2W	1			6
	选修 Elective	OEI3571	光电系统与信息处理专业方向课程设计 Course Project in Optoelectronic System & Information Processing	2W	1			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16W	6			7-8

## 光电信息科学与工程专业辅修培养计划

### Undergraduate Program for Auxiliary Specialty in Optoelectronic Information Science and Engineering

#### 一、培养目标

##### I . Educational Objectives

培养德、智、体、美、劳全面发展，具有光电信息、光纤通信领域里系统、扎实的理论基础，知识结构合理，具有创新能力和国际竞争力的高素质的科技人才。

This program prepares students with basic and systematic knowledge of optoelectronic information Optical Fiber Communication, and enables its graduates with capability of innovation and quality to compete internationally.

#### 二、学分

##### II . Credits

完成学业最低学分要求：25

Minimum Course Credits : 25

其中：

Including：

学科基础课程：14 学分

Basic Courses in Discipline: 14

学科专业课程：11 学分

Courses in Specialty: 11

## 三、教学进程计划表

## III. Table of Teaching Schedule

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in Discipline 学科基础课程	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2151	激光原理与技术 Laser Theory and Technology	64	4			6
学科专业课程 Courses in Specialty	选修 Elective	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	选修 Elective	OEI2161	光电探测与信号处理 Optoelectronic Detect & Signal Processing	48	3			5
	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5431	激光器件与系统 Laser Devices and Systems	40	2.5			6
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			6
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
	选修 Elective	OEI5331	光电图像处理 Optoelectronic Image Processing	40	2.5			7

## 光电信息科学与工程本科专业培养计划（中法班）

### Undergraduate Program for Specialty in Optoelectronic Information Science and Engineering for Sino-France Class

#### 一、培养目标

##### I . Program Objectives

培养德、智、体、美、劳全面发展，具有系统、扎实的光电理论基础，在信息的获取、传递、处理及应用等方面具有较宽广的专业知识，英语应用能力和工程实践动手能力强，人文素质和创新精神优秀，并在激光科学与工程、光纤通信系统与技术、光电系统与信息处理、光电子集成器件技术等方向具有一定专长的高素质人才。毕业生能在研究院所、高等院校、信息产业部门及其相关领域从事信息科学与技术的研究、系统集成与设计、开发等方面的工作。

Cultivate moral, intellectual, physical, aesthetic, labor and all-round development, with a systematic, solid theoretical basis for optoelectronics, in the acquisition, transmission, processing and application of information has a broad professional knowledge, English application ability and engineering practice hands-on ability, humanistic quality and innovative spirit excellent, and in laser science and engineering, fiber optic communication systems and technology, optoelectronic systems and information processing, optoelectronic integrated device technology and other directions have a certain expertise in high-quality personnel. Graduates can work in research, system integration and design, development of information science and technology in research institutes, institutions of higher learning, information industry departments and related fields.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 扎实的数理基础；
2. 掌握光学与光电子学、电子与信息科学的基本理论和方法；
3. 解决本学科领域内的科研及工程问题的能力；
4. 了解本学科发展的前沿动态；
5. 较强的法语语言能力；
6. 优秀的文献检索、资料查询与综述，以及科技论文和研究报告撰写的能力；
7. 较好的人文社科知识和人文素质，以及较强的协调、组织能力；
8. 较强的创新精神。

As students of this program, you will gain:

1. Solid grounding in maths and physics;
2. Basic theories and methods of Optics, Optoelectronics, Electronics and Information Science;
3. The competency in solving the problems in specialty of scientific research and engineering;
4. Knowledge of the development of the discipline;
5. Mastery of France;
6. Basic methods of literature survey, reviewing and scientific thesis writing ability;
7. Solid grounding in humanities and arts and ability of managing and organizing;

8. Innovative thinking.

### 三、培养特色

#### III. Program Highlights

注重科学基础，坚持理工交叉，突出专业特色，发展学生个性。不断将学科优势转化为优质教学资源，为本科生科学实践提供强有力支持，提高本科生创新能力。

Paying attention to science foundation, sticking to the intersection of science and technology, highlighting the characteristics of major, and developing students' personality. We will continue to transform the discipline advantages into high-quality teaching resources, provide strong support for the scientific practice of undergraduates, and improve the innovation ability of undergraduates.

### 四、主干学科

#### IV. Main Discipline

光学工程

Optical Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：165.25 学分。

Minimum Credits of Curricular(Comprising course system and intensified internship practical training) : 165.25 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：12.5 学分。

Minimum Extracurricular Credits : 12.5 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：四选一的专业方向选修模块（8.5 学分）及其对应的课程设计（1.0 学分）；专业任选课程（不低于 15.5 学分），其中在本专业范围内完成专业任选课程累积不低于 5.5 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented module (8.5 credits) chosen one out of four and their corresponding Course Project (1.0 credits); Specialty-oriented courses (not less than 15.5 credits), of which, the elective courses offered by Specialty, accumulated no less than 5.5 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

#### 1. 课程体系学时与学分

Course Credits Hours and Units

华中科技大学 2022 级本科专业培养计划

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	700/37	22.3
		选修	160/10	6.1
学科基础课程		必修	1024/59.25	35.9
专业课程	专业核心课程	必修	400/22.5	13.6
	专业选修课程	选修	384/24	14.5
集中性实践教学环节		必修	27w/11.5	7.0
		选修	2w/1	0.6
合计			2668+29w/165.25	100
其中, 总实验(实践)学时及占比			764	25.0

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Basic Courses in General Education		Required	700/37	22.3
		Elective	160/10	6.1
Subject Fundamentals		Required	1024/59.25	35.9
Specialty Courses	Specialty-required Courses	Required	400/22.5	13.6
	Technical Electives	Elective	384/24	14.5
Practical Training		Required	27w/11.5	7.0
		Elective	2w/1	0.6
Total			2668+29w/165.25	100
Practicum Credits			764	25.0

2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	8.0
软件课程设计	必修	2W/1	8.0
光学课程设计	必修	2W/1	8.0
工程训练	必修	2W/1	8.0
生产实习	必修	3W/1.5	12.0
专业方向课程设计	选修	2W/1	8.0
毕业设计(论文)	必修	16W/6	48.0
合计		29W/12.5	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	8.0
Software Programming Course Project	Required	2W/1	8.0
Optical Design Course Project	Required	2W/1	8.0
Engineering Training	Required	2W/1	8.0
Engineering Internship	Required	3W/1.5	12.0
Specialty-oriented Course Project	Elective	2W/1	8.0
Undergraduate Thesis	Required	16W/6	48.0
Total		29W/12.5	100

3. 课外学分

Extracurricular Credits

华中科技大学 2022 级本科专业培养计划

序号	名 称	要 求	课外学分
1	思政课社会实践（必修）	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育（必修）	32 学时	2
4	大学法语实践	必修，第一学年和第二学年分别开设四周	7.5
5	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
6	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
7	论文	在全国性及国际期刊或会议发表论文	每篇论文
8	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements	Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score	2
2	Community Engagement	Submitting a report and passing the oral defense	2
		Individuals awarded "Active Participant" / Teams awarded "Excellent Performance" by HUST or Hubei Youth League Committee	2
3	Labor education	Practical Service	Pass
4	France Practice	four weeks in the first and second year	Pass
5	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher
		National Computer Rank Examination	Certificate (Grade 1 / 2)
		Qualifications for Computer and Software Technology Proficiency	Programmer
			Senior Programmer
			System Analyst
6	Competitions	University Level	First Prize
			Second Prize
			Third Prize
		Provincial Level	First Prize
			Second Prize
			Third Prize
		National Level	First Prize
			Second Prize
			Third Prize
7	Academic Papers	Publication of papers in national or international journals or conference	Each paper
8	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主干课程 Main Courses in Specialty

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、光电探测与信号处理 Optoelectronic Detection & Signal Processing、光纤光学 Fiber Optics、光纤通信技术 Optical Fiber Communication Technology、单片机原理及应用 Principle and Application of Single Chip Microcomputer、信号与线性系统 Signals and Linear Systems、电动力学 Electrodynamics、量子力学 Quantum Mechanics、热力学与统计物理 Thermodynamics and Statistical Physics

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course :

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology

创新实践训练课程 Innovative Practice Training Course :

工程训练（七）Engineering Training (VII)

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

课程设计 Course Project : 软件课程设计 Course Project for Software Design、光学课程设计 Course Project for Optical Design、专业方向课程设计 Course Project in Specialty Tracks

集中实践教学环节 Intensified Internship and Practical Training: 专业认知实验 Experiments for Specialty Cognition、生产实习 Engineering Internship、科研创新实践 Scientific Research and Innovation Practice、毕业设计 Undergraduate Thesis

专业实验 Specialized Experiments : 应用光学实验 Applied Optics Experiments、物理光学实验 Physical Optics Experiments、激光实验 Lasers Experiments、光纤光学实验 Fiber Optics Experiments、光电技术实验 Optoelectronic Technology Experiments

## 九、教学进程计划表

### IX. Course Schedule

院（系）：光学与电子信息学院

专业：光电信息科学与工程

School (Department): School of Optical and Electronic Information Major: Optoelectronic Information Science and Engineering

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
General Education Core Curriculum	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 General Education Core Curriculum	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	OEI0001	大学法语（一） France (I)	64	4			2
	必修 Required	OEI0011	大学法语（三） France (III)	64	4			3
	必修 Required	OEI0021	大学法语（四） France (IV)	64	4			4
	必修 Required	OEI0031	大学法语（六） France (VI)	32	2			5
	必修 Required	PHE0002	大学体育（一） Physical Education (I)	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education (II)	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education (III)	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0551	微积分（一）上 Calculus (I)	88	5.5			1
	必修 Required	MAT0531	微积分（一）下 Calculus (II)	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics (I)	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics (II)	64	4			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments (II)	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EEE0721	电路理论（五） Circuit Theory (V)	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4
专业核心课程 Specialty Required Courses	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2331	应用光学实验 Applied Optics Experiments	16	0.5	16		5
	必修 Required	OEI2061	电动力学 Electrodynamics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2301	物理光学实验 Physical Optics Experiments	16	0.5	16		5
	必修 Required	OEI2161	光电探测与信号处理 Optoelectronic Detection and Signal Processing	48	3			5
	必修 Required	OEI2121	光电技术实验 Optoelectronic Technology Experiments	16	0.5	16		5
	必修 Required	OEI2151	激光原理与技术 Laser Theory and Technology	64	4			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	OEI2191	激光实验 Lasers Experiments	16	0.5	16		6
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2181	光纤光学实验 Fiber Optics Experiments	16	0.5	16		6
专业选修课程 Specialty-oriented Courses			专业方向选修模块（四选一） Specialty-oriented Module (Choose One out of Four)					
			A. 激光科学与工程专业方向课程 A: Laser Science & Engineering					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5431	激光器件与系统 Laser Devices and Systems	40	2.5			6
			B. 光电子器件与集成专业方向课程 B: Optoelectronic Devices and Integration					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			6
			C. 光通信与光网络技术专业方向课程 C: Optical Communication & Optical Network Technology					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
			D. 光电系统与信息处理专业方向课程 D: Optoelectronic System & Information Processing					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5341	光电仪器学 Optoelectronic Instrumentation	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			专业任选课 Elective Courses in Specialty					1-7
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Fundamental of Modern Chemistry (II)	32	2			3
	选修 Elective	OEI5611	微电子器件与 IC 设计（二） Microelectronic Device and IC Design ( II )	40	2.5			5
	选修 Elective	OEI5731	超快激光微纳制造原理与技术 Principle of Ultrafast Laser Micro-nano Manufacturing and Technology	32	2			6
	选修 Elective	OEI5331	光电图像处理 Optoelectronic Image Processing	40	2.5			7
	选修 Elective	OEI5511	生物医学光学原理与成像技术 Biomedical Optics: Principles and Imaging	32	2			7
	选修 Elective	OEI5441	激光与物质相互作用 Laser- Matter Interaction	32	2			7
	选修 Elective	OEI5631	微纳光电系统 Micro and Nano Optoelectronic System	40	2.5			7
	选修 Elective	OEI5421	激光光谱 Laser Spectrum	40	2.5			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting & Display Technology	32	2			7
	选修 Elective	OEI5031	半导体薄膜材料 Semiconductor Thin Films Materials	40	2.5			7
	选修 Elective	OEI5221	光互连与光交换网络技术 Technology for Optical Interconnection & Optical Switching Network	32	2			7
	选修 Elective	OEI5521	生物医学光子学基础 Fundamentals of Biophotonics	32	2			7
	选修 Elective	OEI5471	精密机械设计与 CAD Fine Mechanics Design & CAD	40	2.5			7
	选修 Elective	OEI5661	现代光学实验 Modern Optical Experiment	24	1	24		7
	选修 Elective	OEI5371	光纤传感及网络技术 Fiber sensing and Network Technology	32	2			7
	选修 Elective	OEI5211	现代材料分析技术 Modern Analytical Technologies for Materials	32	2			7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2W	1			1
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2W	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2W	1			4
	必修 Required	OEI3611	光学课程设计 Course Project Optical Design	2W	1			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	选修 Elective	OEI3621	激光科学与工程专业方向课程设计 Course Project in Laser Science & Engineering	2W	1			6
	选修 Elective	OEI3591	光电子器件与集成专业方向课程设计 Course Project in Optoelectronic Devices and Integration	2W	1			6
	选修 Elective	OEI3601	光通信与光网络技术专业方向课程设计 Course Project in Optical Communication & Optical Network Technology	2W	1			6
	选修 Elective	OEI3571	光电系统与信息处理专业方向课程设计 Course Project in Optoelectronic System & Information Processing	2W	1			6
	必修 Required	OEI3711	生产实习 Engineering Internship	3W	1.5			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16W	6			7-8

## 微电子科学与工程专业本科培养计划

### Undergraduate Program for Specialty in Microelectronic Science and Engineering

#### 一、培养目标

##### I . Program Objectives

本专业培养德、智、体、美、劳全面发展，掌握微电子科学与工程专业必需的基础知识、基本理论和基本实验技能，能够从事该领域的各种微电子材料、器件、封装、测试、集成电路设计与系统的科研、教学、科技开发、工程技术、生产管理等工作的高级专门人才。

This program trains advanced talents with all-round development of morality, intelligence, physique, aesthetics and labour, with a basic knowledge, theory and experimental skills necessary for Microelectronic Science and Engineering. These talents can be engaged in various works in microelectronic materials, devices, packaging, testing, integrated circuit design and system as well as the scientific research, education, technique development, engineering technology, production management.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

- 1、具有扎实的自然科学基础，良好的人文社会科学基础和外语能力；
- 2、掌握本专业领域较宽的基础理论知识，主要包括固体物理、半导体物理、微电子材料、微电子器件、集成电路设计等方面的基础理论知识；在本专业领域内具备从事科学研究的能力；
- 3、受到良好的工程实践训练，掌握各种微电子器件与集成电路的分析、设计与制造方法，具有独立进行微电子材料及器件性能分析、集成电路设计、微电子工艺流程的基本能力；具备一定的工程开发和组织管理能力；
- 4、了解本专业的最新发展动态和发展前景，了解微电子产业的发展状况。

The program requires that the learners have the knowledge and abilities listed as follows:

1. Have solid foundation in natural science, basic fine knowledge in humanities and social sciences and good foreign language skills;
2. Master wide branch of fundamental theoretical knowledge of this specialty, which mainly include the solid state physics, semiconductor physics, microelectronic materials, microelectronic devices, integrated circuit design and so on. Master the ability to conduct scientific research in the field of this specialty;
3. Have good trainings in engineering practice, master the analysis, design and fabrication methods of different kinds of microelectronic devices and integrated circuits, have the fundamental ability to independently deal with the performance analysis of microelectronic materials and devices, integrated circuit design and microelectronics processing. Master the ability of engineering development and organization management;
4. Have the knowledge of the latest developments and prospects in this specialty, have the knowledge of the current situation of microelectronic industry.

### 三、培养特色

#### III. Program Highlights

本专业以微纳电子材料和工艺为基础，以微纳电子器件和集成电路制造为核心，以集成电路设计及其系统应用为方向；坚持理工结合，重视基础理论，强调实践技能，培养“基础-应用”与“器件-系统”相结合的综合思考及横向思维的能力，培养具有良好科学素养、微纳电子材料-器件-电路-版图-工艺-系统的综合设计与研究能力和组织管理能力的工程技术与科研人才。

Based on micro-/nano- electronics materials and processing, taking micro-/nano- electronic devices and integrated circuits fabrication as the core, oriented in integrated circuit design and its system application, this program insists on the combination of science and engineering, values the theoretical foundation and emphasizes the practical skills. By training the ability of comprehensive and lateral thinking with the combination of “basis-to-application” and “devices-to-system”, this program aims at cultivating scientific and engineering talents with good scientific quality, capability in integrated design of micro-/nano- electronics material-devices-circuits-layout-processing-systems, as well as the ability of research and organization management.

### 四、主干学科

#### IV. Main Discipline

电子科学与技术

Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.75 学分。

Minimum Credits of Curricular(Comprising course system and intensified internship practical training) : 162.75 credits.

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：5 学分。

Minimum Extracurricular Credits : 5 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：在本专业范围内完成专业任选课程累积不低于 15 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented courses offered by Specialty, accumulated no less than 15 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

## 1. 课程体系学时与学分

## Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	588/30	18.4
		选修	160/10	6.1
学科基础课程		必修	1048/60.75	37.4
专业课程	专业核心课程	必修	384/23	14.1
	专业选修课程	选修	400/25	15.4
集中性实践教学环节		必修	32w/14	8.6
合计			2580+32w/162.75	100
其中, 总实验 (实践) 学时及占比			764	25.0

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	588/30	18.4
		Elective	160/10	6.1
Discipline-related Courses		Required	1048/60.75	37.4
Specialty Courses	Specialty Core Courses	Required	384/23	14.1
	Specialty Elective Courses	Elective	400/25	15.4
Practical Training		Required	32w/14	8.6
Total			2580+32w/162.75	100
Practicum Credits			764	25.0

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	7.1
专业认知实验	必修	1W/0.5	3.6
工程训练	必修	2W/1	7.1
生产实习	必修	3W/1.5	10.7
课程设计	必修	8W/4	28.6
毕业设计 (论文)	必修	16W/6	42.9
合计		32W/14	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	7.1
Experiments for Specialty Cognition	Required	1W/0.5	3.6
Engineering Training	Required	2W/1	7.1
Engineering Internship	Required	3W/1.5	10.7
Course Project	Required	8W/4	28.6
Undergraduate Thesis	Required	16W/6	42.9
Total		32W/14	100

## 3. 课外学分

## Extracurricular Credits



华中科技大学 2022 级本科专业培养计划

序号	名 称	要 求	课外学分
1	思政课社会实践（必修）	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育（必修）	32 学时	2
4	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	论文	在全国性及国际期刊或会议发表论文	每篇论文
7	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements	Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score	2
2	Community Engagement	Submitting a report and passing the oral defense	2
		Individuals awarded "Active Participant" / Teams awarded "Excellent Performance" by HUST or Hubei Youth League Committee	2
3	Labor education	Practical Service	Pass
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher
		National Computer Rank Examination	Certificate (Grade 1 / 2)
		Qualifications for Computer and Software Technology Proficiency	Programmer
			Senior Programmer
			System Analyst
5	Competitions	University Level	First Prize
			Second Prize
			Third Prize
		Provincial Level	First Prize
			Second Prize
			Third Prize
		National Level	First Prize
			Second Prize
			Third Prize
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主干课程 Main Courses in Specialty

量子力学 Quantum Mechanics、固体物理 Solid State Physics、半导体物理 Semiconductor Physics、微电子材料 Microelectronic Materials、微电子器件与 IC 设计（一）Microelectronic Devices and IC design (I)、微电子工艺学 Microelectronic Process、CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit、数字集成电路基础（二）Fundamentals of Digital IC (II)、微电子封装与测试 Microelectronic Packaging and Testing.

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

光电信息技术导论 Introduction to Photonics and Electronics Technology、专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course :

微电子器件与 IC 设计（一）Microelectronic Devices and IC Design (I)、CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit、微电子工艺学 Microelectronic Process

创新实践训练课程 Innovative Practice Training Course :

微电子器件建模创新实践 Innovation Practice for Modeling of Microelectronic Devices、微电子工艺创新实践 Innovation Practice for Microelectronic Fabrication、集成电路设计创新实践 Innovation Practice for IC design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

专业认知实验 Experiments for Specialty Cognition、软件课程设计 Course Project for Software Design、集成电路设计创新实践 Innovation Practice for IC design、微电子工艺创新实践 Innovation Practice for Microelectronic Fabrication、微电子器件建模创新实践 Innovation Practice for Modeling of Microelectronic Devices、微电子专业基础实验 Specialized Fundamental Experiments of Microelectronics、科研创新实践 Scientific Research and Innovation Practice、专业实习 Engineering Internship、毕业设计 Undergraduate Thesis.

## 九、教学进程计划表

### IX. Course Schedule

院（系）：光学与电子信息学院

专业：微电子科学与工程

School (Department): School of Optical and Electronic Information

Major: Microelectronic Science and Engineering

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
Essential- Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）（上） Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分（一）（下） Calculus ( II )	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments ( II )	24	0.75	24		3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related Courses	必修 Required	OEI0621	光电信息技术导论 Introduction to Photonics and Electronics Technology	24	1.5			1、5、7
	必修 Required	EEE0721	电路理论（五） Circuit Theory (V)	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit Logic Design	56	3.5			4
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiment	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4
专业核心课程 Specialty Core Courses	必修 Required	OEI2111	固体物理 Solid State Physics	48	3			5
	必修 Required	OEI2041	半导体物理（一） Semiconductor Physics (I)	48	3			5
	必修 Required	OEI2271	微电子器件与 IC 设计（一） Microelectronic Devices and IC Design (I)	56	3.5			6
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			6
	必修 Required	OEI2281	微电子学专业基础实验 Specialized Fundamental Experiments of Microelectronics	32	1	32		5
	必修 Required	OEI2131	微电子材料 Microelectronic Materials	40	2.5			6
	必修 Required	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6
	必修 Required	OEI2251	数字集成电路基础（二） Fundamentals of Digital Integrated Circuit (II)	40	2.5			5
	必修 Required	OEI2261	微电子封装与测试 Microelectronic Packaging and Testing	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			专业选修课程 Elective Courses in Specialty					
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Principle of Modern Chemistry ( II )	32	2			3
	选修 Elective	OEI5601	微电子技术前沿报告 Frontiers Report in Microelectronic Technology	32	2			5
	选修 Elective	OEI5641	微纳器件分析技术 Micronanoelectronic Device Analysis Technology	32	2			5
	选修 Elective	OEI5301	硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System	32	2			5
	选修 Elective	OEI5721	类脑计算与器件 Brain-inspired Computing and Devices	32	2			5
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensor	32	2			6
	选修 Elective	OEI5671	信息存储技术基础 Information Storage Technology	32	2			6
	选修 Elective	OEI5481	纳电子器件 Nanoelectronic Devices	40	2.5			6
	选修 Elective	OEI5311	微电子器件可靠性技术基础 Fundamental Reliability Technology of Microelectronic Devices	32	2			6
	选修 Elective	OEI5021	MEMS 系统与应用 MEMS System and Application	32	2			6
	选修 Elective	OEI5541	太阳能电池 Solar Cell Technology	32	2			6
	选修 Elective	OEI5571	微波半导体器件 Microwave Semiconductor Devices	32	2			6
	选修 Elective	OEI5351	光电子器件导论 Introduction to Optoelectronic Devices	32	2			7
	选修 Elective	OEI5151	多媒体原理与技术 Theory and Technology for Multimedia	32	2			7
	选修 Elective	OEI5041	半导体功率器件 Semiconductor Power Devices	32	2			7
	选修 Elective	OEI5261	生物芯片技术 Biochip Technology	32	2			7
	选修 Elective	OEI5651	显示技术 Electronic Display Technology	32	2			7
	选修 Elective	OEI5401	化合物半导体器件 Compound Semiconductor Devices	32	2			7
	选修 Elective	OEI5711	自旋电子学器件 Spintronics	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1w	0.5			1
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2w	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2w	1			4
	必修 Required	OEI3811	微电子器件建模创新实践 Innovation Practice for Modeling of Microelectronic Devices	2w	1			6
	必修 Required	OEI3711	生产实习 Engineering Internship	3w	1.5			6
	必修 Required	OEI3821	微电子工艺创新实践 Innovation Practice for Microelectronic Fabrication	2w	1			6
	必修 Required	OEI0071	集成电路设计创新实践 Innovation Practice for IC Design	2w	1			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16w	6			7-8

## 微电子科学与工程专业辅修专业培养计划

### Undergraduate Program for Auxiliary Specialty in Microelectronic Science and Engineering

#### 一、培养目标

##### I . Educational Objectives

本专业培养掌握微电子科学与工程专业必需的基础知识、基本理论和基本实验技能，能够从事该领域的各种微电子材料、器件、封装、测试、集成电路设计与系统的科研、教学、科技开发、工程技术、生产管理等工作的高级专门人才。

This program trains advanced talents with basic knowledge, theory and experimental skills necessary for Microelectronic Science and Engineering. These talents can be engaged in various works in microelectronic materials, devices, packaging, testing, integrated circuit design and system as well as the scientific research, education, technique development, engineering technology, production management.

#### 二、学分

##### II . Credits

完成学业最低学分要求：23

Minimum Course Credits : 23

其中：

Including：

学科基础课程：15 学分

Basic Courses in Discipline: 15

学科专业课程：8 学分

Courses in Specialty: 8

#### 三、教学进程计划表

##### III . Table of Teaching Schedule

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in Discipline	必修 Required	OEI2111	固体物理 Solid State Physics	48	3			5
	必修 Required	OEI2041	半导体物理（一） Semiconductor Physics ( I )	48	3			5
	必修 Required	OEI2271	微电子器件与 IC 设计（一） Microelectronic Devices and IC Design ( I )	56	3.5			6
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			6
	必修 Required	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科专业课程 Courses in Specialty	选修 Elective	OEI5721	类脑计算与器件 Brain-inspired Computing and Devices	32	2			5
	选修 Elective	OEI5641	微纳器件分析技术 Micronanoelectronic Device Analysis Technology	32	2			5
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensor	32	2			6
	选修 Elective	OEI5671	信息存储技术基础 Information Storage Technology	32	2			6
	选修 Elective	OEI5481	纳电子器件 Nanoelectronic Devices	32	2			6
	选修 Elective	OEI5311	微电子器件可靠性技术基础 Fundamental Reliability Technology of Microelectronic Devices	32	2			6
	选修 Elective	OEI5021	MEMS 系统与应用 MEMS System and Application	32	2			6
	选修 Elective	OEI5351	光电子器件导论 Introduction to Optoelectronic Devices	32	2			7
	选修 Elective	OEI5041	半导体功率器件 Semiconductor Power Devices	32	2			7
	选修 Elective	OEI5261	生物芯片技术 Biochip Technology	32	2			7
	选修 Elective	OEI5401	化合物半导体器件 Compound Semiconductor Devices	32	2			7
	选修 Elective	OEI5711	自旋电子学器件 Spintronics	32	2			7



## “王大珩”光电创新实验班本科培养计划

### Undergraduate Experimental Program in Optoelectronic Information Science and Technology for Wang Daheng Class

#### 一、培养目标

##### I . Program Objectives

培养德、智、体、美、劳全面发展，具有系统扎实的光电学科理论基础和专业知识、良好的人文素质和创新精神，学术视野开阔，科学研究能力强，具备国际竞争力的拔尖创新人才。毕业生能在研究院所、高等院校、光电和信息产业部门及其相关领域从事光电信息科学与技术的前沿研究、设计与开发等方面的工作。

It aims to cultivate top-notch innovative talents with all-round development of morality, intelligence, physical education, aesthetics and labor, systematic and solid theoretical foundation and professional knowledge of optoelectronic discipline, good humanistic quality and innovative spirit, broad academic vision, strong scientific research ability and international competitiveness. Graduates can be engaged in cutting-edge research, design and development of optoelectronic information science and technology in research institutes, colleges and universities, optoelectronic and information industry departments and related fields.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 扎实的数理基础；
2. 熟练掌握光学与光电子学、电子与信息科学的基础理论和方法；
3. 分析解决本学科领域内科学与技术问题的能力；
4. 熟悉光电信息科技的发展动态和前沿；
5. 外语应用能力强；
6. 出色的文献检索、资料综述和撰写科学论文的能力；
7. 较好的人文社科知识和人文素质，以及较强的协调、组织能力；
8. 创新精神强。

As students of this program, you will gain:

1. Solid grounding in maths and physics;
2. Basic theories and methods of Optics, Optoelectronics, Electronics and Information Science;
3. The competency in solving the problems in specialty of scientific research and engineering;
4. Knowledge of the development of the discipline;
5. Mastery of English;
6. Basic methods of literature survey, file retrieving and scientific thesis writing ability;
7. Solid grounding in humanities and arts and ability of managing and organizing;
8. Innovative thinking.

#### 三、培养特色

##### III . Program Highlights

指导思想：拓宽学科基础，重视科学实践，强调拔尖研究型人才的良好思想品德和心理素质训练，强调数理基础与专业能力结合，强调厚积薄发的长线培养模式，坚持理工交叉，突出专业特色，培养能从事跨专业乃至跨学科综合研究和高层次技术开发的优秀人才。

强调学生未来在学术研究领域的发展潜力，突出数学物理基础能力。

重视拔尖学生的个性特质，从大学一年级开始，由单独的学业导师为学生量身定制个性化的理论、实验和科研实践训练内容，培养学生自主创新、主动实践、沟通交流和团队协作的能力。

充分利用武汉光电国家研究中心以及光学与电子信息学院的多学科创新平台、校企合作渠道和国际交流机会，以及师资队伍构成多样化的特点，培养学生自主创新、主动实践、团队协作和多学科交叉能力，以及国际视野和跨文化交流能力。

为学生创造充分参与实际科学研究和国际国内学术交流的条件。

Instruction: encourage students to be self-learning, initiative-practice, innovation dedicative, and aiming for excellence. To establish a solid foundation in math-physics, broaden the subject groundings with inter-discipline development in Science and Engineering, to become high level talents for advanced scientific research and highly sophisticated technology development.

To emphasize the development of long-term potential capacity for fundamental research with vital significance, enhance the capability in mathematics and basic physics. Personal advisor will be provided from year 1 to implement personal program for shaping students' capability in innovation, practice, team-building and communication

The research platform in the university including Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information will be fully utilized for the education and training, to provide world class advisor and international exchange opportunity.

Academic supervisor and industry advisor will work together to facilitate efficient personal training process for students.

#### 四、主干学科

#### IV. Main Disciplines

光学工程

Optical Engineering

#### 五、学制与学位

#### V. Program Length and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：160.75 学分。

Minimum Credits of Curricular(Comprising course system and intensified internship practical training) : 160.75 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：7 学分。

Minimum Extracurricular Credits : 7 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：四选一的专业方向选修模块（8.5 学分）及其对应的课程设计（1.0 学分）；专业任选课程（不低于 15.5 学分），其中在本专业范围内完成专业任选课程累积不低于 5.5 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented module (8.5 credits) chosen one out of four and their corresponding Course Project (1.0 credits); Specialty-oriented courses (not less than 15.5 credits), of which, the elective courses offered by Specialty, accumulated no less than 5.5 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	604/31	19.3
		选修	160/10	6.2
学科基础课程		必修	1024/59.25	36.9
专业课程	专业核心课程	必修	400/22.5	14.0
	专业选修课程	选修	384/24	14.9
集中性实践教学环节		必修	30w/13	8.1
		选修	2w/1	0.6
合计			2572+32w/160.75	100
其中，总实验（实践）学时及占比			812	26.3

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	604/31	19.3
		Elective	160/10	6.2
Discipline-related Courses		Required	1024/59.25	36.9
Specialty Courses	Specialty Core Courses	Required	400/22.5	14.0
	Specialty Oriented Courses	Elective	384/24	14.9
Practical Training		Required	30w/13	8.1
		Elective	2w/1	0.6
Total			2572+32w/160.75	100
Practicum Credits			812	26.3

### 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践环节总学分的比例（%）
军事训练	必修	2w/1	7.1
专业认知实验	必修	1w/0.5	3.7
光电科学认知实践初步	必修	2w/1	7.1
软件课程设计	必修	2w/1	7.1
光学课程设计	必修	2w/1	7.1
工程训练	必修	2w/1	7.1
光电创新项目实践	必修	3w/1.5	10.8
专业方向课程设计	选修	2w/1	7.1
毕业设计（论文）	必修	16w/6	42.9
合 计		32w/14	100

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Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	7.1
Experiments for specialty cognition	Required	1w/0.5	3.7
Professional Practice on Optoelectronic Science	Required	2w/1	7.1
Course Project for Software Design	Required	2w/1	7.1
Course Project for Optical Design	Required	2w/1	7.1
Engineering Training	Required	2w/1	7.1
Optoelectronic Innovative Project	Required	3w/1.5	10.8
Course Project in Specialty Tracks	Elective	2w/1	7.1
Undergraduate Thesis	Required	16w/6	42.9
Total		32w/14	100

3. 课外学分

Extracurricular Credits

序号	名 称	要 求	课外学分
1	思政课社会实践（必修）	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育（必修）	32 学时	2
4	英语及计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	论文	在全国性及国际期刊或会议发表论文	每篇论文
7	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	Labor education	Practical Service	Pass	2
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher	2
		National Computer Rank Examination	Certificate (Grade 1 / 2)	2

continue

No.	Activities	Requirements		Extracurricular Credits
4	Examinations in English and Computer	Qualifications for Computer and Software Technology Proficiency	Programmer	2
			Senior Programmer	3
			System Analyst	4
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper	2-3
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution	1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主干课程 Main Courses in Specialty

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、光电探测与信号处理 Optoelectronic Detection & Signal Processing、光纤光学 Fiber Optics、光纤通信技术 Optical Fiber Communication Technology、单片机原理及应用 Principle and Application of Single Chip Microcomputer、信号与线性系统 Signals and Linear Systems、电动力学 Electrodynamics、量子力学 Quantum Mechanics、热力学与统计物理 Thermodynamics and Statistical Physics

#### （二）创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

科学思维与研究方法 Method of Scientific Thinking and Research、专业认知实验 Experiments for Specialty Cognition、光电科学认知实践初步 Preliminary Practice on Optoelectronic Science

创新能力培养课程 Innovative Ability Training Course :

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology

创新实践训练课程 Innovative Practice Training Course :

光电创新项目实践 Optoelectronic Innovative Project

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

课程设计 Course Project : 软件课程设计 Course Project for Software Design、光学课程设计 Course Project for Optical Design、专业方向课程设计 Course Project in Specialty Tracks

集中实践教学环节 Intensified Internship and Practical Training: 专业认知实验 Experiments for Specialty Cognition、光电创新项目实践 Optoelectronic Innovative Project、科研创新实践 Scientific

Research and Innovation Practice、毕业设计 Undergraduate Thesis

专业实验 Specialized Experiments：应用光学实验 Applied Optics Experiments、物理光学实验 Physical Optics Experiments、激光实验 Lasers Experiments、光纤光学实验 Fiber Optics Experiments、光电技术实验 Optoelectronic Technology Experiments

## 九、教学进程计划表

## IX. Course Schedule

院（系）：光学与电子信息学院

专业：光电信息科学与工程

School (Department): School of Optical and Electronic Information

Major: Optoelectronic Information Science and Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 General Education Core Curriculum	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	QMX0011	科学思维与研究方法 Method of Scientific Thinking and Research	16	1			1
	必修 Required	RMW0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0551	高等数学 (A) 上 Calculus (I)	88	5.5			1
	必修 Required	MAT0531	高等数学 (A) 下 Calculus (II)	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments (I)	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EEE0721	电路理论 (五) Circuit Theory (V)	64	4			2
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0591	模拟电子技术 (二) Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学 (二) Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2331	应用光学实验 Applied Optics Experiments	16	0.5	16		5
	必修 Required	OEI2061	电动力学 Electrodynamics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2301	物理光学实验 Physical Optics Experiments	16	0.5	16		5
	必修 Required	OEI2161	光电探测与信号处理 Optoelectronic Detection and Signal Processing	48	3			5
	必修 Required	OEI2121	光电技术实验 Optoelectronic Technology Experiments	16	0.5	16		5
	必修 Required	OEI2151	激光原理与技术 Laser Theory and Technology	64	4			6
	必修 Required	OEI2191	激光实验 Lasers Experiments	16	0.5	16		6
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2181	光纤光学实验 Fiber Optics Experiments	16	0.5	16		6
专业选修课程 Specialty-oriented Courses			专业方向选修模块（四选一） Specialty-oriented Module (Choose One out of Four)					
			A. 激光科学与工程专业方向课程 Track A: Laser Science & Engineering					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5431	激光器件与系统 Laser Devices and Systems	40	2.5			6
			B. 光电子器件与集成专业方向课程 Track B : Optoelectronic Devices and Integration					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			6
			C. 光通信与光网络技术专业方向课程 Track C: Optical Communication & Optical Network Technology					



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
			D. 光电系统与信息处理专业方向课程 Track D : Optoelectronic System & Information Processing					
	选修 Elective	OEI5561	通信原理（一） Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5341	光电仪器学 Optoelectronic Instrumentation	40	2.5			6
			专业任选课 Elective Courses in Specialty					1-7
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Fundamental of Modern Chemistry (II)	32	2			3
	选修 Elective	OEI5611	微电子器件与 IC 设计（二） Microelectronic Device and IC Design ( II )	40	2.5			5
	选修 Elective	OEI5731	超快激光微纳制造原理与技术 Principle of Ultrafast Laser Micro-nano Manufacturing and Technology	32	2			6
	选修 Elective	OEI5331	光电图像处理 Optoelectronic Image Processing	40	2.5			7
	选修 Elective	OEI5511	生物医学光学原理与成像技术 Biomedical Optics: Principles and Imaging	32	2			7
	选修 Elective	OEI5441	激光与物质相互作用 Laser- Matter Interaction	32	2			7
	选修 Elective	OEI5631	微纳光电系统 Micro and Nano Optoelectronic System	40	2.5			7
	选修 Elective	OEI5421	激光光谱 Laser Spectrum	40	2.5			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting & Display Technology	32	2			7
	选修 Elective	OEI5031	半导体薄膜材料 Semiconductor Thin Films Materials	40	2.5			7
	选修 Elective	OEI5221	光互连与光交换网络技术 Technology for Optical Interconnection & Optical Switching Network	32	2			7
	选修 Elective	OEI5521	生物医学光子学基础 Fundamentals of Biophotonics	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Specialty-oriented Courses 专业选修课程	选修 Elective	OEI5471	精密机械设计与 CAD Fine Mechanics Design & CAD	40	2.5			7
	选修 Elective	OEI5661	现代光学实验 Modern Optical Experiment	24	1	24		7
	选修 Elective	OEI5371	光纤传感及网络技术 Fiber Sensing and Network Technology	32	2			7
	选修 Elective	OEI5211	现代材料分析技术 Modern Analytical Technologies for Materials	32	2			7
Practical Training Items 实践环节	必修 Required	RMWZ3511	军事训练 Military Training	2W	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1W	0.5			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2W	1			4
	必修 Required	OEI3701	软件课程设计 Software Programming Course Project	2W	1			1
	必修 Required	OEI3551	光电科学认知实践初步 Preliminary Practice on Optoelectronic Science	2W	1			2
	必修 Required	OEI3611	光学课程设计 Optical Design Course Project	2W	1			5
	必修 Required	OEI3541	光电创新项目实践 Optoelectronic Innovative Project	3W	1.5			6
	选修 Elective	OEI3621	激光科学与工程专业方向课程设计 Course Project in Laser Science & Engineering	2W	1			6
	选修 Elective	OEI3591	光电子器件与集成专业方向课程设计 Course Project in Optoelectronic Devices and Integration	2W	1			6
	选修 Elective	OEI3601	光通信与光网络技术专业方向课程设计 Course Project in Optical Communication & Optical Network Technology	2W	1			6
	选修 Elective	OEI3571	光电系统与信息处理专业方向课程设计 Course Project in Optoelectronic System & Information Processing	2W	1			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16W	6			7-8

## 光电卓越计划实验班本科培养计划

### Undergraduate Experimental Program in Optoelectronic Information Science and Technology for Exemplary Engineer Education

#### 一、培养目标

##### I . Program Objectives

培养德、智、体、美、劳全面发展，具备坚实的光电专业理论基础、工程实践能力和相关创业能力，创新意识、创业素质和综合能力强，具备多学科视野和国际竞争力的光电领域研究型高端工程技术领军人才。毕业生能在光电产业部门、科研院所、高等院校及其相关领域创造性地从事光。

It aims to cultivate research-oriented and high-end engineering technology leaders in the field of optoelectronics with all-round development of morality, intelligence, physical education, aesthetics and labor, solid theoretical basis of optoelectronics, engineering practice ability and relevant entrepreneurial ability, strong innovation consciousness, entrepreneurial quality and comprehensive ability, and multi-disciplinary vision and international competitiveness. Graduates can be creatively engaged in the research, development and management of optoelectronic information engineering in optoelectronic industry departments, scientific research institutes, colleges and universities and other related fields.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 扎实的数理基础；
2. 熟练掌握光学与光电子学、电子与信息科学的基本理论和方法；
3. 分析解决本学科领域内工程技术问题的能力；
4. 了解本学科重大工程技术的发展动态和前沿；
5. 外语应用能力强；
6. 出色的文献检索、资料综述和撰写科技论文的能力；
7. 较好的创业素质，较强的项目协调、组织能力；
8. 创新精神强。

As students of this program, you will gain:

1. Solid grounding in maths and physics;
2. Basic theories and methods of Optics, Optoelectronics, Electronics and Information Science;
3. The competency in solving the problems in specialty of scientific research and engineering;
4. Knowledge of the development of the discipline;
5. Mastery of English;
6. Basic methods of literature survey, file retrieving and scientific thesis writing ability;
7. Solid grounding in humanities and arts and ability of managing and organizing;
8. Innovative thinking.

### 三、培养特色

#### III. Program Highlights

指导思想：鼓励和引导学生树立“追求卓越、致力创新、自主学习、主动实践”的学习理念，实行“厚基础、重实践、校企联动、发展个性”的培养理念。

通过校企联合培养、双导师制等强化工程实践和创新合作能力。在企业进行工程实践训练的时间累计不少于 1 年。其中，大四下学期在企业进行为期半年的毕业设计，并且从大一开始，利用每年的假期在企业进行专题工程实训，累计超过半年时间。在校学习期间，部分课程由企业工程师参与讲授，在校进行的项目训练选题来自于企业，并由企业参与成绩评价。

在学生培养的整个过程中，采用特别设计的含 CDIO 全过程的项目将所学课程串联起来，加强工程项目构思、设计、实现和运作能力的培养和训练。在高年级期间，则通过综合性的项目训练学生综合运用所学知识，创新性的解决工程实际问题的能力。

充分利用武汉光电国家研究中心以及光学与电子信息学院的多学科创新平台、校企合作渠道和国际交流机会，以及师资队伍构成多样化的特点，培养学生自主创新、主动实践、团队协作和多学科交叉能力，以及国际视野和跨文化交流能力。

重视拔尖学生的个性特质，结合相关企业对人才技能的特殊需求，由学业导师和企业导师为学生量身定制个性化的理论、实验和实践训练内容。

Instruction: encourage students to be self-learning, initiative-practice, innovation dedicative, and aiming for excellence. To establish a solid foundation in math-physics, broaden the subject groundings with inter-discipline development in Science and Engineering, interact between academy and industry, and to develop independent individuality for R&D.

The students are selected from fresh undergraduates university wide, 30 students per grade. A 4+2 program will be applied including 4 years' undergraduate study and 2 years' master of engineering study. During the undergraduate, it will follow 3+1 program in which students are required to conduct at least 1 year internship in industry for engineering practice. A CDIO featured specially designed program will be used to enhance the capability of problem solving for advanced engineering application in optoelectronics domain.

The research platform in the university including Wuhan National Laboratory for Optoelectronics and School of Optical and Electronic Information will be fully utilized for the education and training, to provide world class advisor and international exchange opportunity.

Academic supervisor and industry advisor will work together to facilitate efficient personal training process for students.

### 四、主干学科

#### IV. Main Discipline

光学工程

Optical Engineering

### 五、学制与学位

#### V. Program Length and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

## 六、学时与学分

### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：161.25 学分。

Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 161.25 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：7 学分。

Minimum Extracurricular Credits : 7 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 25 credits

包括：四选一的专业方向选修模块（8.5 学分）及其对应的课程设计（1.0 学分）；专业任选课程（不低于 15.5 学分），其中：跨专业选修课程累积不低于 7 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented module (8.5 credits) chosen one out of four and their corresponding Course Project (1.0 credits); Specialty-oriented courses (not less than 15.5 credits), of which, the elective courses offered by Cross-specialty, accumulated no less than 7 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	604/31	19.2
		选修	160/10	6.2
学科基础课程		必修	1024/59.25	36.7
专业课程	专业核心课程	必修	400/22.5	14.0
	专业选修课程	选修	384/24	14.9
集中性实践教学环节		必修	31w/13.5	8.4
		选修	2w/1	0.6
合计			2572+33w/161.25	100
其中，总实验（实践）学时及占比			828	26.7

Course Type		Required / Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	604/31	19.2
		Elective	160/10	6.2
Discipline-related Courses		Required	1024/59.25	36.7
Specialty Courses	Specialty Core Courses	Required	400/22.5	14.0
	Specialty Oriented Courses	Elective	384/24	14.9
Practical Training		Required	31w/13.5	8.4
		Elective	2w/1	0.6
Total			2572+33w/161.25	100
Practicum Credits			828	26.7

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	6.9
光电信息工程企业项目实践	必修	3W/1.5	10.4
光电企业认知实践	必修	1W/0.5	3.4
学科交叉综合训练	必修	2W/1	6.9
软件课程设计	必修	2W/1	6.9
工程训练	必修	2W/1	6.9
光学课程设计	必修	2W/1	6.9
专业方向课程设计	选修	2W/1	6.9
专业认知实验	必修	1W/0.5	3.4
毕业设计 (论文)	必修	16W/6	41.4
合计		33W/14.5	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	6.9
Engineering Internship	Required	3W/1.5	10.4
OptoElectrics Industry Practice	Required	1W/0.5	3.4
Comprehensive Training for Interdiscipline	Required	2W/1	6.9
Course Project for Software Design	Required	2W/1	6.9
Engineering Training	Required	2W/1	6.9
Course Project for Optical Design	Required	2W/1	6.9
Course Project in Specialty Tracks	Elective	2W/1	6.9
Experiments for Specialty Cognition	Required	1W/0.5	3.4
Undergraduate Thesis	Required	16W/6	41.4
Total		33W/14.5	100

## 3. 课外学分

## Extracurricular Credits

序号	名 称	要 求		课外学分
1	思政课社会实践（必修）	提交调查报告并达标		2
2	社会实践活动	提交社会调查报告，通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
3	劳动教育（必修）	32 学时		2
4	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者	2
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文	在全国性及国际期刊或会议发表论文	每篇论文	2-3
7	科研创新实践（必修）	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项	1-3

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。

华中科技大学 2022 级本科专业培养计划

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	Labor education	Practical Service	Pass	2
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher	2
		National Computer Rank Examination	Certificate (Grade 1 / 2)	2
		Qualifications for Computer and Software Technology Proficiency	Programmer	2
			Senior Programmer	3
			System Analyst	4
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper	2-3
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution	1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation（Entrepreneurship）Courses

#### （一）专业主干课程 Main Courses in Specialty

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、光电探测与信号处理 Optoelectronic Detection & Signal Processing、光纤光学 Fiber Optics、光纤通信技术 Optical Fiber Communication Technology、单片机原理及应用 Principle and Application of Single Chip Microcomputer、信号与线性系统 Signals and Linear Systems、电动力学 Electrodynamics、量子力学 Quantum Mechanics、热力学与统计物理 Thermodynamics and Statistical Physics

#### （二）创新（创业）课程 Innovation（Entrepreneurship）Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course：

科学思维与研究方法 Method of Scientific Thinking and Research、专业认知实验 Experiments for Specialty Cognition、光电企业认知实践 OptoElectrics Enterprise Cognition Practice

创新能力培养课程 Innovative Ability Training Course：

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、跨专业选修课程 Interdisciplinary Elective Courses

创新实践训练课程 Innovative Practice Training Course：

学科交叉综合训练 Interdisciplinary Comprehensive Training

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

课程设计 Course Project : 软件课程设计 Course Project for Software Design、光学课程设计 Course Project for Optical Design、专业方向课程设计 Course Project in Specialty Tracks

集中实践教学环节 Intensified Internship and Practical Training: 专业认知实验 Experiments for Specialty Cognition、光电企业认知实践 OptoElectrics Enterprise Cognition Practice、学科交叉综合训练 Comprehensive Training for Interdiscipline、科研创新实践 Scientific Research and Innovation Practice、毕业设计 Undergraduate Thesis

专业实验 Specialized Experiments : 应用光学实验 Applied Optics Experiments、物理光学实验 Physical Optics Experiments、激光实验 Lasers Experiments、光纤光学实验 Fiber Optics Experiments、光电技术实验 Optoelectronic Technology Experiments

## 九、教学进程计划表

### IX. Course Schedule

院（系）：光学与电子信息学院

专业：光电信息科学与工程

School (Department): School of Optical and Electronic Information

Major: Optoelectronic Information Science and Engineering

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质 教育 通识 课程 General Education Core Curriculum	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0002	综合英语（一） Comprehensive English ( I )	32	2			1
	必修 Required	SFL0012	综合英语（二） Comprehensive English ( II )	32	2			2
	必修 Required	SFL0131	综合英语（三） Comprehensive English ( III )	16	1			3
	必修 Required	SFL0141	综合英语（四） Comprehensive English ( IV )	16	1			4
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
	必修 Required	PHE0022	大学体育（三） Physical Education (III)	24	1			5-6
	必修 Required	QMX0011	科学思维与研究方法 Method of Scientific Thinking and Research	16	1			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	高等数学（A）上 Calculus (I)	88	5.5			1
	必修 Required	MAT0531	高等数学（A）下 Calculus (II)	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics (I)	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics (II)	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments (I)	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments (II)	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EEE0721	电路理论（五） Circuit Theory (V)	64	4			2
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4
专业核心课程 Specialty Required Courses	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2331	应用光学实验 Applied Optics Experiments	16	0.5	16		5
	必修 Required	OEI2061	电动力学 Electrodynamics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2301	物理光学实验 Physical Optics Experiments	16	0.5	16		5
	必修 Required	OEI2161	光电探测与信号处理 Optoelectronic Detection and Signal Processing	48	3			5
	必修 Required	OEI2121	光电技术实验 Optoelectronic Technology Experiments	16	0.5	16		5
	必修 Required	OEI2151	激光原理与技术 Laser Theory and Technology	64	4			6
	必修 Required	OEI2191	激光实验 Lasers Experiments	16	0.5	16		6
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2181	光纤光学实验 Fiber Optics Experiments	16	0.5	16		6
			专业方向选修模块（四选一） Specialty-oriented Module (Choose One out of Four)					
专业选修课程 Specialty-oriented Courses			A. 激光科学与工程专业方向课程 A: Laser Science & Engineering					
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5431	激光器件与系统 Laser Devices and Systems	40	2.5			6
			B. 光电子器件与集成专业方向课程 B: Optoelectronic Devices and Integration					

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			6
	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			6
			C. 光通信与光网络技术专业方向课程 C: Optical Communication & Optical Network Technology					
	选修 Elective	OEI5561	通信原理 (一) Principles of Communication	48	3			5
	选修 Elective	OEI5391	光纤通信技术 (一) Optical Fiber Communication Technology	48	3			6
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
			D. 光电系统与信息处理专业方向课程 D : Optoelectronic System & Information Processing					
	选修 Elective	OEI5561	通信原理 (一) Principles of Communication ( I )	48	3			5
	选修 Elective	OEI5391	光纤通信技术 (一) Optical Fiber Communication Technology ( I )	48	3			6
	选修 Elective	OEI5341	光电仪器学 Optoelectronic Instrumentation	40	2.5			6
			专业任选课 Elective Courses in Specialty					1-7
	选修 Elective	MESE0891	工程制图 (一) Engineering Graphics ( I )	40	2.5			1
	选修 Elective	QMX0001	工程导论 Introduction of Engineering	16	1			2
	选修 Elective	OEI2311	现代化学基础 (二) Fundamental of Modern Chemistry ( II )	32	2			3
	选修 Elective	OEI5611	微电子器件与 IC 设计 (二) Microelectronic Device and IC Design ( II )	40	2.5			5
	选修 Elective	OEI5731	超快激光微纳制造原理与技术 Principle of Ultrafast Laser Micro-nano Manufacturing and Technology	32	2			6
	选修 Elective	OEI5331	光电图像处理 Optoelectronic Image Processing	40	2.5			7
	选修 Elective	OEI5511	生物医学光学原理与成像技术 Biomedical Optics: Principles and Imaging	32	2			7
	选修 Elective	OEI5441	激光与物质相互作用 Laser- Matter Interaction	32	2			7
	选修 Elective	OEI5631	微纳光电系统 Micro and Nano Optoelectronic System	40	2.5			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5421	激光光谱 Laser Spectrum	40	2.5			7
	选修 Elective	OEI5201	固态照明与显示技术 Solid State Lighting & Display Technology	32	2			7
	选修 Elective	OEI5031	半导体薄膜材料 Semiconductor Thin Films Materials	40	2.5			7
	选修 Elective	OEI5221	光互连与光交换网络技术 Technology for Optical Interconnection & Optical Switching Network	32	2			7
	选修 Elective	OEI5521	生物医学光子学基础 Fundamentals of Biophotonics	32	2			7
	选修 Elective	OEI5471	精密机械设计与 CAD Fine Mechanics Design & CAD	40	2.5			7
	选修 Elective	OEI5661	现代光学实验 Modern Optical Experiment	24	1	24		7
	选修 Elective	OEI5371	光纤传感及网络技术 Fiber Sensing and Network Technology	32	2			7
	选修 Elective	OEI5211	现代材料分析技术 Modern Analytical Technologies for Materials	32	2			7
			跨专业选修课程（须选修 3 门或 3 门以上课程且学分不少于 7 学分） Interdisciplinary Elective Courses (3 or more courses and no less than 7 credits)					
	选修 Elective	MESE5281	机械原理（四） Theory of Machines and Mechanisms (IV)	40	2.5	4		4
	选修 Elective	MESE5891	机械设计(四) Machine Design (IV)	40	2.5			5
	选修 Elective	MESE0621	机械制造技术基础 Fundamentals of Mechanical Manufacturing Technology	40	2.5			4
	选修 Elective	CEM6101	土木工程材料 Civil Engineering Materials	32	2			4
	选修 Elective	CEM5401	房屋建筑学 Building Construction	32	2			5
	选修 Elective	CEM5092	地基处理技术 Ground Improvement Techniques	24	1.5			6
	选修 Elective	BIO5161	化学与生物传感器 Chemical and Biological Sensor	32	2			6
	选修 Elective	BIO5361	生物材料学 Introduction to Biomaterials Science	48	3			5
	选修 Elective	BIO5631	医学影像系统原理 Principles of Medical Imaging Systems	32	2			6
实践环节 Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2W	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1W	0.5			1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2w	1			4
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2w	1			1
	必修 Required	OEI3561	光电企业认知实践 OptoElectrics Enterprise Cognition Practice	1w	0.5			2
	必修 Required	QMX3511	学科交叉综合训练 Interdisciplinary Comprehensive Training	2w	1			7
	必修 Required	OEI3611	光学课程设计 Course Project for Optical Design	2W	1			5
	必修 Required	OEI3581	光电信息工程企业项目实践（结合生产实习） Engineering Internship	3W	1.5			6
	选修 Elective	OEI3621	激光科学与工程专业方向课程设计 Course Project in Laser Science & Engineering	2W	1			6
	选修 Elective	OEI3591	光电子器件与集成专业方向课程设计 Course Project in Optoelectronic Devices and Integration	2W	1			6
	选修 Elective	OEI3601	光通信与光网络技术专业方向课程设计 Course Project in Optical Communication & Optical Network Technology	2W	1			6
	选修 Elective	OEI3571	光电系统与信息处理专业方向课程设计 Course Project in Optoelectronic System & Information Processing	2W	1			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16W	6			7-8

## 集成电路设计与集成系统卓越计划实验班本科培养计划

### Undergraduate Experimental Program in IC Design and Integrated System for Exemplary Engineer Education

#### 一、培养目标

##### I . Program Objectives

培养德、智、体、美、劳全面发展，具备坚实的集成电路与智能系统专业理论基础、工程实践能力和创业能力，创新意识、创业素质和综合能力强，具备多学科视野和国际竞争力的集成电路科学与工程领域研究型高端工程技术人才。毕业生能在集成电路产业部门、科研院所、高等院校及其相关领域创造性地从事集成电路工程相关的研究、开发和管理等工作。

Cultivate moral, intellectual, physical, aesthetic, labor and all-round development, with solid professional theoretical basis, integrated circuits and intelligent system engineering practice ability and entrepreneurial ability, innovation consciousness, entrepreneurial quality and comprehensive ability is strong, competitive integrated circuit on a multidisciplinary field of vision and international science and engineering research high-end engineering and technical personnel. Graduates can creatively engage in the research, development and management of integrated circuit engineering in integrated circuit industry departments, research institutes, universities and other related fields.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 扎实的数理基础；
2. 熟练掌握微电子学与固体电子学、半导体集成电路及嵌入式系统的基本理论和方法；
3. 分析解决本学科领域内工程技术问题的能力；
4. 了解本学科重大工程技术的发展动态和前沿；
5. 外语应用能力强；
6. 出色的文献检索、资料综述和撰写科技论文的能力；
7. 较好的创业素质，较强的项目协调、组织能力；
8. 创新精神强。

Graduates of this specialty are expected to gain:

1. Solid foundation in maths and physics;
2. Basic theories and methods of Microelectronics and solid state electronics, Integrated Circuits and Embedded System;
3. The competency in solving the problems in specialty of scientific research and engineering;
4. Knowledge of the development and frontier of the discipline;
5. Fluent expressiveness in English;
6. Strong ability in literature survey, file retrieving and scientific thesis writing ability;
7. Solid grounding in humanities and arts and ability of managing and organizing;
8. Innovative thinking.

### 三、培养特色

#### III. Program Highlights

指导思想：鼓励和引导学生树立“追求卓越、致力创新、自主学习、主动实践”的学习理念，实行“厚基础、重实践、校企联动、发展个性”的培养理念。

Guiding Ideology: We encourage and guide students to build the learning concept of “pursuit of excellence, devotion to innovation, autonomic learning, and initiative practice”, and execute the talent cultivation based on “emphasis on basis and practice, reinforcement of co-operation between the school and enterprises, and development of personalities”.

培养特色：

Features:

培养对象为面向全国择优录取的优秀本科生，规模为 30 人。按学生自愿参加的原则，择优遴选有志于从事半导体器件及工艺研究、集成电路设计与集成系统研究的优秀学生，组建集成电路设计与集成系统卓越工程师本科班，按集成电路设计与集成系统专业“卓越工程师班”培养方案进行个性化培养。

30 outstanding undergraduates are to be selected from the whole nation. Based on the principle of free will, excellent freshmen will be selected who are willing to devote themselves to researching semiconductor device and process, design and integrated circuit.

在学生培养的整个过程中，采用特别设计的含 CDIO 全过程的项目将所学课程贯通，加强工程项目构思、设计、实现和运作能力的培养和训练。在高年级期间，则通过综合性的项目训练学生综合运用所学知识，创新性的解决工程实际问题的能力。

During the whole talent cultivation process, we will use programs which contain whole procedure of CDIO to connect all the courses, so as to enhance students' ability to compose, design, realize and operate engineering projects. In the senior grades, we will use comprehensive programs in hope of developing students' ability to apply their knowledge and solve engineering practical issues innovatively.

充分利用武汉·中国光谷、国家示范性微电子学院——武汉国际微电子学院、国家集成电路人才培养基地（武汉）以及国家集成电路产教融合创新平台、校企合作渠道和国际交流机会，以及师资队伍构成多样化的特点，培养学生自主创新、主动实践、团队协作和多学科交叉能力，以及国际视野和跨文化交流能力。

Resources including Optical Valley, National Demonstrative School of Microelectronics, National IC Talent Training Base (Wuhan), and National IC Industry-Education Integration Innovation Platform will be fully used, in order to develop students' ability of innovation, practice and cooperation as well as their international view and cross-cultural communication.

重视拔尖学生的个性特质，结合相关企业对人才技能的特殊需求，由学业导师和企业导师为学生量身定制个性化的理论、实验和实践训练内容。

Special attention will be paid to the trait of these outstanding students. Combining requirements of enterprises, the two tutors from school and enterprise will make tailored theoretical and practical training courses for students.

### 四、主干学科

#### IV. Main Discipline

电子科学与技术

Electronic Science and Technology

## 五、学制与学位

### V. Program Length and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

## 六、学时与学分

### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.75 学分。

Minimum Credits of Curricular (Comprising course system and intensified internship practical training): 162.75 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program

完成学业最低课外学分要求：7 学分。

Minimum Extracurricular Credits: 7 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：25 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science): 25 credits

包括：在本专业范围内完成专业任选课程累积不低于 15 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented courses offered by Specialty, accumulated no less than 15 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	604/31	19.1
		选修	160/10	6.1
学科基础课程		必修	1024/59.25	36.4
专业课程	专业核心课程	必修	360/21	12.9
	专业选修课程	选修	400/25	15.4
集中性实践教学环节		必修	37w/16.5	10.1
合计			2548+37w/162.75	100
其中，总实验（实践）学时及占比			860	27.4

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	604/31	19.1
		Elective	160/10	6.1
Discipline-related Courses		Required	1024/59.25	36.4
Specialty Courses	Specialty Core Courses	Required	360/21	12.9
	Specialty Elective Courses	Elective	400/25	15.4
Practical Training		Required	37w/16.5	10.1
Total			2548+37w/162.75	100
Practicum Credits			860	27.4



## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	6.1
专业认知实验	必修	1W/0.5	3.0
生产实习	必修	3W/1.5	9.1
课程设计	必修	8W/4	24.2
工程训练	必修	2W/1	6.1
嵌入式系统创新实践	必修	2W/1	6.1
集成电路工程企业项目实践	必修	3W/1.5	9.1
毕业设计 (论文)	必修	16W/6	36.3
合计		37W/16.5	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	6.1
Experiments for Specialty Cognition	Required	1W/0.5	3.0
Engineering Internship	Required	3W/1.5	9.1
Course Project	Required	8W/4	24.2
Engineering Training	Required	2W/1	6.1
Innovation Practice for Embedded System	Required	2W/1	6.1
IC engineering enterprise project practice	Required	3W/1.5	9.1
Undergraduate Thesis	Required	16W/6	36.3
Total		37W/15.5	100

## 3. 课外学分

## Extracurricular Credits

序号	名 称	要 求		课外学分
1	思政课社会实践 (必修)	提交调查报告并达标		2
2	社会实践活动	提交社会调查报告，通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
3	劳动教育 (必修)	32 学时		2
4	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者	2
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文	在全国性及国际期刊或会议发表论文	每篇论文	2-3
7	科研创新实践 (必修)	参与科研项目（含大学生创新创业项目）	根据时间和成果，每项	1-3

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。

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No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	Labor education	Practical Service	Pass	2
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher	2
		National Computer Rank Examination	Certificate (Grade 1 / 2)	2
		Qualifications for Computer and Software Technology Proficiency	Programmer	2
			Senior Programmer	3
			System Analyst	4
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper	2-3
7	Scientific Research and Innovation Practice	Participate in research projects	Each item based on the contribution	1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation（Entrepreneurship）Courses

#### （一）专业主干课程 Main Courses in Specialty

计算机组成原理 Principles of Computer Organization、处理器体系结构 Processor Architecture、信号与线性系统 Signal and Linear System、嵌入式系统原理与设计 Principles and Design of Embedded System、硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System、微电子工艺学 Microelectronic Process、数字集成电路基础（一） Fundamentals of Digital Integrated Circuit（I）、CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit、高级模拟集成电路设计 Advanced Analog Integrated Circuit Design、半导体器件物理 Physics of Semiconductor Devices.

#### （二）创新（创业）课程 Innovation（Entrepreneurship）Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course：

科学思维与研究方法 Method of Scientific Thinking and Research、专业认知实验 Experiments for Specialty Cognition

创新能力培养课程 Innovative Ability Training Course：

高级模拟集成电路设计 Advanced Analog Integrated Circuit Design、数字集成电路基础（一） Fundamentals of Digital Integrated Circuit（I）、计算机组成原理 Principles of Computer Organization

创新实践训练课程 Innovative Practice Training Course：

全国大学生集成电路创新创业大赛(生产实习期间, 全员参与) China College IC innovation and Entrepreneurship Competition (Full Participation during Engineering Internship)、集成电路工程企业项目实践 Integrated Circuit Engineering Enterprise Project Practice 嵌入式系统创新实践 Innovation Practice for Embedded system

## 八、主要实践教学环节(含专业实验)

### VIII. Practicum Module (experiments included)

专业认知实验 Experiments for Specialty Cognition、集成电路设计与集成系统专业实验 Specialized Experiments of IC Design and Integrated System、软件课程设计 Course Project for Software Design、数字集成电路课程设计 Course Project for Digital IC、模拟集成电路课程设计 Course Project for Analog IC、微电子工艺课程设计 Course Project for Microelectronic Fabrication、嵌入式系统创新实践 Innovation Practice for Embedded system、生产实习 Engineering Internship、科研创新实践 Scientific Research and Innovation Practice、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

### IX. Course Schedule

院(系): 光学与电子信息学院

专业: 集成电路设计与集成系统

School (Department): School of Optical and Electronic Information

Major: Integrated Circuit Design and Integrated System

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语(一) Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语(二) Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育(一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育(二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育(三) Physical Education ( III )	24	1			5-6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	QMX0011	科学思维与研究方法 Scientific Thoughts and Research Methods	16	1			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
			从不同的课程模块中修读若干课程, 美育类课程、大学生心理健康课程均不低于 2 学分, 总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0551	高等数学 (A) 上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	高等数学 (A) 下 Calculus (II)	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics & Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	EEE0721	电路理论 (五) Circuit Theory (V)	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			4
	必修 Required	EIC0591	模拟电子技术 (二) Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0651	电子测试与实验技术 Electronic Testing and Experiment Techniques	48	1.5	48		4
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related General Courses	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4
专业核心课程 Specialty Core Courses	必修 Required	OEI2031	半导体物理（二） Semiconductor Physics (II)	40	2.5			5
	必修 Required	OEI2021	半导体器件物理 Physics of Semiconductor Devices	40	2.5			5
	必修 Required	OEI2241	数字集成电路基础（一） Fundamentals of Digital Integrated Circuit ( I )	56	3.5			5
	必修 Required	OEI2201	集成电路专业基础实验 Specialized Fundamental Experiments Of IC	48	1.5	48		5
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			5
	必修 Required	OEI2221	计算机组成原理 Principles of Computer Organization	56	3.5			5
	必修 Required	OEI2231	嵌入式系统原理与设计 Principles and Design of Embedded System	40	2.5			6
	必修 Required	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6
专业选修课程 Specialty-oriented Courses	选修 Elective	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	选修 Elective	OEI2311	现代化学基础（二） Principle of Modern Chemistry ( II )	32	2			3
	选修 Elective	OEI5801	人工智能导论 Introduction to Artificial Intelligence	32	2			3
	选修 Elective	OEI2111	固体物理 Solid State Physics	48	3			5
	选修 Elective	OEI5071	处理器体系结构 Processor Architecture	40	2.5			6
	选修 Elective	OEI5301	硬件描述语言与数字系统设计 Hardware Description Language and Design of Digital System	32	2			5
	选修 Elective	OEI5791	射频集成电路基础 Fundamentals of Radio Frequency IC	40	2.5			6
	选修 Elective	OEI5761	高级模拟集成电路设计 Advanced Analog Integrated Circuit Design	40	2.5			6
	选修 Elective	OEI5021	MEMS 系统与应用 MEMS System and Application	32	2			6
	选修 Elective	OEI5721	类脑计算与器件 Brain-inspired Computing and Devices	32	2			5
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensors	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5531	数字信号处理 Digital Signal Processing	32	2			6
	选修 Elective	OEI5811	智能计算系统 AI Computing System	32	2			6
	选修 Elective	OEI5311	微电子器件可靠性技术基础 Fundamental of Microelectronics Device Reliability Technology	32	2			6
	选修 Elective	OEI5551	通信原理（二） Principles of communication（II）	32	2			6
	选修 Elective	OEI5781	集成电路科学与工程前沿技术概论 Frontier Introduction to IC Science and Engineering	24	1.5			7
	选修 Elective	OEI5351	光电子器件导论 Introduction to Optoelectronic Device	32	2			7
	选修 Elective	OEI5401	化合物半导体器件 Compound Semiconductor Devices	32	2			7
	选修 Elective	OEI5191	功率集成电路 Power Integrated Circuits	32	2			7
	选修 Elective	OEI5451	集成电路封装与系统测试 Package and System Test for IC	32	2			7
	选修 Elective	OEI5671	信息存储技术基础 Information Storage Technology	32	2			6
实践环节 Practical Training items	必修 Required	RMWZ3511	军事训练 Military Training	2W	1			1
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1W	0.5			1
	必修 Required	ENG3551	工程训练（七） Engineering Training（VII）	2W	1			4
	必修 Required	OEI3711	生产实习 Engineering Internship	3W	1.5			6
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2W	1			1
	必修 Required	OEI3721	数字集成电路课程设计 Course Project for Digital IC Design	2W	1			5
	必修 Required	OEI3671	模拟集成电路课程设计 Course Project for Analog IC Design	2W	1			6
	必修 Required	OEI3741	微电子工艺课程设计 Course Project for Microelectronic Fabrication	2W	1			6
	必修 Required	OEI3831	嵌入式系统创新实践 Innovation Practice for Embedded System	2W	1			7
	必修 Required	OEI0081	集成电路工程企业项目实践 Integrated Circuit Engineering Enterprise Project Practice	3W	1.5			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16W	6			7-8

## 光电信息类本硕博实验班培养计划（本科阶段）

### Undergraduate Program for Bachelor-Master-PHD Experimental Class of Optical and Electronic Information

#### 一、培养目标

##### I . Program Objectives

致力于培养德、智、体、美、劳全面发展，具有坚实的科学与工程理论基础、学科视野宽广、综合素质高、适应未来光电信息科学技术发展需要，在信息的获取、传输、处理、存贮以及信息显示等专业领域中的一个或两个方向具有特色，能在相关领域内具有国际竞争力和领导能力的光电子信息领域的科学与技术领军人才。

This program is dedicated to cultivating leading talents in the field of optical and electronic information science and technology, with comprehensive development in morality, intelligence, physical, aesthetic and labor ability, with solid scientific and engineering theoretical foundation, broad disciplinary vision, high comprehensive quality; meeting the needs of development of optical and electronic information science and technology; with expertise in the fields of information acquisition, transmission, processing, storage, and display; with international competitiveness and leadership capabilities.

#### 二、基本规格要求

##### II . Student Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有坚实的自然科学基本理论基础和宽广的科学视野；
2. 对全球信息科学和技术的前沿、发展动态及其影响具有足够的理解力和敏感性；
3. 具备大工程观和解决复杂问题的能力；
4. 至少掌握一门外语，具有良好的听说读写能力和跨文化交流能力；
5. 具有批判性思维能力；
6. 逻辑思维清晰；
7. 写作精湛，表达流畅；
8. 富有责任心和诚信，具有良好的团队合作精神；
9. 具有终身学习的能力和激情。

Graduates should acquire the following knowledge and abilities:

1. A solid theoretical foundation of natural sciences and a broad scientific vision;
2. A knowledge of the frontiers, development trends and impacts of global information science and technology;
3. An ability to solve complex engineering problems with a concept of “Big E” engineering;
4. An ability to use at least one foreign language for effective listening, speaking, reading, writing and intercultural communication;
5. An ability to apply critical thinking;
6. An ability to apply logical thinking;
7. Excellent writing skills and fluent expression skills;

8. An understanding of professional and ethical responsibility, and teamwork spirit;
9. A recognition of the need and ability to engage in lifelong learning.

### 三、培养特色

#### III. Program Highlights

以培养工学博士为目标，衔接本科教育阶段。以电子、光电子芯片和器件的设计与制造为核心，以系统应用为方向，构建核心课程群为主体、个性化多元选择课程为辅的课程体系，遵行“群体培养与多元发展相统一、工程实践与科学思维相统一”的人才培养理念，坚持多学科交叉培养、个性化、小班化、国际化、导师制的培养特色，整个本科阶段，导师指导不断线，理论学习不断线，科研实践不断线。

实施“2+1+1+X”的过程培养模式。前二年，按照光电信息大类，推行创新素质教育；第三年，通过专业分流进入自主选择的专业进行学习（光电信息学院的四个专业均可以选择）；第四年，作为本科和研究生衔接阶段，除了按照培养计划要求继续修读本科课程以外，还可以修读部分研究生课程。第五年，可以开始研究生阶段学习。渐进式培养过程中，实行竞争分流和阶段之间有机衔接，本硕连读，并优先推荐免试攻读博士学位。

This program is the undergraduate stage of cultivating engineering doctor. The talent ability training focuses on the design and manufacture of electronic and/or optoelectronic chips and devices, and is oriented by their applications in optical and/or electronic systems. The curriculum is based on the core courses group, supplemented by personalized and diversified courses. Talent training follows the concept of “the unity of group training and diversified development, the unity of engineering practice and scientific thinking”. This program implements a multi-disciplinary, personalized, small-class, international and mentor-led training system. Mentor guidance, theoretical study and scientific research Practice will run through the entire undergraduate stage.

The process culture mode of “2+1+1+X” is adopted. In the first two years, we will implement innovative quality education in accordance with the Optical and electronic information classes. In the third year, students will enter the majors of their own choice through major diversion (all the four majors of the Optical and electronic information classes can be choosed). In the fourth year, as the connecting stage of undergraduate and graduate student, in addition to continuing to study undergraduate courses according to the requirements of the training plan, you can also study some graduate courses. In the fifth year, you can begin your doctoral study. In the process of progressive training, competitive diversion and effective linkage between stages will be implemented. Students will continue to study for undergraduate and master's degrees, and give priority to the test-free recommendation to study for a doctorate.

### 四、主干学科

#### IV. Main Disciplines

光学工程 Optical Engineering

电子科学与技术 Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering



## 六、学时与学分

### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：158.25 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 158.25 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program.

完成学业最低课外学分要求：8 学分。

Minimum Extracurricular Credits : 8 credits.

完成学业选修课程最低学分要求（不含人文社科类选修课程）：20 学分

Minimum Credits for Elective Courses (Non-Electives in Humanities and Social Science) : 20 credits

包括：完成专业选修课程累积不低于 15 学分，其它可以在全校工科专业（含本院各专业）范围内选修。

Including: Specialty-oriented courses offered by Specialty, accumulated no less than 15 credits, the other courses can be taken within the scope of elective courses offered by engineering Specialty (including all of Specialty in our school).

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	588/30	19.0
		选修	160/10	6.3
学科基础课程		必修	1088/63.75	40.3
专业课程	专业核心课程	必修	400/22.5	14.2
	专业选修课程	选修	320/20	12.6
集中性实践教学环节		必修	24W/10	6.3
		选修	4W/2	1.3
合计			2556+28W/158.25	100
其中，总实验（实践）学时及占比			764	25.0

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-Oriented Education General Courses		Required	588/30	19.0
		Elective	160/10	6.3
Discipline-related Courses		Required	1088/63.75	40.3
Specialty Courses	Specialty Core Courses	360/22.5	400/22.5	14.2
	Specialty Elective Courses	320/20	320/20	12.6
Practical Training		Required	24W/10	6.3
		Elective	4W/2	1.3
Total			2556+28W/158.25	100
Practicum Credits			764	25.0

#### 2. 集中性实践教学环节周数与学分

##### Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2W/1	8.3
专业认知实验	必修	1W/0.5	4.2
软件课程设计	必修	2W/1	8.3

续表

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
专业方向课程设计	选修	4W/2	16.7
生产实习	必修	3W/1.5	12.5
毕业设计 (论文)	必修	16W/6	50
合计		28W/12	100

Course Title	Required /Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2W/1	8.3
Experiments for Specialty Cognition	Required	1W/0.5	4.2
Course Project for Software Design	Required	2W/1	8.3
Course Project in Specialty Tracks	Elective	4W/2	16.7
Engineering Internship	Required	3W/1.5	12.5
Undergraduate Thesis	Required	16W/6	50
Total		28W/12	100

## 3. 课外学分

## Extracurricular Credits

序号	名 称	要 求	课外学分
1	思政课社会实践 (必修)	提交调查报告并达标	2
2	社会实践活动	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
3	劳动教育 (必修)	32 学时	2
4	英语及 计算机水平考试	全国大学英语六级考试	获六级证书者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	论文	在全国性及国际期刊或会议发表论文	每篇论文
7	科研创新实践 (必修)	负责并完成至少 1 项科研课题	根据时间和成果, 每项

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。

No.	Activities	Requirements	Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score	2
2	Community Engagement	Submitting a report and passing the oral defense	2
		Individuals awarded "Active Participant" / Teams awarded "Excellent Performance" by HUST or Hubei Youth League Committee	2

continue

No.	Activities	Requirements		Extracurricular Credits
3	Labor education	Practical Service	Pass	2
4	Examinations in English and Computer	CET-6	Win certificate of Band-6 or higher	2
		National Computer Rank Examination	Certificate (Grade 1 / 2)	2
		Qualifications for Computer and Software Technology Proficiency	Programmer	2
			Senior Programmer	3
			System Analyst	4
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic Papers	Publication of papers in national or international journals or conference	Each paper	2-3
7	Scientific Research and Innovation Practice	Responsible for and complete at least 1 scientific research project	Based on time and results, Each item	2-5

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）专业主要课程 Main Courses in Specialty

四个专业共同的专业主干课程包括：

The main courses of the four majors in common include.

单片机原理及应用 Principle and Application of Single Chip Microcomputer、信号与线性系统 Signals and Linear Systems、数字逻辑与系统设计基础 Fundamentals of Digital Logic and System Design、量子力学 Quantum Mechanics、热力学与统计物理 Thermodynamics and Statistical Physics

四个专业各自的专业主干课程包括：

The main courses of each of the four majors include.

光电信息科学与工程专业（Specialty In Optoelectronic Information Science and Engineering）：

应用光学 Applied Optics、物理光学 Physical Optics、激光原理与技术 Laser Theory and Technology、光电探测与信号处理 Optoelectronic Detection & Signal Processing、光纤光学 Fiber Optics

电子科学与技术专业（Specialty in Electronic Science and Technology）：

固体物理 Solid State Physics、半导体物理 Semiconductor Physics、电子器件工艺原理 Process Principle of Electronic Device、Computational Material Science and Fundamental of Material Design、电子器件基础 Fundamentals of Electronic devices、半导体器件物理 Physics of Semiconductor Devices

集成电路设计与集成系统专业（Specialty in IC Design and Integrated System）：

计算机组成原理 Principles of Computer Organization、嵌入式系统原理与设计 Principles and

Design of Embedded System、半导体器件物理 Physics of Semiconductor Devices、数字集成电路基础 Fundamentals of Digital Integrated Circuit、CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit

微电子科学与工程专业 (Specialty in Microelectronic Science and Engineering) :

固体物理 Solid State Physics、半导体物理 Semiconductor Physics、微电子材料 Microelectronic Materials、微电子器件与 IC 设计 Microelectronic Devices and IC design、微电子工艺学 Microelectronic Process、CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit、微电子封装与测试 Microelectronic Packaging and Testing.

(二) 创新 (创业) 课程 Innovation (Entrepreneurship) Courses

创新意识启迪课程 Innovative Awareness Enlightenment Course :

科学思维与研究方法 Method of Scientific Thinking and Research、专业认知实验 Experiments for Specialty Cognition、科技阅读与写作 Academic Reading and Writing、人工智能导论 Introduction to Artificial Intelligence

创新能力培养课程 Innovative Ability Training Course :

光纤通信技术 (一) Optical Fiber Communication Technology (I)、电子材料物理 Physics of Electronic Material、高级模拟集成电路设计 Advanced Analog Integrated Circuit Design、类脑计算与器件 Brain-inspired Computing and Devices、算法设计与分析 Algorithm Design and Analysis

创新实践训练课程 Innovative Practice Training Course :

嵌入式系统创新实践 Innovation Practice for Embedded system、微电子工艺创新实践 (二) Innovation Practice for Microelectronic Fabrication (II)、软件课程设计 Course Project for Software Design

## 八、主要实践教学环节 (含专业实验)

### VIII. Practicum Module (experiments included)

软件课程设计 Course Project for Software Design、专业方向课程设计 Course Project in Specialty Tracks、专业实验 Specialized Experiments、专业认知实验 Experiments for Specialty Cognition、科研创新实践 Scientific Research and Innovation Practice、生产实习 Engineering Internship、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

### IX. Course Schedule

院 (系) : 光学与电子信息学院

专业: 光电信息类

School (Department): School of Optical and Electronic Information

Major: Optical and electronic information classes

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质 教育 通识 课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-Oriented Education General Courses	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0003	综合英语（一） Comprehensive English ( I )	48	3			1
	必修 Required	SFL0013	综合英语（二） Comprehensive English ( II )	48	3			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
	必修 Required	QMX0011	科学思维与研究方法 Scientific Thoughts and Research Methods	16	1			1
			从不同的课程模块中修读若干课程，美育类课程、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses(elective)	160	10			2-8
学科基础课程 Discipline-Related Courses	必修 Required	MAT0552	微积分（A）上 Calculus ( I )	96	6			1
	必修 Required	MAT0532	微积分（A）下 Calculus ( II )	96	6			2
	必修 Required	MAT0722	线性代数（A） Linear Algebra	48	3			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0592	概率论与数理统计（A） Probability and Mathematics Statistics	48	3			2
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics Special Functions	40	2.5			3
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1	32		2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	PHY0561	物理实验（二） Physical Experiments (II)	24	0.75	24		3
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	OEI0591	科技阅读与写作 Academic Reading and Writing	16	1			2
	必修 Required	EEE0721	电路理论（五） Circuit Theory (V)	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		3
	必修 Required	EIC0811	数字逻辑与系统设计基础 Fundamental of Digital Logic and System Design	88	4.5	32		4
	必修 Required	EIC0591	模拟电子技术（二） Analogue Electronics (II)	56	3.5			3
	必修 Required	EIC0801	模拟电子技术实验 Analogue Electronics Electronic Experiment	32	1	32		3
	必修 Required	OEI0581	信号与线性系统 Signal and Linear System	56	3.5		4	3
	必修 Required	OEI0511	单片机原理及应用 Principle and Application of Single Chip Microcomputer	48	3			4
	必修 Required	OEI0571	微机实验 Microcomputer Experiments	16	0.5	16		4
	必修 Required	OEI0521	量子力学（二） Quantum Mechanics (II)	48	3			4
	必修 Required	OEI0532	热力学与统计物理 Thermodynamics and Statistical Physics	32	2			4
			专业方向必修模块（四选一） Specialty-oriented Module (Choose One out of Four)					
专业核心课程 Specialty Required Courses			光电信息科学与工程专业					
	必修 Required	OEI2321	应用光学 Applied Optics	48	3			5
	必修 Required	OEI2331	应用光学实验 Applied Optics Experiments	16	0.5	16		5
	必修 Required	OEI2061	电动力学 Electrodynamics	48	3			5
	必修 Required	OEI2291	物理光学 Physical Optics	72	4.5			5
	必修 Required	OEI2301	物理光学实验 Physical Optics Experiments	16	0.5	16		5
	必修 Required	OEI2161	光电探测与信号处理 Optoelectronic Detection and Signal Processing	48	3			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	OEI2121	光电技术实验 Optoelectronic Technology Experiments	16	0.5	16		5
	必修 Required	OEI2151	激光原理与技术 Laser Theory and Technology	64	4			6
	必修 Required	OEI2191	激光实验 Lasers Experiments	16	0.5	16		6
	必修 Required	OEI2171	光纤光学 Fiber Optics	40	2.5			6
	必修 Required	OEI2181	光纤光学实验 Fiber Optics Experiments	16	0.5	16		6
			电子科学与技术专业					
	必修 Required	OEI2111	固体物理 Solid State Physics	48	3			5
	必修 Required	OEI2041	半导体物理（一） Semiconductor Physics（I）	48	3			5
	必修 Required	OEI2051	电磁场与电磁波 Electromagnetic Field and Wave	48	3			5
	必修 Required	OEI2021	半导体器件物理 Physics of Semiconductor Devices	40	2.5			5
	必修 Required	OEI2211	计算材料科学与材料设计 Computational Material Science and Fundamental of Material Design	32	2			6
	必修 Required	OEI2101	电子器件基础 Fundamentals of Electronic devices	40	2.5			6
	必修 Required	OEI2091	电子器件工艺原理 Process Principle of Electronic Device	40	2.5			6
	必修 Required	OEI2081	电子科学与技术专业基础实验 Specialized Fundamental Experiments of Electronic Science and Technology	48	1.5	48		6
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			5
			集成电路设计与集成系统专业					
	必修 Required	OEI2031	半导体物理（二） Semiconductor Physics（II）	40	2.5			5
	必修 Required	OEI2021	半导体器件物理 Physics of Semiconductor Devices	40	2.5			5
	必修 Required	OEI2241	数字集成电路基础（一） Fundamentals of Digital Integrated Circuit（I）	56	3.5			5
	必修 Required	OEI2201	集成电路专业基础实验 Specialized Fundamental Experiments of IC	48	1.5	48		5
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	OEI2221	计算机组成原理 Principles of Computer Organization	56	3.5			5
	必修 Required	OEI2231	嵌入式系统原理与设计 Principles and Design of Embedded System	40	2.5			6
	必修 Required	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6
	必修 Required	OEI3861	嵌入式系统创新实践（二） Innovation Practice for Embedded System（II）	3w	1.5			7
			微电子科学与工程专业					
	必修 Required	OEI2111	固体物理 Solid State Physics	48	3			5
	必修 Required	OEI2041	半导体物理（一） Semiconductor Physics	48	3			5
	必修 Required	OEI2271	微电子器件与 IC 设计（一） Microelectronic Devices and IC Design（I）	56	3.5			5
	必修 Required	OEI2341	CMOS 模拟集成电路基础 Fundamentals of CMOS Analog Integrated Circuit	40	2.5			5
	必修 Required	OEI2131	微电子材料 Microelectronic Materials	40	2.5			6
	必修 Required	OEI2141	微电子工艺学 Microelectronic Process	40	2.5			6
	必修 Required	OEI2261	微电子封装与测试 Microelectronic Packaging and Testing	40	2.5			6
	必修 Required	OEI2282	微电子学专业基础实验 Specialized Fundamental Experiments of Microelectronics	48	1.5	48		5
	必修 Required	OEI3851	微电子工艺创新实践（二） Innovation Practice for Microelectronic Fabrication（II）	3w	1.5			6
专业选修课程 Specialty-oriented Courses			专业选修课程最低学分要求：15 学分 Minimum Credits for Elective Courses：15 credits					
	选修 Elective	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	选修 Elective	OEI5801	人工智能导论 Introduction to Artificial Intelligence	32	2			3
	选修 Elective	OEI2311	现代化学基础（二） Fundamental of Modern Chemistry（II）	32	2			3
	选修 Elective	ENS0511	算法设计与分析 Algorithm Design and Analysis	40	2.5			4
	选修 Elective	OEI5721	类脑计算与器件 Brain-inspired Computing and Devices	32	2			5
	选修 Elective	OEI5561	通信原理（一） Principles of Communication（I）	48	3			7



续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5051	半导体光电子学 Semiconductor Optoelectronics	48	3			6
	选修 Elective	OEI2071	电子材料物理 Physics of Electronic Material	48	3			7
	选修 Elective	OEI5391	光纤通信技术（一） Optical Fiber Communication Technology ( I )	48	3			8
	选修 Elective	OEI5621	微纳光电器件 Micro-nano Optoelectronic Devices	40	2.5			8
	选修 Elective	OEI5361	光网络技术 Optical Network Technology	40	2.5			6
	选修 Elective	OEI5341	光电仪器学 Optoelectronic Instrumentation	40	2.5			6
	选修 Elective	OEI5731	超快激光微纳制造原理与技术 Principle of Ultrafast Laser Micro-nano Manufacturing and Technology	32	2			8
	选修 Elective	OEI5811	智能计算系统 AI Computing System	32	2			8
	选修 Elective	OEI5791	射频集成电路基础 Fundamentals of Radio Frequency IC	40	2.5			6
	选修 Elective	OEI5741	光电信息功能材料 Optoelectronic Information Functional Materials	32	2			6
	选修 Elective	OEI5121	电子显微分析 Electron Microscopic Analysis	40	2.5	4		7
	选修 Elective	OEI5291	射频/微波技术基础 Basis of RF/Microwave Technique	32	2			5
	选修 Elective	OEI5161	高等化学 Advanced Chemistry	40	2.5			7
	选修 Elective	OEI5281	微波器件原理与设计 The Principle and Design of Microwave Device	32	2			6
	选修 Elective	OEI5081	传感器原理与设计基础 Principle and Design Fundamental of Sensors	32	2			6
	选修 Elective	OEI5071	处理器体系结构 Processor Architecture	40	2.5			8
	选修 Elective	OEI2251	数字集成电路基础（二） Fundamentals of Digital Integrated Circuit (II)	40	2.5			6
	选修 Elective	OEI5761	高级模拟集成电路设计 Advanced Analog Integrated Circuit Design	40	2.5			8
	选修 Elective	OEI5021	MEMS 系统与应用 MEMS System and Application	32	2			6
	选修 Elective	OEI5531	数字信号处理 Digital Signal Processing	32	2			6
	选修 Elective	OEI5191	功率集成电路 Power Integrated Circuits	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	OEI5101	电子材料与器件测试技术 Measurement Techniques for Electronic Material and Device	32	2			6
	选修 Elective	OEI5311	微电子器件可靠性技术基础 Fundamental of Microelectronics Device Reliability Technology	32	2			6
	选修 Elective	OEI5111	电子封装与表面组装技术 Electronic Packaging and Surface Assembling	32	2			7
	选修 Elective	OEI5671	信息存储技术基础 Information Storage Technology	32	2			6
	选修 Elective	OEI5541	太阳能电池 Basic Principles of Solar Cell	32	2			6
	选修 Elective	OEI5271	量子信息学导论 Introduction of Quantum Informatics	32	2			7
	选修 Elective	OEI5061	半导体激光器 Semiconductor Laser	32	2			7
	选修 Elective	OEI5321	光电探测器 Photoelectric Detection Devices	32	2			7
	选修 Elective	OEI5481	纳电子器件 Nanoelectronic Devices	40	2.5			8
	选修 Elective	OEI5261	生物芯片技术 Biochip Technology	32	2			7
	选修 Elective	OEI5711	自旋电子学器件 Spintronics	32	2			7
	选修 Elective	OEI5491	纳米材料与器件 Nano Materials and Devices	32	2			7
实践环节 Practical Training Items			课程设计（选修）中任选 2 门，与所选专业方向匹配 Two course project is selected from elective course projects to match the corresponding Specialty-oriented					
	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	OEI3711	生产实习 Engineering Internship	3w	1.5			6
	必修 Required	OEI3771	专业认知实验 Experiments for Specialty Cognition	1w	0.5			1
	必修 Required	OEI3701	软件课程设计 Course Project for Software Design	2w	1			1
	选修 Elective	OEI3611	光学课程设计 Optical Design Course Project	2w	1			5
	选修 Elective	OEI3621	激光科学与工程专业方向课程设计 Course Project in Laser Science & Engineering	2w	1			6
	选修 Elective	OEI3591	光电子器件与集成专业方向课程设计 Course Project in Optoelectronic Devices and Integration	2w	1			6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学 时 hrs	学 分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	选修 Elective	OEI3601	光通信与光网络技术专业方向课程设计 Course Project in Optical Communication & Optical Network Technology	2w	1			6
	选修 Elective	OEI3571	光电系统与信息处理专业方向课程设计 Course Project in Optoelectronic System & Information Processing	2w	1			6
	选修 Elective	OEI3521	电子器件制备工艺课程设计 Course Project for Fabrication Process of Electronic Device	2w	1			6
	选修 Elective	OEI3741	微电子工艺课程设计 Course Project for Microelectronic Fabrication	2w	1			6
	选修 Elective	OEI3721	数字集成电路课程设计 Course Project for Digital IC Design	2w	1			5
	选修 Elective	OEI3671	模拟集成电路课程设计 Course Project for Analog IC Design	2w	1			6
	选修 Elective	OEI3751	微电子器件建模课程设计 Course Project for Modeling of Microelectronic Devices	2w	1			5
	选修 Elective	OEI3631	集成电路课程设计 Course Project for Integrated Circuit Design	2w	1			5
	选修 Elective	OEI3641	计算材料学课程设计 Course Project for Computational Material Science	2w	1			6
	选修 Elective	OEI3681	能源光电子器件制备工艺课程设计 Course Project for Fabrication Process of Energy Photoelectron Device	2w	1			6
	选修 Elective	OEI3731	微波器件与微波电路设计课程设计 Course Project for Microwave Devices and Microwave Circuit Design	2w	1			6
	必修 Required	OEI3511	毕业设计(论文) Undergraduate Thesis	16w	6			7-8

## 人工智能与自动化学院

为抢抓新一代人工智能发展的重大战略机遇，华中科技大学以原自动化学院为基础，于 2019 年 1 月 26 日成立了人工智能与自动化学院、人工智能研究院。学院在国内控制学科、系统工程学科、模式识别与智能系统学科、检测技术与自动化装置学科都享有较高声誉。

近十年来，学院承担并完成的国家和企业科研项目 1300 余项，科研经费不断攀高；先后获国家科技进步奖等国家级奖励 20 余项，省部级奖励 20 余项，国家发明专利数十项。2007 年，控制科学与工程一级学科被教育部认定为国家一级重点学科。控制科学与工程学科在教育部 2016 年第四轮学科评估中评为 A- 学科。2018 自动化专业被评为“双一流”专业。学院拥有“多谱信息处理技术”国家级重点实验室、“图像信息处理与智能控制”教育部重点实验室、及“国家国民经济动员仿真演练研究中心”等科研平台。

学院现有 3 个本科专业（自动化、人工智能、智能医学工程），开设了人工智能创新实验班、人工智能本硕博实验班、自动化卓越工程师计划实验班 3 个实验班；5 个工学硕士点、博士点（控制理论与控制工程、检测技术与自动化装置、系统工程、模式识别与智能系统、导航、制导与控制）；控制科学与工程博士后流动站。已形成本科、硕士、博士、博士后完整的人才培养体系。目前在校本科生 1300 余人、全日制硕士研究生 750 余人、全日制博士研究生 250 余人。

## 人工智能专业本科培养计划

### Undergraduate Program for Specialty in Artificial Intelligence

#### 一、培养目标

##### I. Educational Objectives

本专业培养具有良好的思想品德和文化修养、专业理论基础宽厚扎实、富于现代科学创新意识和系统思维能力，在人工智能及交叉领域从事基础研究、应用研究与组织管理的高素质复合型人才。使其掌握人工智能理论和基本方法，具有丰富的实践、动手能力，能够利用人工智能知识分析并解决实际问题，熟悉人工智能相关交叉学科知识，具备开拓人工智能新边界的创新思维，兼具国际视野和社会责任，在人工智能科学基础、系统应用和交叉融合方面具有特色。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of Artificial Intelligence.

#### 二、毕业要求

##### II. Learning Outcomes

学生掌握电子、计算机、通信和控制等多学科交叉知识，能够根据视觉、语音、大规模数据库之类的复杂输入进行智能感知、决策和控制，以增强人类的处理能力。毕业生应具备以下素质、知识和能力：

1. 工程知识：具备数学、自然科学、工程基础和自动化专业知识，并能用于解决人工智能领域的复杂工程问题；
2. 问题分析：能够应用数学、自然科学、工程科学的基本原理，表达、并通过文献研究分析复杂工程问题；设计和实施实验及分析和解释数据；
3. 设计/开发解决方案：能设计针对人工智能复杂工程问题的解决方案，设计智能系统，设备或工艺，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；
4. 研究：能够基于科学原理并采用科学方法，通过实验设计、建模仿真、数据分析与解释、验证与改进对人工智能领域的复杂工程问题进行研究并得到合理有效的结论；
5. 使用现代工具：能针对人工智能领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对人工智能领域复杂问题的预测与模拟，并能理解局限性；
6. 工程与社会：能够基于工程领域相关背景知识进行合理分析，评价人工智能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，并理解和承担工程师的社会责任；
7. 环境和可持续发展：能够理解和评价针对人工智能领域复杂工程问题的专业工程实践环境、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、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：具有团队意识和能力，能够在多学科背景下的团队中协同工作，并能承担个体、团队成员及负责人的角色；
10. 沟通：能够就人工智能领域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、陈述发言、清晰表达或回答指令，并具备一定的国际视野，能够在跨文化背景下沟通和交流；

11. 项目管理：理解并掌握工程管理原理和经济决策方法，熟悉人工智能领域项目管理的基本方法和技术，并能在多学科环境中应用；

12. 终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应技术新发展的能力。

Students master the interdisciplinary knowledge of electronics, computer, communication and control. It can intelligently perceive, make decisions and control according to the complex input of vision, voice and large-scale database, so as to enhance the processing ability of human beings. students are expected to gain:

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern tool usage: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex engineering problems in the AI field, including the prediction and modeling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practices.

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

1. 以模式识别与机器学习、视觉智能系统为基础；
2. “启于视，谋于智，精于算，践于芯，软硬兼施，知行合一”

1. This program is based on Computer Vision, Pattern recognition and Machine Learning;

2. This program is started with vision, intelligence, algorithm, implemented on the chip, combination of AI and control, software and hardware, the unity of knowing and doing.

### 四、主干学科

#### IV. Major Disciplines

人工智能 Artificial Intelligence

### 五、学制与学位

#### V. Length of Schooling and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.8 学分

**Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 162.8 credits**

完成学业最低课外学分要求：5 学分

Minimum Extracurricular Credits: 5 credits

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	580/31	19
		选修	160/10	5
学科基础课程		必修	880/50.3	28
专业课程	专业核心课程	必修	432/25	14
	专业选修课程	专业主选	288/17	10
		专业任选	184/11.5	6
集中性实践教育环节		必修	36w/18	18
合计			2524+36w/162.8	100
其中，总实验（实践）学时学分			380+36w/956/3100	30.84

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	580/33	19
		Elective	160/10	5
Basic Courses in Discipline		Required	880/50.3	28
Courses in Specialty	Core Courses in Specialty	Required	432/25	14
	Elective Courses in Specialty	Elective	288/17	10
	Elective Courses in Specialty	Elective	184/11.5	6
Practical Training		Required	36w/18	18
Total			2524+36w/162.8	100
Practicum Credits			380+36w	30.84

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5.6
工程训练 (3) (7)	必修	4/2	11.2
C 语言程序设计课程设计	必修	3/1.5	8.3
生产实习 (社会实践)	必修	2/1	5.6
图像处理与计算机视觉课程设计	必修	3/1.5	8.3
模式识别与机器学习课程设计	必修	3/1.5	8.3
自主智能系统课程设计	必修	3/1.5	8.3
毕业设计 (论文)	必修	16/8	44.4
合计		36/18	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.6
Engineering Training	Required	4/2	11.2
C Programming Course Project	Required	3/1.5	8.3
Engineering Internship (Social Practice)	Required	2/1	5.6
Course Project of Image Processing & Computer Vision	Required	3/1.5	8.3
Course Project of Pattern recognition & Machine Learning	Required	3/1.5	8.3
Course Project of Autonomous Intelligent System	Required	3/1.5	8.3
Undergraduate Thesis	Required	16/8	44.4
Total		36/18	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3	劳动教育 (必修)	完成劳动教育类课程满 32 学时		2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3



续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
6	国际交流	参与专业学科相关的海外知名高校学术夏令营、暑期学校等 2 周以上，获得结业证书		1
		参加国内外举办的国际学术会议，有海报展示或做会议报告		1-2
7	论文	在国内外正式期刊上发表论文	每篇论文	2-3
8	专利	和专业相关并正式获得专利公开号	每项前两名	2-3
9	学术活动	参加学术讲座，上交学术讲座记录表，并选取其中感兴趣的一次讲座书写成书面报告，通过学院认证者		1
10 *	科研	在科研课题组参加科研实践，通过答辩，提交课题研究报告	每项（视参与科研项目、创新实践项目时间、科研能力、科研成果）	1
		完成院级大学生创新创业训练项目		1
		完成校级大学生创新创业训练项目		2
		完成省级、国家级大学生创新创业训练项目		3

注：1. 参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

2. 标注 \* 的项目为必须完成的项目

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2 *	Ideological and political course Social Practice	Submitting a report and obtain a passing score		2
3 *	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	325 Points or Higher	3
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
5	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win Third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
6	International Exchange	Taking part in Academic Summer camp or Summer School in famous overseas universities related to discipline for 2 weeks or more, and getting the graduation certificate;		1
		Taking part in international academic conference held at home and abroad, with poster display or make conference report.		1
7	Academic Paper	Published in national-level journals	Each paper	2-3
8	Patent	Officially obtained patent publication number	Each program	2-3
9	Academic Activities	Participate in the Learned Lecture organized by school, submit lecture records and submit report for one lecture; obtain proof of school		1
10 •	Scientific Research	Participated in scientific research practice and passed the defense	Each item (Depending on both the time spent in and ability demonstrated in scientific research project)	1
		Innovation and entrepreneurship training program of school		1
		Innovation and entrepreneurship training program of university/province		2
		Innovation and entrepreneurship training program of nation		3

Note : 1. In HUST Sports Meeting, the first and the second prize, the third to the fifth prize and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

2. “•” shows that the item and requirements must be completed by every student.

## 七、主要课程及创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses in Specialty

电路理论 Circuit Theory、电子技术 Electronic Technology、模拟电子技术 Analog Electronics、数字电路与逻辑设计 Digital Circuit and Logic Design、计算机组成与嵌入式系统 Computer Organization and Embedded Systems、自动控制原理 Control Theory、数据结构与算法分析 Data Structure and Algorithmic Analysis、人工智能导论 Foundation of Artificial Intelligence、机器学习 Machine Learning、模式识别 Pattern Recognition、计算机视觉 Computer Vision 等

#### 2. 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程：专业概论（智能中国）、人工智能导论

Orientation Innovation (Entrepreneurship) Courses: Introduction to Specialty、Foundation of AI.

创新能力培养类课程：计算机组成与嵌入式系统、模式识别、计算机视觉、自主智能系统

Capacity-building Innovation (Entrepreneurship) Courses: Computer Organization and Embedded Systems、Pattern Recognition、Computer Vision、Swarm Intelligence.

创新实践训练类课程：模式识别与机器学习课程设计、图像处理与计算机视觉课程设计、自主智能系统课程设计

Innovative Practice Training Courses: Course Projects of Autonomous Intelligent System, Course Projects of Pattern Recognition & Machine, Course Projects of Image Processing & Computer Vision.

## 八、主要实践教学环节（含专业实验）

### VIII. Main Internship and Practical Training (Including experiments)

军事训练 Military Training、生产实习 Engineering Internship、课程设计 Course Project、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

## IX. Table of Teaching Schedule

院（系）：人工智能与自动化学院

专业：人工智能

School (Department) : School of Artificial Intelligence and Automation

Major: Artificial Intelligence

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Current Affairs and Policy	48	1.5			5-7
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Fundamental English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Fundamental English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0551	微积分（一）上 Calculus ( I ) (A)	88	5.5			1
	必修 Required	MAT0531	微积分（一）下 Calculus ( I ) (B)	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	AUT0553	离散数学 Discrete Mathematics	32	2			3
	必修 Required	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments ( II )	24	0.8	24		3
	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language ( C )	56	3.5		20	1
	必修 Required	EEE0641	电路理论（三） Circuit Theory ( III )	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		2
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			3
	必修 Required	ELC0591	模拟电子技术（二） Analog Electronics ( II )	56	3.5			3
	必修 Required	EIC0551	电子线路设计、测试与实验（一） Electronic Circuitry Design Test and Experiments ( I )	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试与实验（二） Electronic Circuitry Design Test and Experiments ( II )	32	1	32		4
专业核心课程 Core courses in Specialty	必修 Required	AUT2252	最优化理论与方法 Optimization Theory and Method	48	3			3
	必修 Required	AUT2291	数据结构与算法分析 Data Structure and Algorithmic Analysis	64	3.5	16		3
	必修 Required	AUT2242	人工智能导论 Foundation of Artificial Intelligence	40	2.25	8		4
	必修 Required	AUT5951	数据科学基础 Foundation of Data Science	32	2			4
	必修 Required	AUT6281	计算机组成与嵌入式系统 Computer Organization and Embedded Systems	64	3.5	16		4
	必修 Required	AUT2101	自动控制原理（一） Control Theory ( I )	56	3.5			4
	必修 Required	AUT0011	模式识别 Pattern Recognition	48	2.75	8		4 ( 上 )

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
	必修 Required	AUT0021	机器学习 Machine Learning	40	2.25	8		4 (下)
	必修 Required	AUT0031	计算机视觉 Computer Vision	40	2.25	8		6
专业选修课程 Elective courses in Specialty			专业限选课程 Selected Electives in Specialty	288	17			
	选修 Elective	AUT5642	数字图像处理 Digital Image Processing	40	2.25	8		5
	选修 Elective	AUT5663	数字信号处理 Digital Signal Processing	40	2.25	8		5
	选修 Elective	AUT2232	自动控制原理 (二) Control Theory (II)	40	2.5			5
	选修 Elective	AUT5381	计算机网络 Computer Network	40	2.5	8		5
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2			5 (前)
	选修 Elective	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
	选修 Elective	AUT6083	脑与认知科学导论 Introduction to Brain and Cognition Science	32	1.75	8		6
	选修 Elective	AUT6232	智能芯片设计 Design of Intelligent Chip	32	1.75	8		6
	选修 Elective	AUT6251	自主智能系统 Swarm Intelligence	32	2			6
			专业选修课程 Electives in Specialty	184	11.5			
	选修 Elective	AUT6321	专业概论 (智能中国) Introduction to Specialty	32	2			1
	选修 Elective	AUT6161	文献检索与科技论文写作 Document Retrieval & Scientific Paper Writing	16	1			2
	选修 Elective	AUT6001	Python 程序设计 Python Programming	40	2.5		16	5
	选修 Elective	AUT5451	面向对象的程序设计 Object Orient Program Design	40	2.5		8	5
	选修 Elective	AUT5031	Java 程序设计 Java Programming	40	2.5		16	5
	选修 Elective	AUT5621	数据库技术 Database Technology	32	2			5
	选修 Required	AUT5211	复杂性科学基础 Foundation of Complexity Sciences	32	2			5
	选修 Elective	AUT5311	互联网技术及应用 Internet Technology and Application	32	2		8	5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT0041	项目管理 Project Management	32	2			5
	选修 Elective	AUT5792	系统建模 System Modeling	32	2			5
	选修 Elective	AUT5521	软件工程 Software Engineering	24	1.5		8	5
	选修 Elective	AUT5771	系统仿真与 Matlab Matlab System Simulation and Matlab	32	2	4		5
	选修 Elective	AUT5251	管理信息系统 Management Information System	32	2			5
	选修 Elective	AUT2072	计算机控制技术 Computer Control Technology	24	1.5			5
	选修 Elective	AUT2271	传感技术 Sensor Technology	40	2.5	8		5
	选修 Elective	AUT2061	工程光学 Engineering Optics	48	3	8		5
	选修 Elective	AUT6021	工程伦理（案例讲座） Engineering Ethic	32	2			6
	选修 Elective	AUT5051	博弈论 Game Theory	32	2			6
	选修 Elective	AUT0531	计算方法（二） Computational Method（II）	32	2			6
	选修 Elective	AUT6011	并行计算 Parallel Computing	32	2			6
	选修 Elective	AUT6121	神经网络 Neural Network	32	2			6
	选修 Elective	AUT5691	图像理解与分析 Image Understanding and Analysis	32	2			6
	选修 Elective	AUT6311	工业人工智能技术及应用 Technology and Application of Industrial Artificial Intelligence	32	2		8	6
	选修 Elective	AUT5181	动画与游戏设计 Animation and Game Design	32	2			6
	选修 Elective	AUT5121	单片机原理 Principle of Single Chip Microcomputer	32	2	8		6
	选修 Elective	AUT5881	智能控制 Intelligent Control	32	2			6
	选修 Elective	AUT6171	虚拟现实技术（网易） Virtual Reality Technology	32	2			6
	选修 Elective	AUT5871	智能计算（一） Intelligent Computing（I）	32	2			7
	选修 Elective	AUT6191	智能机器人 Intelligent Robotics	24	1.5	8		7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty Elective courses in	选修 Elective	AUT5721	网络安全 Network Security	32	2			7
	选修 Elective	AUT5131	导弹概论 Introduction Missile	16	1			7
	选修 Elective	AUT6241	自然语言处理 Natural Language Processing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练 (3) Engineering Training (III)	2w	1			1
	必修 Required	ENG3551	工程训练 (7) Engineering Training (VII)	2w	1			3
	必修 Required	AUT3511	C 语言程序设计课程设计 Course Project for C Programming	3w	1.5			2
	必修 Required	AUT3751	模式识别与机器学习课程设计 Course Project of Pattern Recognition & Machine Learning	3w	1.5			5
	必修 Required	AUT3761	图像处理与计算机视觉课程设计 Course Project of Image Processing & Computer Vision	3w	1.5			7
	必修 Required	AUT3741	自主智能系统课程设计 Course Project of Autonomous Intelligent System	3w	1.5			7
	必修 Required	AUT3621	生产实习 Engineering Internship	2w	1			6
	必修 Required	AUT3521	毕业设计 (论文) Undergraduate Thesis	16w	8			8

## 人工智能第二主修专业培养计划

### Undergraduate Program for the Second Specialty in Artificial Intelligence

#### 一、培养目标

##### I . Educational Objectives

培养具有良好的思想品德和文化修养、专业理论基础宽厚扎实、富于现代科学创新意识，在人工智能领域从事理论研究、科技开发与组织管理的高素质复合型人才。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of Artificial Intelligence.

#### 二、学位

##### II . Degree Conferred

工学学士

Bachelor of Engineering

#### 三、学分

##### III . Credits

完成学业最低学分要求：50 学分

Minimum Course Credits : 50 credits

其中：

Including：

专业核心课程：24.5 学分

Core Courses in Specialty : 24.5 credits

专业选修课程：13 学分

Elective courses in Specialty : 13 credits

实践环节：12.5 学分

Undergraduate Thesis : 12.5 Credits.

#### 四、教学进程计划表

##### IV . Table of Teaching Schedule

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
Core courses in Specialty	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language (C)	56	3.5		20	1
	必修 Required	AUT2291	数据结构与算法分析 Data Structure and Algorithmic Analysis	64	4	16		3
	必修 Required	AUT2251	最优化理论与方法 Optimization Theory and Method	32	2			3



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Core courses in Specialty	必修 Required	AUT5951	数据科学基础 Foundation of Data Science	32	2			4
	必修 Required	AUT2242	人工智能导论 Foundation of Artificial Intelligence	40	2.25	8		4
	必修 Required	AUT6281	计算机组成与嵌入式系统 Computer Organization and Embedded Systems	64	3.5	16		4
	必修 Required	AUT0011	模式识别 Pattern Recognition	48	2.75	8		4
	选修 Elective	AUT0021	机器学习 Machine Learning	40	2.25	8		4
	必修 Required	AUT5351	计算机视觉 Computer Vision	40	2.25	8		6
专业基础课程 Basic Courses in Discipline	选修 Elective	AUT5381	计算机网络 Computer Network	40	2.5	8		5
	选修 Elective	AUT5642	数字图像处理 Digital Image Processing	40	2.25	8		5
	选修 Elective	AUT5663	数字信号处理 Digital Signal Processing	40	2.25	8		5
	选修 Elective	AUT5792	系统建模 System Modeling	32	2			5
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2			5 (前)
	选修 Elective	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
	选修 Elective	AUT6083	脑与认知科学导论 Introduction to Brain and Cognition Science	32	1.75	8		6
	选修 Elective	AUT6101	群体智能 Swarm Intelligence	24	1.5			6
	选修 Elective	AUT6232	智能芯片设计 Design of Intelligent Chip	32	1.75	8		6
	选修 Elective	AUT6251	自主智能系统 Swarm Intelligence	32	2			6
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2	8		6
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2	8		6
实践环节 Internship and Practical Training	必修 Required	AUT3761	图像处理与计算机视觉课程设计 Course Project of Image Processing & Computer Vision	3w	1.5			6
	必修 Required	AUT3751	模式识别与机器学习课程设计 Course Project of Pattern Recognition & Machine Learning	3w	1.5			6
	必修 Required	AUT3741	自主智能系统课程设计 Course Project of Autonomous Intelligent System	3w	1.5			7
	必修 Required	AUT3521	毕业设计 (论文) Undergraduate Thesis	16w	8			8

## 人工智能辅修专业培养计划

### Undergraduate Program for Auxiliary Specialty in Artificial Intelligence

#### 一、培养目标

##### I. Educational Objectives

培养具有良好的思想品德和文化修养、专业理论基础宽厚扎实、富于现代科学创新意识，在控制科学与工程领域从事理论研究、科技开发与组织管理的高素质复合型人才。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of Artificial Intelligence.

#### 二、学分

##### II. Credits

完成学业最低学分要求：25 学分

Minimum Course Credits : 25 credits

其中：

Including：

专业核心课程：18 学分

Basic Courses in Discipline : 18 credits

专业选修课程：7 学分

Elective courses in Specialty : 7 credits

#### 三、教学进程计划表

##### III. Table of Teaching Schedule

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
学科 基础 课程 Basic Courses in Discipline	必修 Required	AUT2291	数据结构与算法分析 Data Structure and Algorithmic Analysis	64	3.5	16		3
	必修 Required	AUT2251	最优化理论与方法 Optimization Theory and Method	32	2			3
	必修 Required	AUT2241	人工智能导论 Foundation of Artificial Intelligence	40	2.25	8		4
	必修 Required	AUT5951	数据科学基础 Foundation of Data Science	32	2			4
	必修 Required	AUT6281	计算机组成与嵌入式系统 Computer Organization and Embedded Systems	64	3.5	16		4
	必修 Required	AUT5551	模式识别 Pattern Recognition	48	2.75	8		4
	必修 Required	AUT5351	计算机视觉 Computer Vision	40	2	8		6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Basic Courses in Specialty			专业选修课程 Electives in Specialty	160	10			
	选修 Elective	AUT6061	机器学习 Machine Learning	32	2			4
	选修 Elective	AUT5641	数字图像处理 Digital Image Processing	32	2			5
	选修 Elective	AUT5662	数字信号处理 Digital Signal Processing	32	2			5
	选修 Elective	AUT5792	系统建模 System Modeling	32	2			5
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2	8		5
	选修 Elective	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
	选修 Elective	AUT6082	脑与认知科学导论 Introduction to Brain and Cognition Science	32	2	8		6
	选修 Elective	AUT6101	群体智能 Swarm Intelligence	24	1.5			6
	选修 Elective	AUT6231	智能芯片设计 Design of Intelligent Chip	32	2			6
	选修 Elective	AUT6251	自主智能系统 Swarm Intelligence	32	2			6

## 人工智能创新实验班本科培养计划

### Undergraduate Program of Experimental Class for Artificial Intelligence

#### 一、培养目标

##### I. Educational Objectives

本专业培养具有良好的思想品德和文化修养、专业理论基础宽厚扎实、富于现代科学创新意识和系统思维能力，在人工智能及交叉领域从事基础研究、应用研究与组织管理的高素质复合型人才。使其掌握人工智能理论和基本方法，具有丰富的实践、动手能力，能够利用人工智能知识分析并解决实际问题，熟悉人工智能相关交叉学科知识，具备开拓人工智能新边界的创新思维，兼具国际视野和社会责任，在人工智能科学基础、系统应用和交叉融合方面具有特色。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of Artificial Intelligence.

#### 二、毕业要求

##### II. Learning Outcomes

学生掌握电子、计算机、通信和控制等多学科交叉知识，能够根据视觉、语音、大规模数据库之类的复杂输入进行智能感知、决策和控制，以增强人类的处理能力。毕业生应具备以下素质、知识和能力：

1. 工程知识：具备数学、自然科学、工程基础和自动化专业知识，并能用于解决人工智能领域的复杂工程问题；

2. 问题分析：能够应用数学、自然科学、工程科学的基本原理，表达、并通过文献研究分析复杂工程问题；设计和实施实验及分析和解释数据；

3. 设计/开发解决方案：能设计针对人工智能复杂工程问题的解决方案，设计智能系统，设备或工艺，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；

4. 研究：能够基于科学原理并采用科学方法，通过实验设计、建模仿真、数据分析与解释、验证与改进对人工智能领域的复杂工程问题进行研究并得到合理有效的结论；

5. 使用现代工具：能针对人工智能领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对人工智能领域复杂问题的预测与模拟，并能理解局限性；

6. 工程与社会：能够基于工程领域相关背景知识进行合理分析，评价人工智能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，并理解和承担工程师的社会责任；

7. 环境和可持续发展：能够理解和评价针对人工智能领域复杂工程问题的专业工程实践环境、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、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：具有团队意识和能力，能够在多学科背景下的团队中协同工作，并能承担个体、团队成员及负责人的角色；

10. 沟通：能够就人工智能领域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、陈述发言、清晰表达或回答指令，并具备一定的国际视野，能够在跨文化背景下沟通与交流；

11. 项目管理：理解并掌握工程管理原理和经济决策方法，熟悉人工智能领域项目管理的基本方法和技术，并能在多学科环境中应用；

12. 终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应技术新发展的能力。

Students master the interdisciplinary knowledge of electronics, computer, communication and control. It can intelligently perceive, make decisions and control according to the complex input of vision, voice and large-scale database, so as to enhance the processing ability of human beings. students are expected to gain:

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern tool usage: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex engineering problems in the AI field, including the prediction and modeling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practices.

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

1. 以模式识别与机器学习、视觉智能系统为基础；
2. “启于视，谋于智，精于算，践于芯，软硬兼施，知行合一”

1. This program is based on Computer Vision, Pattern recognition and Machine Learning;
2. This program is started with vision, intelligence, algorithm, implemented on the chip, combination of AI and control, software and hardware, the unity of knowing and doing.

### 四、主干学科

#### IV. Major Disciplines

人工智能 Artificial Intelligence

### 五、学制与学位

#### V. Length of Schooling and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.8 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training): 162.8 credits

完成学业最低课外学分要求：6 学分

Minimum Extracurricular Credits: 6 credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	580/31	19
		选修	160/10	5
学科基础课程		必修	880/50.3	28
专业课程	专业核心课程	必修	432/25	14
	专业选修课程	专业主选	288/17	10
		专业任选	176/11	6
集中性实践教育环节		必修	37w/18.5	18
合计			2516+37w/162.8	100
其中，总实验（实践）学时占比			380+37w/972/3108	31.27

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	580/31	19
		Elective	160/10	6
Basic Courses in Discipline		Required	880/50.3	33
Courses in Specialty	Core Courses in Specialty	Required	432/25	13
	Elective Courses in Specialty	Elective	288/17	12
	Elective Courses in Specialty	Elective	176/11	6

continue

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Practical Training	Required	37w/18.5	11
Total		2516+37w/162.8	100
Practicum Credits		380+37w	31.27

## 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	6
工程训练 (3)	必修	2/1	6
C 语言程序设计课程设计	必修	3/1.5	8
生产实习 (社会实践)	必修	2/1	6
图像处理与计算机视觉课程设计	必修	3/1.5	8
模式识别与机器学习课程设计	必修	3/1.5	8
自主智能系统课程设计	必修	3/1.5	8
智能车控制系统课程设计	必修	3/1.5	8
毕业设计 (论文)	必修	16/8	42
合计		37/18.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6
Engineering Training	Required	2/1	6
C Programming Course Project	Required	3/1.5	8
Engineering Internship (Social Practice)	Required	2/1	6
Course Project of Image Processing & Computer Vision	Required	3/1.5	8
Course Project of Pattern recognition & Machine Learning	Required	3/1.5	8
Course Project of Autonomous Intelligent System	Required	6/3	16
Undergraduate Thesis	Required	16/8	42
Total		37/18.5	100

## 3. 课外学分 (实验班学生 6 个课外学分中要求包含至少 2 学分的竞赛或论文学分)

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩	2
3	劳动教育 (必修)	完成劳动教育类课程满 32 学时	2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
5	竞赛	省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	国际交流	参与专业学科相关的海外知名高校学术夏令营、暑期学校等 2 周以上, 获得结业证书		1
		参加国内外举办的国际学术会议, 有海报展示或做会议报告		1-2
7	论文	在国内外正式期刊上发表论文	每篇论文	2-3
8	专利	和专业相关并正式获得专利公开号	每项前两名	2-3
9	学术活动	参加学术讲座, 上交学术讲座记录表, 并选取其中感兴趣的一次讲座书写成书面报告, 通过学院认证者		1
10 •	科研	在科研课题组参加科研实践, 通过答辩, 提交课题研究报告	每项 (视参与科研项目、创新实践项目时间、科研能力、科研成果)	1
		完成院级大学生创新创业训练项目		1
		完成校级大学生创新创业训练项目		2
		完成省级、国家级大学生创新创业训练项目		3

注: 1. 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。

2. 标注 • 的项目为必须完成的项目

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2 •	Ideological and political course Social Practice	Submitting a report and obtain a passing score		2
3 •	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	325 Points or Higher	3
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
5	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win Third prize	2



continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
5	Competitions	National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
6	International Exchange	Taking part in Academic Summer camp or Summer School in famous overseas universities related to discipline for 2 weeks or more, and getting the graduation certificate;		1
		Taking part in international academic conference held at home and abroad, with poster display or make conference report.		1
7	Academic Paper	Published in national-level journals	Each paper	2-3
8	Patent	Officially obtained patent publication number	Each program	2-3
9	Academic Activities	Participate in the Learned Lecture organized by school, submit lecture records and submit report for one lecture; obtain proof of school		1
10 •	Scientific Research	Participated in scientific research practice and passed the defense	Each item (Depending on both the time spent in and ability demonstrated in scientific research project)	1
		Innovation and entrepreneurship training program of school		1
		Innovation and entrepreneurship training program of university/province		2
		Innovation and entrepreneurship training program of nation		3

Note :1. In HUST Sports Meeting, the first and the second prize, the third to the fifth prize and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

2. “•” shows that the item and requirements must be completed by every student.

## 七、主要课程及创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses in Specialty

电路理论 Circuit Theory、电子技术 Electronic Technology、模拟电子技术 Analog Electronics、数字电路与逻辑设计 Digital Circuit and Logic Design、计算机组成与嵌入式系统 Computer Organization and Embedded Systems、自动控制原理 Control Theory、数据结构与算法分析 Data Structure and Algorithmic Analysis、人工智能导论 Foundation of Artificial Intelligence、机器学习 Machine Learning、模式识别 Pattern Recognition、计算机视觉 Computer Vision 等

#### 2. 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程：专业概论（智能中国）、人工智能导论

Orientational Innovation (Entrepreneurship) Courses: Introduction to Specialty、Foundation of AI.

创新能力培养类课程：计算机组成与嵌入式系统、模式识别、计算机视觉、自主智能系统

Capacity-building Innovation (Entrepreneurship) Courses: Computer Organization and Embedded Systems、Pattern Recognition、Computer Vision、Swarm Intelligence.

创新实践训练类课程：模式识别与机器学习课程设计、图像处理与计算机视觉课程设计、自主智能系统课程设计

Innovative Practice Training Courses: Course Projects of Autonomous Intelligent System, Course Projects of Pattern Recognition & Machine, Course Projects of Image Processing & Computer Vision.

## 八、主要实践教学环节（含专业实验）

## VIII. Main Internship and Practical Training (Including experiments)

军事训练 Military Training、生产实习 Engineering Internship、课程设计 Course Project、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

## IX. Table of Teaching Schedule

院（系）：人工智能与自动化学院

专业：人工智能

School (Department) : School of Artificial Intelligence and Automation

Major: Artificial Intelligence

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Current Affairs and Policy	48	1.5			5-7
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Fundamental English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Fundamental English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
	必修 Required	MAT0551	高等数学（A）上 Calculus ( I ) (A)	88	5.5			1
	必修 Required	MAT0531	高等数学（A）下 Calculus ( I ) (B)	88	5.5			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	AUT0553	离散数学 Discrete Mathematics	32	2			3
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.8	24		3
	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language（C）	56	3.5		20	1
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		2
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			3
	必修 Required	ELC0591	模拟电子技术（二） Analog Electronics（II）	56	3.5			3
	必修 Required	EIC0551	电子线路设计、测试与实验（一） Electronic Circuitry Design Test and Experiments（I）	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试与实验（二） Electronic Circuitry Design Test and Experiments（II）	32	1	32		4
专业核心课程 Core courses in Specialty	必修 Required	AUT2252	最优化理论与方法 Optimization Theory and Method	48	3			3
	必修 Required	AUT2291	数据结构与算法分析 Data Structure and Algorithmic Analysis	64	3.5	16		3
	必修 Required	AUT2242	人工智能导论 Foundation of Artificial Intelligence	40	2.25	8		4
	必修 Required	AUT5951	数据科学基础 Foundation of Data Science	32	2			4
	必修 Required	AUT6281	计算机组成与嵌入式系统 Computer Organization and Embedded Systems	64	3.5	16		4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Core courses in Specialty 专业核心课程	必修 Required	AUT2101	自动控制原理（一） Control Theory	56	3.5			4
	必修 Required	AUT0011	模式识别 Pattern Recognition	48	2.75	8		4（上）
	必修 Required	AUT0021	机器学习 Machine Learning	40	2.25	8		4（下）
	选修 Elective	AUT0031	计算机视觉 Computer Vision	40	2.25	8		6
专业选修课程 Elective courses in Specialty			专业主选课程 Main Electives in Specialty	288	17			
	选修 Elective	AUT5642	数字图像处理 Digital Image Processing	40	2.25	8		5
	选修 Elective	AUT5663	数字信号处理 Digital Signal Processing	40	2.25	8		5
	选修 Elective	AUT2232	自动控制原理（二） Control Theory（II）	40	2.5			5
	选修 Elective	AUT5381	计算机网络 Computer Network	40	2.5	8		5
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2			5（前）
	选修 Elective	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
	选修 Elective	AUT6083	脑与认知科学导论 Introduction to Brain and Cognition Science	32	1.75	8		6
	选修 Elective	AUT6232	智能芯片设计 Design of Intelligent Chip	32	1.75	8		6
	选修 Elective	AUT6251	自主智能系统 Swarm Intelligence	32	2			6
			专业选修课程 Electives in Specialty	176	11			
	选修 Elective	AUT6321	专业概论（智能中国） Introduction to Specialty	32	2			1
	选修 Elective	AUT6161	文献检索与科技论文写作 Document Retrieval & Scientific Paper Writing	16	1			2
	选修 Elective	AUT6001	Python 程序设计 Python Programming	40	2.5		16	5
	选修 Elective	AUT5451	面向对象的程序设计 Object Orient Program Design	40	2.5		8	5
	选修 Elective	AUT5031	Java 程序设计 Java Programming	40	2.5		16	5
	选修 Elective	AUT5621	数据库技术 Database Technology	32	2			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Required	AUT5211	复杂性科学基础 Foundation of Complexity Sciences	32	2			5
	选修 Elective	AUT5311	互联网技术及应用 Internet Technology and Application	32	2		8	5
	选修 Elective	AUT5792	系统建模 System Modeling	32	2			5
	选修 Elective	AUT0041	项目管理 Project Management	32	2			5
	选修 Elective	AUT5521	软件工程 Software Engineering	24	1.5		8	5
	选修 Elective	AUT5771	系统仿真与 Matlab Matlab System Simulation and Matlab	32	2	4		5
	选修 Elective	AUT5251	管理信息系统 Management Information System	32	2			5
	选修 Elective	AUT2072	计算机控制技术 Computer Control Technology	24	1.5			5
	选修 Elective	AUT2271	传感技术 Sensor Technology	40	2.5	8		5
	选修 Elective	AUT2061	工程光学 Engineering Optics	48	3	8		5
	选修 Elective	AUT6021	工程伦理（案例讲座） Engineering Ethic	32	2			6
	选修 Elective	AUT5051	博弈论 Game Theory	32	2			6
	选修 Elective	AUT0531	计算方法（二） Computational Method（II）	32	2			6
	选修 Elective	AUT6011	并行计算 Parallel Computing	32	2			6
	选修 Elective	AUT6121	神经网络 Neural Network	32	2			6
	选修 Elective	AUT5691	图像理解与分析 Image Understanding and Analysis	32	2			6
	选修 Elective	AUT6311	工业人工智能技术及应用 Technology and Application of Industrial Artificial Intelligence	32	2		8	6
	选修 Elective	AUT5181	动画与游戏设计 Animation and Game Design	32	2			6
	选修 Elective	AUT5121	单片机原理 Principle of Single Chip Microcomputer	32	2	8		6
	选修 Elective	AUT5881	智能控制 Intelligent Control	32	2			6
	选修 Elective	AUT6171	虚拟现实技术（网易） Virtual Reality Technology	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Elective courses in Specialty 专业选修课程	选修 Elective	AUT5871	智能计算（一） Intelligent Computing ( I )	32	2			7
	选修 Elective	AUT6191	智能机器人 Intelligent Robotics	24	1.5	8		7
	选修 Elective	AUT5721	网络安全 Network Security	32	2			7
	选修 Elective	AUT5131	导弹概论 Introduction Missile	16	1			7
	选修 Elective	AUT6241	自然语言处理 Natural Language Processing	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（3） Engineering Training ( III )	2w	1			1
	必修 Required	ENG3551	工程训练（7） Engineering Training ( VII )	2w	1			3
	必修 Required	AUT3511	C 语言程序设计课程设计 Course Project for C Programming	3w	1.5			2
	必修 Required	AUT3751	模式识别与机器学习课程设计 Course Project of Pattern Recognition & Machine Learning	3w	1.5			5
	必修 Required	AUT3761	图像处理与计算机视觉课程设计 Course Project of Image Processing & Computer Vision	3w	1.5			7
	必修 Required	AUT3741	自主智能系统课程设计 Course Project of Autonomous Intelligent System	3w	1.5			7
	必修 Required	AUT3671	智能车控制系统课程设计 Course Project for Control System of Smart Car	3w	1.5			7
	必修 Required	AUT3621	生产实习 Engineering Internship	2w	1			6
	必修 Required	AUT3521	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 人工智能专业本硕博实验班培养计划（本科阶段）

### Undergraduate Program of Experimental Class for Artificial Intelligence

#### 一、培养目标

##### I . Educational Objectives

本硕博实验班，探索具有深厚基础的工程研究创新人才培养模式。目标是培养德、智、体、美、劳全面发展，具有良好思想品德和心理素质、深厚的基础知识、富于现代学科科学创新意识和系统思辨能力，兼具国际视野和社会责任感的领军人才。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of Artificial Intelligence.

#### 二、毕业要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有扎实的数理基础；
2. 掌握工科专业的基本理论和方法；
3. 具有研究解决工科领域基础理论和实际问题的能力；
4. 具有较强的英语语言能力，能开展国际学术交流；
5. 掌握文献检索、资料查询的方法和撰写科学论文的能力；
6. 具有较好的人文社科知识和人文素质，以及较强的协调、组织能力；
7. 具有较强的创新精神。

Students are expected to gain the following abilities:

1. Solid foundation in both mathematics and physics;
2. Mastery of the basic theories and methods in Engineering;
3. Skills in research and problem solving in Engineering;
4. Mastery of English;
5. Ability to do literature searching, data collection and thesis writing;
6. Attainment in humanities and art, cooperative and organizational skills;
7. Sense of creation and innovation.

#### 三、培养特色

##### III . Program Highlights

以数学、物理为基础，强调拔尖研究型人才的良好思想品德和心理素质训练，强调数理基础与专业能力的结合，强调厚积薄发的长线培养模式，具有较强的工程实践和创新能力，培养能从事跨专业乃至跨学科综合研究和高层次技术开发的优秀人才。

Based on mathematics and physics, emphasizing on good moral character and mental qualities, combining grounding in mathematics and physics with professional ability, underlining long-term talent training system, students have abilities of practice and innovation, the program provide talent of inter-discipline or cross subjects research and high level technique developing.

#### 四、主干学科

#### IV. Major Disciplines

人工智能 Artificial Intelligence

#### 五、学制与学位（本科阶段）

#### V. Program Length and Degree

学制：四年制

Duration: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

#### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.8 学分。其中，学科基础课程、专业核心课程不允许用其他课程学分冲抵和替代；专业选修课程可从研究生课程中修读，研究生课程认定为本科专业选修课程的学分数不超过 5 学分。

Minimum Credits of Curricular (Comprising course system and intensified internship practical training): 162.8 credits. Discipline-related basic courses and core courses cannot be covered using credits from other courses in the program. Common elective courses in specialty can be chosen from graduate courses. The credits of graduate courses recognized as undergraduate elective courses should not exceed 5 credits.

完成学业最低课外学分要求：6 学分

Minimum Extracurricular Credits: 6 credits

##### 1. 课程体系学时与学分

##### Hours/Credits of Course System

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	580/31	19
		选修	160/10	5
学科基础课程		必修	888/50.8	29
专业 课程	专业核心课程	必修	432/25	14
	专业主选课程	选修	288/17	9
	专业任选课程	选修	168/10.5	5
集中性实践教学环节		必修	37w/18.5	19
合计			2516+37w/162.8	100
其中，总实验（实践）学时占比			380+37w	30.84

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	580/31	19
		Elective	160/10	6
Basic Courses in Discipline		Required	888/50.8	34
Courses in Specialty	Core Courses in Specialty	Required	432/25	13
	Elective Courses in Specialty	Elective	456/27.5	17
Practical Training		Required	37w/18.5	11
Total			2516+37w/162.8	100
Practicum Credits			380+37w	30.84

##### 2. 集中性实践教学环节周数与学分

##### Practicum Credits



华中科技大学 2022 级本科专业培养计划

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	6
工程训练 (3)	必修	2/1	6
C 语言程序设计课程设计	必修	3/1.5	8
生产实习 (社会实践)	必修	2/1	6
图像处理与计算机视觉课程设计	必修	3/1.5	8
模式识别与机器学习课程设计	必修	3/1.5	8
自主智能系统课程设计	必修	3/1.5	8
智能车控制系统课程设计	必修	3/1.5	8
毕业设计 (论文)	必修	16/8	42
合计		37/18.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	6
C Programming Course Project	Required	3/1.5	8
Engineering Internship (Social Practice)	Required	2/1	8
Course Project of Image Processing & Computer Vision	Required	3/1.5	8
Course Project of Pattern recognition & Machine Learning	Required	3/1.5	8
Course Project of Autonomous Intelligent System	Required	6/3	16
Undergraduate Thesis	Required	16w/8	42
Total		37/18.5	100

3. 课外学分

Extracurricular Credits (本硕博班学生必须拿到最低 2 学分的竞赛或论文学分)

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2•	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3•	劳动教育 (必修)	完成劳动教育类课程满 32 学时		2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	国际交流	参与专业学科相关的海外知名高校学术夏令营、暑期学校等 2 周以上, 获得结业证书		1
		参加国内外举办的国际学术会议, 有海报展示或做会议报告		1-2
7	论文	在国内外正式期刊上发表论文	每篇论文	2-3
8	专利	和专业相关并正式获得专利公开号	每项前两名	2-3

续表

序号	课外活动名称	课外活动和社会实践的要求	课外学分
9	学术活动	参加学术讲座，上交学术讲座记录表，并选取其中感兴趣的一次讲座书写成书面报告，通过学院认证者	1
10 •	科研	在科研课题组参加科研实践，通过答辩，提交课题研究报告	1
		完成院级大学生创新创业训练项目	1
		完成校级大学生创新创业训练项目	2
		完成省级、国家级大学生创新创业训练项目	3

注：1. 参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

2. 标注 • 的项目为必须完成的项目

No.	Extracurricular Activities and Social Practice	Requirements	Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense	2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province	2
2 •	Ideological and political course Social Practice	Submitting a report and obtain a passing score	2
3 •	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours	2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements
		TOEFL	90 Points or Higher
		IELTS	6.5 Points or Higher
		GRE	325 Points or Higher
		National Computer Rank Examination	Win certificate of Band-2 or higher
		National Computer Software Qualification	Win certificate of programmer
			Win certificate of Advanced Programmer
			Win certificate of System Analyst
5	Competitions	University Level	Win first prize
			Win second prize
			Win third prize
		Provincial Level	Win first prize
			Win second prize
			Win Third prize
		National Level	Win first prize
			Win second prize
			Win third prize
6	International Exchange	Taking part in Academic Summer camp or Summer School in famous overseas universities related to discipline for 2 weeks or more, and getting the graduation certificate;	1
		Taking part in international academic conference held at home and abroad, with poster display or make conference report.	1
7	Academic Paper	Published in national-level journals	Each paper
8	Patent	Officially obtained patent publication number	Each program

continue

No.	Extracurricular Activities and Social Practice	Requirements	Extracurricular Credits
9	Academic Activities	Participate in the Learned Lecture organized by school, submit lecture records and submit report for one lecture; obtain proof of school	1
10 •	Scientific Research	Participated in scientific research practice and passed the defense	1
		Innovation and entrepreneurship training program of school	1
		Innovation and entrepreneurship training program of university/province	2
		Innovation and entrepreneurship training program of nation	3

Note :1. In HUST Sports Meeting, the first and the second prize, the third to the fifth prize and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

2. “•” shows that the item and requirements must be completed by every student.

## 七、主要课程及创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses in Specialty

电路理论 Circuit Theory、电子技术 Electronic Technology、模拟电子技术 Analog Electronics、数字电路与逻辑设计 Digital Circuit and Logic Design、计算机组成与嵌入式系统 Computer Organization and Embedded Systems、自动控制原理 Control Theory、数据结构与算法分析 Data Structure and Algorithmic Analysis、人工智能导论 Foundation of Artificial Intelligence、机器学习 Machine Learning、模式识别 Pattern Recognition、计算机视觉 Computer Vision 等

#### 2. 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程：专业概论（智能中国）、人工智能导论

Orientational Innovation (Entrepreneurship) Courses: Introduction to Specialty、Foundation of AI.

创新能力培养类课程：计算机组成与嵌入式系统、模式识别、计算机视觉、自主智能系统

Capacity-building Innovation (Entrepreneurship) Courses: Computer Organization and Embedded Systems、Pattern Recognition、Computer Vision、Swarm Intelligence.

创新实践训练类课程：模式识别与机器学习课程设计、图像处理与计算机视觉课程设计、自主智能系统课程设计

Innovative Practice Training Courses: Course Projects of Autonomous Intelligent System, Course Projects of Pattern Recognition & Machine, Course Projects of Image Processing & Computer Vision.

## 八、主要实践教学环节（含专业实验）

### VIII. Main Internship and Practical Training (Including experiments)

军事训练 Military Training、生产实习 Engineering Internship、课程设计 Course Project、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

### IX. Table of Teaching Schedule

院（系）：人工智能与自动化学院

School (Department) : School of Artificial Intelligence and Automation

专业：人工智能

Major: Artificial Intelligence

华中科技大学 2022 级本科专业培养计划

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Courses Essential-qualities-oriented Education General	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语 (一) Fundamental English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 (二) Fundamental English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 (二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育 (三) Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程, 美育类、大学生心理健康课程均不低于 2 学分, 总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0552	微积分 (A) 上 Calculus ( I ) (A)	96	6			1
	必修 Required	MAT0532	微积分 (A) 下 Calculus ( II ) (B)	96	6			2
	必修 Required	MAT0722	线性代数 (A) Linear Algebra (A)	48	3			1
	必修 Required	MAT0592	概率论与数理统计 (A) Probability and Mathematics Statistics (A)	48	3			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	AUT0552	离散数学 Discrete Mathematics	48	3			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in Discipline	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.8	24		3
	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language（C）	56	3.5		20	1
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		2
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			3
	必修 Required	ELC0591	模拟电子技术（二） Analog Electronics（II）	56	3.5			3
	必修 Required	EIC0551	电子线路设计、测试与实验（一） Electronic Circuitry Design Test and Experiments（I）	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试与实验（二） Electronic Circuitry Design Test and Experiments（II）	32	1	32		4
专业核心课程 Core courses in Specialty	必修 Required	AUT2252	最优化理论与方法 Optimization Theory and Method	48	3			3
	必修 Required	AUT2291	数据结构与算法分析 Data Structure and Algorithmic Analysis	64	3.5	16		3
	必修 Required	AUT2242	人工智能导论 Foundation of Artificial Intelligence	40	2.25	8		4
	必修 Required	AUT5951	数据科学基础 Foundation of Data Science	32	2			4
	必修 Required	AUT6281	计算机组成与嵌入式系统 Computer Organization and Embedded Systems	64	3.5	16		4
	必修 Required	AUT2101	自动控制原理（一） Control Theory（I）	56	3.5			4
	必修 Required	AUT0011	模式识别 Pattern Recognition	48	2.75	8		4 （上）
	必修 Required	AUT0021	机器学习 Machine Learning	40	2.25	8		4 （下）
	必修 Required	AUT5351	计算机视觉 Computer Vision	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty			专业主选课程 Main Electives in Specialty	288	17			
	选修 Elective	AUT5381	计算机网络 Computer Network	40	2.25	8		5
	选修 Elective	AUT2232	自动控制原理 (二) Control Theory (II)	40	2.5			5
	选修 Elective	AUT5642	数字图像处理 Digital Image Processing	40	2.25	8		5
	选修 Elective	AUT5663	数字信号处理 Digital Signal Processing	40	2.25	8		5
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2	8		5 (前)
	选修 Elective	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
	选修 Elective	AUT6083	脑与认知科学导论 Introduction to Brain and Cognition Science	32	1.75	8		6
	选修 Elective	AUT6101	群体智能 Swarm Intelligence	24	1.5			6
	选修 Elective	AUT6232	智能芯片设计 Design of Intelligent Chip	32	1.75	8		6
	选修 Elective	AUT6251	自主智能系统 Swarm Intelligence	32	2			6
			专业选修课程 Electives in Specialty	168	10.5			
	选修 Elective	AUT6321	专业概论 (智能中国) Introduction to Specialty	32	2			1
	选修 Elective	AUT5411	科学研究方法 Introduction of Science Research	32	2			2
	选修 Elective	AUT6001	Python 程序设计 Python Programming	40	2.5		16	5
	选修 Elective	AUT5451	面向对象的程序设计 Object Orient Program Design	40	2.5		8	5
	选修 Elective	AUT5031	Java 程序设计 Java Programming	40	2.5		16	5
	选修 Elective	AUT5621	数据库技术 Database Technology	32	2			5
	选修 Required	AUT5211	复杂性科学基础 Foundation of Complexity Sciences	32	2			5
	选修 Elective	AUT5311	互联网技术及应用 Internet Technology	32	2		8	5
	选修 Elective	AUT5521	软件工程 Software Engineering	24	1.5		8	5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT5792	系统建模 System Modeling	32	2			5
	选修 Elective	AUT5771	系统仿真与 Matlab Matlab System Simulation and Matlab	32	2	4		5
	选修 Elective	AUT5251	管理信息系统 Management Information System	32	2			5
	选修 Elective	AUT2071	计算机控制技术 Computer Control Technology	24	1.5			5
	选修 Elective	AUT2271	传感技术 Sensor Technology	40	2.5	8		5
	选修 Elective	AUT2061	工程光学 Engineering Optics	48	3	8		5
	选修 Elective	AUT6021	工程伦理（案例讲座） Engineering Ethic	32	2			6
	选修 Elective	AUT5051	博弈论 Game Theory	32	2			6
	选修 Elective	AUT0531	计算方法（二） Computational Method（II）	32	2			6
	选修 Elective	AUT6011	并行计算 Parallel Computing	32	2			6
	选修 Elective	AUT6121	神经网络 Neural Network	32	2			6
	选修 Elective	AUT6311	工业人工智能技术及应用 Technology and Application of Industrial Artificial Intelligence	32	2			6
	选修 Elective	AUT5121	单片机原理 Principle of Single Chip Microcomputer	32	2	8		6
	选修 Elective	AUT5881	智能控制 Intelligent Control	32	2			6
	选修 Elective	AUT5691	图像理解与分析 Image Understanding and Analysis	32	2			6
	选修 Elective	AUT5181	动画与游戏设计 Animation and Game Design	32	2			6
	选修 Elective	AUT6171	虚拟现实技术 Virtual Reality Technology	32	2			7
	选修 Elective	AUT5871	智能计算（一） Intelligent Computing（I）	32	2			7
	选修 Elective	AUT6191	智能机器人 Intelligent Robotics	24	1.5	8		7
	选修 Elective	AUT5721	网络安全 Network Security	32	2			7
	选修 Elective	AUT5131	导弹概论 Introduction Missile	16	1			7

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
	选修 Elective	AUT6241	自然语言处理 Natural Language Processing	32	2			7
	选修 Elective	MAT5091	泛函分析选讲 Selected Topics in Functional Analysis	40	2.5			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练 (3) Engineering Training (III)	2w	1			1
	必修 Required	AUT3511	C 语言程序设计课程设计 Course Project for C Programming	3w	1.5			2
	必修 Required	AUT3751	模式识别与机器学习课程设计 Course Project of Pattern Recognition & Machine Learning	3w	1.5			5
	必修 Required	AUT3761	图像处理与计算机视觉课程设计 Course Project of Image Processing & Computer Vision	3w	1.5			7
	必修 Required	AUT3671	智能车控制系统课程设计 Course Project for Control System of Smart Car	3w	1.5			7
	必修 Required	AUT3741	自主智能系统课程设计 Course Project of Autonomous Intelligent System	3w	1.5			7
	必修 Required	AUT3621	生产实习 Engineering Internship	2w	1			6
	必修 Required	AUT3521	毕业设计 (论文) Undergraduate Thesis	16w	8			8



## 自动化专业本科培养计划

### Undergraduate Program for Specialty in Automation

#### 一、培养目标

##### I. Educational Objectives

本专业培养人格健全，责任感强，具备基本科学和工程技术素养、具有数学物理和电工电子基础知识，掌握信息与自动控制技术、计算机软硬件知识和控制系统设计、分析、开发和应用技能，在自动化专业具有交叉学科专业知识、专业特长和创新实践能力的综合型工程技术人才，以及能从事理论研究、科技开发与组织管理的高素质复合型人才。

学生毕业后，可从事自动化、智能制造与服务等相关领域的科学研究、技术开发、应用维护及管理工作，并具备在工作中继续学习、不断更新知识的能力。经过实践锻炼后，能成为控制科学与工程或相关领域具有家国情怀和国际视野、引领未来和造福人类的领军人才。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of controllable science and engineering project.

#### 二、毕业要求

##### II. Learning Outcomes

要求学生系统、坚实地掌握各种现代控制系统中共存的信息获取及处理技术、系统分析与设计方法、管理与决策等方面的基本理论和实践技能。毕业生应具备以下素质、知识和能力：

1. 工程知识：具备数学、自然科学、工程基础和自动化专业知识，并能用于解决自动化领域的复杂工程问题；

2. 问题分析：能够应用数学、自然科学、工程科学的基本原理，表达、并通过文献研究分析自动化复杂工程问题；设计和实施实验及分析和解释数据；

3. 设计/开发解决方案：能设计针对自动化复杂工程问题的解决方案，设计自动化系统，设备或工艺，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；

4. 研究：能够基于科学原理并采用科学方法，通过实验设计、建模仿真、数据分析与解释、验证与改进对自动化领域的复杂工程问题进行研究并得到合理有效的结论；

5. 使用现代工具：能针对自动化领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对自动化领域复杂问题的预测与模拟，并能理解局限性；

6. 工程与社会：能够基于工程领域相关背景知识进行合理分析，评价自动化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，并理解和承担工程师的社会责任；

7. 环境和可持续发展：能够理解和评价针对自动化领域复杂工程问题的专业工程实践环境、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、社会责任感，能够在控制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：具有团队意识和能力，能够在多学科背景下的团队中协同工作，并能承担个体、团队成员及负责人的角色；

10. 沟通：能够就自动化领域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、陈述发言、清晰表达或回答指令，并具备一定的国际视野，能够在跨文化背景下沟通与交流；

11. 项目管理：理解并掌握工程管理原理和经济决策方法，熟悉控制工程领域项目管理的基本方法和技术，并能在多学科环境中应用；

12. 终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应技术新发展的能力。

Having the ability of systematically and firmly gaining information, processing, analyzing, designing and making policy in the field of modern controllable system, students are expected to gain:

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

2. Complex Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Modern tool usage: Be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools for complex engineering problems in the automation field, including the prediction and modeling, to complex engineering problems, with an understanding of the limitations.

6. The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practices.

9. Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### 三、培养特色

#### III. Program Highlights

1. 以现代控制技术、现代电子技术、现代信息技术和现代网络通信技术为基础；
2. 控（制）管（理）结合、强（电）弱（电）并重、软（件）硬（件）兼施。

1. This program is based on modern control, electronics, and information and Internet telecommunication;

2. This program is the combination of control and management, software and hardware.

### 四、主干学科

#### IV. Major Disciplines

控制科学与工程 Control Technology and Engineering

### 五、学制与学位

#### V. Length of Schooling and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：163.3 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training) : 160 credits

完成学业最低课外学分要求：5 学分

Minimum Extracurricular Credits: 5 credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	580/31	19
		选修	160/10	6
学科基础课程		必修	984/56.8	30
专业课程	专业核心课程	必修	408/24.5	14
	专业限选课程	选修	288/15.5	8
	专业选修课程	选修	96/6	4
集中性实践教学环节		必修	38w/19	19
合计			2516+38w/162.8	100
其中，总实验（实践）学时占比			398+38w	32

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	580/31	19
		Elective	160/10	6
Basic Courses in Discipline		Required	984/56.8	30
Courses in Specialty	Core Courses in Specialty	Required	408/24.5	14
	Elective Courses in Specialty	Elective	384/21.5	12
Practical Training		Required	38w/19	19
Total			2516+38w/162.8	100
Practicum Credits			398+38w	32

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5
工程训练 (3)、(7)	必修	4/2	10
C 语言课程设计	必修	3/1.5	8
生产实习 (社会实践)	必修	2/1	5
控制理论、控制技术课程设计	必修	4/2	11
过程、运动控制系统课程设计	必修	4/2	11
模式识别与机器学习课程设计	选修	3/1.5	8
毕业设计 (论文)	必修	16/8	42
合计		38/19	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5
Engineering Training (III)	Required	2/1	5
Engineering Training (VII)	Required	2/1	5
C Programming Course Project	Required	3/1.5	8
Engineering Internship (Social Practice)	Required	2/1	5
Course Project	Required	11/5.5	30
Undergraduate Thesis	Required	16/8	42
Total		38/19	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩	2
3	劳动教育 (必修)	完成劳动教育类课程满 32 学时	2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者
		全国	获一等奖者
			获二等奖者
			获三等奖者
6	国际交流	参与专业学科相关的海外知名高校学术夏令营、暑期学校等 2 周以上, 获得结业证书	1
		参加国内外举办的国际学术会议, 有海报展示或做会议报告	1-2

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
7	论文	在国内外正式期刊上发表论文	每篇论文	2-3
8	专利	和专业相关并正式获得专利公开号	每项前两名	2-3
9	学术活动	参加学术讲座, 上交学术讲座记录表, 并选取其中感兴趣的一次讲座书写成书面报告, 通过学院认证者		1
10 •	科研	在科研课题组参加科研实践, 通过答辩, 提交课题研究报告	每项 (视参与科研项目、创新实践项目时间、科研能力、科研成果)	1
		完成院级大学生创新创业训练项目		1
		完成校级大学生创新创业训练项目		2
		完成省级、国家级大学生创新创业训练项目		3

注: 1. 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。

2. 标注 • 的项目为必须完成的项目

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2 •	Ideological and political course Social Practice	Submitting a report and obtain a passing score		2
3 •	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	325 Points or Higher	3
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
5	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win Third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
6	International Exchange	Taking part in Academic Summer camp or Summer School in famous overseas universities related to discipline for 2 weeks or more, and getting the graduation certificate;		1
		Taking part in international academic conference held at home and abroad, with poster display or make conference report.		1

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
7	Academic Paper	Published in national-level journals	Each paper	2-3
8	Patent	Officially obtained patent publication number	Each program	2-3
9	Academic Activities	Participate in the Learned Lecture organized by school, submit lecture records and submit report for one lecture; obtain proof of school		1
10 •	Scientific Research	Participated in scientific research practice and passed the defense	Each item (Depending on both the time spent in and ability demonstrated in scientific research project)	1
		Innovation and entrepreneurship training program of school		1
		Innovation and entrepreneurship training program of university/province		2
		Innovation and entrepreneurship training program of nation		3

Note :1. In HUST Sports Meeting, the first and the second prize, the third to the fifth prize and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

2. “•” shows that the item and requirements must be completed by every student.

## 七、主要课程及创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses in Specialty

电路理论 Circuit Theory、模拟电子技术 Analog Electronics、数字电路与逻辑设计 Digital Circuit and Logic Design、微机原理 Computer Theory、自动控制原理 (一) Control Theory ( I )、自动控制原理 (二) Control Theory ( II )、计算机控制技术 Computer Control Technology、传感技术 Sensor Technology

#### 2. 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程：专业概论

Orientational Innovation (Entrepreneurship) Courses: Introduction to Specialty.

创新能力培养类课程：微机原理、自动控制原理 (一)、自动控制原理 (二)

Capacity-building Innovation (Entrepreneurship) Courses: Principle of Microcomputer、Control Theory ( I )、Control Theory ( II ) .

创新实践训练类课程：控制技术课程设计、过程控制系统课程设计、运动控制系统课程设计、毕业设计

Innovative Practice Training Courses: Control Technology Course Project、Process Control Course Project、Movement Control System Course Project、Undergraduate Thesis.

## 八、主要实践教学环节 (含专业实验)

### VIII. Main Internship and Practical Training (Including experiments)

军事训练 Military Training、工程训练 Engineering Training、生产实习 Engineering Internship、课程设计 Course Project、毕业设计 Undergraduate Thesis

## 九、教学进程计划表

### IX. Table of Teaching Schedule

院 (系)：人工智能与自动化学院

School (Department)：School of Artificial Intelligence and Automation

专业：自动化

Major: Automation

华中科技大学 2022 级本科专业培养计划

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语 (一) Fundamental English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 (二) Fundamental English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 (二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育 (三) Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程, 美育类、大学生心理健康课程均不低于 2 学分, 总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0551	微积分 (一) 上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分 (一) 下 Calculus ( I )	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MESE0891	工程制图 (一) Engineering Graphics ( I )	40	2.5			1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in General Discipline	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language (C)	56	3.5		20	1
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physics Experiments (I)	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physics Experiments (II)	24	0.8	24		3
	必修 Required	EEE0641	电路理论 (三) Circuit Theory (III)	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		2
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			3
	必修 Required	EIC0591	模拟电子技术 (二) Analog Electronics (II)	56	3.5			3
	必修 Required	EIC0551	电子线路设计、测试与实验 (一) Electronic Circuitry Design Test and Experiments (I)	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试与实验 (二) Electronic Circuitry Design Test and Experiments (II)	32	1	32		4
	必修 Required	AUT0571	信号分析 Signal Analysis	32	2			4
	必修 Required	AUT0582	数据结构 Data Structure	40	2.25		8	3
	必修 Required	AUT0563	微机原理 Principle of Microcomputer	56	3	16		4
	必修 Required	AUT0531	计算方法 (二) Computational Methods (II)	32	2			4
	必修 Required	AUT2201	运筹学 (一) Operational Research (I)	32	2			4
	必修 Required	AUT5381	计算机网络 Computer Network	40	2.5	8		5
专业核心课程 Core courses in Specialty	必修 Required	AUT2222	自动控制原理 (一) Control Theory (I)	56	3.5			4
	必修 Required	AUT2232	自动控制原理 (二) Control Theory (II)	40	2.5			5
	必修 Required	AUT2272	传感技术 Sensor Technology	40	2.25	8		5
	必修 Required	AUT2072	计算机控制技术 Computer Control Technology	24	1.5			5



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Core courses in Specialty	必修 Required	AUT6301	电机拖动基础 Foundation of Electrical Machinery Driving	48	3			5
	必修 Required	AUT6291	功率电子技术与运动控制 Power Electronic Technology and Motion Control System	64	4			6
	必修 Required	AUT5303	过程控制系统 Process Control System	40	2.5			6
专业选修课程 Elective courses in Specialty			专业限选课程 Selected Electives in Specialty	288	15.5			
	选修 Elective	AUT6321	专业概论（智能中国） Introduction to Specialty	32	2			1
	选修 Elective	AUT6161	文献检索与科技论文写作 Document Retrieval & Scientific Paper Writing	16	1			2
	选修 Elective	AUT6021	工程伦理 Engineering Ethic	32	2			3
	必修 Required	AUT2242	人工智能导论 Introduction to Artificial Intelligence	40	2.25	8		4
	选修 Elective	AUT2091	控制理论综合实验 Control Theory Experiment	32	1	32		4-5
	选修 Elective	AUT5792	系统建模 System Model	32	2			5
	选修 Elective	AUT6071	模式识别与机器学习 Pattern Recognition and Machine Learning	32	2			5
	二选一 One out of two	AUT5021	DSP 原理与应用 Principle and Application of DSP	32	1.75	8		6
		AUT5121	单片机原理 Principle of Single Chip Microcomputer	32	1.75	8		6
	选修 Elective	AUT5433	控制技术综合实验 Control Technology Experiment	32	1	32		6
	选修 Elective	AUT6261	系统集成与优化 System Integration & Optimization	40	2.5			6
			专业选修课程 Electives in Specialty	144	6			
	选修 Elective	AUT0553	离散数学 Discrete Mathematic	32	2			5
	选修 Elective	AUT6001	Python 程序设计 Python Programming	40	2.5		16	5
	选修 Required	AUT5211	复杂性科学基础 Foundation of Complexity Sciences	32	2			5
	选修 Elective	AUT5451	面向对象的程序设计 Object Orient Program Design	40	2.5		8	5
	选修 Elective	AUT5031	Java 程序设计 Java Programming	40	2.5		16	5

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT5621	数据库技术 Database Technology	32	2			5
	选修 Elective	AUT5311	互联网技术及应用 Internet Technology and Application	32	2		8	5
	选修 Elective	AUT5951	数据科学基础 Foundation of Data Science	32	2			5
	选修 Elective	AUT2211	运筹学（二） Operational Research ( I )	32	2			5
	选修 Elective	AUT5771	系统仿真与 Matlab Matlab System Simulation and Matlab	32	2	4		5
	选修 Elective	AUT5521	软件工程 Software Engineering	24	1.5		8	5
	选修 Elective	AUT0041	项目管理 Project Management	32	2			5
	选修 Elective	AUT5251	管理信息系统 Management Information System	32	2			5
	选修 Elective	AUT5161	电子商务 E-Business	32	2			5
	选修 Elective	AUT2061	工程光学 Engineering Optics	40	2.5	8		5
	选修 Elective	AUT2161	误差理论与数据处理 Error and Data Analysis	32	2	8		5
	选修 Elective	AUT5291	光学传感与检测 Optical Sensing and Detection	40	2.5			5
	选修 Elective	AUT5221	工程管理 Engineering Management	32	2			6
	选修 Elective	AUT5051	博弈论 Game Theory	32	2			6
	选修 Elective	AUT2191	信号处理 Digital Signal Processing	48	3		10	6
	选修 Elective	AUT5671	图像处理 Image Processing	32	2			6
	选修 Elective	AUT5911	自动化仪表与执行器 Automation Instrument	32	2			6
	选修 Elective	AUT5881	智能控制 Intelligent Control	32	2			6
	选修 Elective	AUT5151	电气控制基础与可编程控制器 Electric Control and Programmable Logic Controller	40	2.5	12		6
	选修 Elective	AUT6311	工业人工智能技术及应用 Technology and Application of Industrial Artificial Intelligence	32	2			6
	选修 Elective	AUT5781	系统工程 Introduction to System Engineering	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT5351	计算机视觉 Computer Vision	32	2			6
	选修 Elective	AUT5501	人机交互技术 Interaction Technology	32	2			6
	选修 Elective	AUT5691	图像理解与分析 Image Understanding and Analysis	32	2			6
	选修 Elective	AUT5181	动画与游戏设计 Design of Animation and Game	32	2			6
	选修 Elective	AUT5201	飞行器制导控制基础 Basis of Aircraft Guidance Control	32	2			7
	选修 Elective	AUT5331	集散控制系统与组态软件 Distribution Control System and Software	40	2.5			7
	选修 Elective	AUT6191	智能机器人 Intelligent Robotics	24	1.5	8		7
	选修 Elective	AUT5921	最优控制 Optimal Control	32	2			7
	选修 Elective	AUT5471	嵌入式系统原理与应用 Principle and Application of Embedded System	32	2	8		7
	选修 Elective	AUT5871	智能计算（一） Intelligent Computing ( I )	32	2			7
	选修 Elective	AUT6171	虚拟现实技术 Virtual Reality Technology	32	2			7
	选修 Elective	AUT5721	网络安全 Network Security	32	2			7
	选修 Elective	AUT5131	导弹概论 Introduction Missile	16	1			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（3） Engineering Training ( III )	2w	1			1
	必修 Required	ENG3551	工程训练（7） Engineering Training ( VII )	2w	1			3
	必修 Required	AUT3621	生产实习 Engineering Internship	2w	1			6
	必修 Required	AUT0051	C 语言课程设计 C Programming Course Project	3w	1.5			2
	必修 Required	AUT3691	控制理论课程设计 Control Theory Course Project	1w	0.5			5
	必修 Required	AUT3711	控制技术课程设计 Control Technology Course Project	3w	1.5			6
	必修 Required	AUT3751	模式识别与机器学习课程设计 Pattern Recognition and Machine Learning Course Project	3w	1.5			6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Internship and Practical Training	选修 Elective	AUT3552	过程控制系统课程设计 Process Control Course Project	1w	0.5			7
	必修 Required	AUT3661	运动控制系统课程设计 Movement Control System Course Project	3w	1.5			7
	必修 Required	AUT3521	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 自动化第二主修专业培养计划

### Undergraduate Program for the Second Specialty in Automation

#### 一、培养目标

##### I. Educational Objectives

培养具有良好的思想品德和文化修养、专业理论基础宽厚扎实、富于现代科学创新意识，在控制科学与工程领域从事理论研究、科技开发与组织管理的高素质复合型人才。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of controllable science and engineering project.

#### 二、学位

##### II. Degree Conferred

工学学士

Bachelor of Engineering

#### 三、学分

##### III. Credits

完成学业最低学分要求：50

Minimum Course Credits : 50 Credits

其中：

Including：

学科大类基础课程：22.5 学分

Basic Courses in Discipline : 22.5 Credits

专业基础课程：13.5 学分

Common Core Courses in Specialty : 13.5 Credits

专业方向选修课程：不少于 6 学分

Specialty-Oriented Courses : 6 Credits

实践环节：不少于 8 学分

Undergraduate Thesis : 8 Credits

#### 四、教学进程计划表

##### IV. Table of Teaching Schedule

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础课程 Basic Courses in General Discipline	必修 Required	EEE0641	电路理论（三） Circuit Theory (V)	64	4			2
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			3
	必修 Required	EIC0551	电子线路设计、测试与实验（一） Electronic Circuitry Design Test and Experiments	32	1	32		3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in General Discipline 学科大类基础课程	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics （II）	56	3.5			3
	必修 Required	EIC0541	电子线路设计、测试与实验（二） Electronic Circuitry Design Test and Experiments （II）	32	1	32		4
	必修 Required	AUT0562	微机原理 Principle of Microcomputer	56	3.5	16		4
	必修 Required	AUT2222	自动控制原理（一） Control Theory	56	3.5	8		4
	必修 Required	AUT5381	计算机网络 Computer Network	40	2.5			5
Basic Courses in Discipline 学科专业基础课程	必修 Required	AUT0581	数据结构 Data Structure	40	2.5		8	3
	必修 Required	AUT2201	运筹学（一） Operations Research （I）	32	2			4
	必修 Required	AUT0571	信号分析 Signal Analysis	32	2			4
	必修 Required	AUT2241	人工智能导论 Introduction to Artificial Intelligence	32	2			4
	必修 Required	AUT2232	自动控制原理（二） Principle Control of Theory （II）	40	2.5			5
	必修 Required	AUT2271	传感技术 Intelligent Sensor and Detecting	40	2.5	8		5
Electives in Specialty 专业选修课程			专业选修课程 Electives in Specialty	96	6			
	选修 Elective	AUT6301	电机拖动基础 Foundation of Electrical Machinery Driving	48	3			5
	选修 Elective	AUT5792	系统建模 System Model	32	2			5
	选修 Elective	AUT6071	模式识别与机器学习 Pattern Recognition and Machine Learning	32	2			5
	选修 Elective	AUT6291	功率电子技术与运动控制 Power Electronic Technology and Motion Control System	64	4			6
	选修 Elective	AUT5303	过程控制系统 Process Control System	40	2.5			6
	选修 Elective	AUT6261	系统集成与优化 System Integration & Optimization	40	2.5			6
	选修 Elective	AUT5021	DSP 原理与应用 Principle and Application of DSP	32	2	8		6
Internship and Practical Training 实践环节	选修 Elective	AUT3711	控制技术课程设计 Control Technology Course Project	3w	1.5			5
	选修 Elective	AUT3751	模式识别与机器学习课程设计 Pattern Recognition and Machine Learning Course Project	3w	1.5			6
	必修 Required	AUT3521	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 自动化辅修专业培养计划

### Undergraduate Program for Auxiliary Specialty in Automation

#### 一、培养目标

##### I . Educational Objectives

培养具有良好的思想品德和文化修养、专业理论基础宽厚扎实、富于现代科学创新意识，在控制科学与工程领域从事理论研究、科技开发与组织管理的高素质复合型人才。

Aiming at preparing students for good moral character, high quality education, generous and basic specialty theory and modern scientific original consciousness, the program produces comprehensive qualities of students who can go in for theoretical study, scientific development and management in the field of controllable science and engineering project.

#### 二、学分

##### II . Credits

完成学业最低学分要求：25 学分

Minimum Course Credits : 25 credits

其中：

Including：

学科基础课程：15 学分

Basic Courses in Discipline : 15 credits

学科专业课程：10 学分

Courses in Specialty : 10 credits

## 三、教学进程计划表

## III. Table of Teaching Schedule

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in Discipline 学科基础课程	必修 Required	AUT2222	自动控制原理 (一) Control Theory ( I )	56	3.5			4
	必修 Required	AUT2241	人工智能导论 Introduction to Artificial Intelligence	32	2			4
	必修 Required	AUT2271	传感技术 Intelligent Sensor and Detecting	40	2.5	8		5
	必修 Required	AUT6301	电机拖动基础 Foundation of Electrical Machinery Driving	48	3			5
	必修 Required	AUT6291	功率电子技术与运动控制 Power Electronic Technology and Motion Control System	64	4			6
专业选修课程 Electives in Specialty			专业选修课程 Electives in Specialty	160	10			
	选修 Elective	AUT2201	运筹学 (一) Operations Research ( I )	32	2			4
	选修 Elective	AUT5792	系统建模 System Model	32	2			5
	选修 Elective	AUT5021	DSP 原理与应用 Principle and Application of DSP	32	2	8		5
	选修 Elective	AUT5303	过程控制系统 Process Control System	40	2.5			6
	选修 Elective	AUT6261	系统集成与优化 System Integration & Optimization	40	2.5			6
	选修 Elective	AUT6071	模式识别与机器学习 Pattern Recognition and Machine Learning	32	2			6
	选修 Elective	AUT5881	智能控制 Artificial Intelligence Control	32	2			6
	选修 Elective	AUT5121	单片机原理 Principle of Single Chip Microcomputer	32	2	8		7
	选修 Elective	AUT5151	电气控制基础与可编程控制器 Electric control and Programmable Logic Controller	40	2.5	12		7



## 自动化专业卓越计划实验班人才培养计划

### Undergraduate Experimental Program in Automation for Exemplary Engineer Education

#### 一、培养目标

##### I . Program Objectives

培养德智体美劳全面发展，具有系统、扎实的自动化学科理论基础，在自动化系统的信息采集与处理、系统分析、设计与综合及应用等方面具有较宽广的专业知识和实践动手能力的研究型、复合型人才。毕业生具有良好的人文素质、创新精神和较强的英语能力，能在自动化技术产业、科研部门、高等院校等相关领域从事自动化科学技术的研究、设计、开发与管理等方面的工作，并可继续深造攻读相关学科的硕士或博士学位。

This program is designed to provide a thorough grounding in the information collection and processing, the system analysis, design and synthesis and application. It remains committed to systematic education for high-level researchers and doers, who have particular interests in the area of automation. Students with good command of English and personality of innovation can be prepared for any professional roles they might choose, including research, design, integration, practice in automatic industries, research institutes, universities, and other community groups, and pursue their advanced degrees in any related fields.

#### 二、毕业要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有较扎实的数理基础；
2. 掌握工科专业的基本理论和方法；
3. 具有研究解决工科领域理论和实际问题的能力；
4. 具有较强的英语语言能力；
5. 掌握文献检索、资料查询的方法和撰写科学论文的能力；
6. 具有较好的人文社科知识和人文素质，以及较强的协调、组织能力；具有成为行业领军人物的能力；
7. 具有较强的创新精神；
8. 掌握扎实的工程实践基础知识。

Students are expected to gain the following abilities:

1. Solid foundation in both mathematics and physics;
2. Mastery of the basic theories and methods in Engineering;
3. Skills in research and problem solving in Engineering;
4. Mastery of English;
5. Ability to do literature searching, data collection and thesis writing;
6. Attainment in humanities and art, cooperative and organizational skills;
7. Sense of creation and innovation;
8. Accumulate solid and fundamental engineering knowledge and experience.

### 三、培养特色

#### III. Program Highlights

以数理为基础，以自动化学科为平台，以培养工程实践创新能力为重点，强调拔尖研究型人才的良好思想品德和心理素质训练，强调数理基础与专业能力的结合，强调厚积薄发的长线培养模式，具有较强的工程实践和创新能力，培养能从事跨专业乃至跨学科综合研究和高层次技术开发的优秀人才。

Based on mathematics and physics, built on automatic science, centered on the creativeness and the innovation in engineering applications, emphasizing on good moral character and mental qualities, combining grounding in mathematics and physics with professional ability, underlining long-term talent training system, students have abilities of practice and innovation, the program provide talent of inter-discipline or cross subjects research and high level technique developing.

### 四、主干学科

#### IV. Main Disciplines

控制科学与工程

Control Science and Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年制

Length of Schooling: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.8 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training): 160 credits

完成学业最低课外学分要求：6 学分

Minimum Extracurricular Credits: 6 credits

#### 1. 课程体系学时与学分

Hours/Credits of Course System

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	580/31	19
		选修	160/10	5
学科基础课程		必修	984/56.8	30
专业课程	专业核心课程	必修	408/24.5	14
	专业选修课程	主选	288/15.5	8
	专业选修课程	任选	72/4.5	3
集中性实践教育环节		必修/选修	41w/20.5	21
合计			2492+41w/162.8	100
其中，总实验（实践）学时及占比			398+41w/1054/3148	34

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	580/31	19
	Elective	160/10	5

continue

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Basic Courses in Discipline		Required	984/56.8	30
Courses in Specialty	Core Courses in Specialty	Required	408/24.5	14
	Elective Courses in Specialty	Elective	360/21.5	11
Practical Training		Required/Elective	41w/20.5	21
Total			2492+41w/162.8	100
Practicum Credits			398+41w	34

## 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensified Internship and Practical Training

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5
工程训练 (3)	必修	2/1	5
工程训练 (7)	必修	2/1	5
生产实习 (社会实践)	必修	2/1	5
课程设计	必修/选修	17/8.5	41
工程实践 (毕业论文)	必修	16/8	39
合计		41/20.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5
Engineering Training (III)	Required	2/1	5
Engineering Training (VII)	Required	2/1	5
Engineering Internship (Social Practice)	Required	2/1	5
Course Project	Required/Elective	17/8.5	41
Comprehensive Training (Undergraduate Thesis)	Required	16/8	39
Total		41/20.5	100

## 3. 课外学分 (卓越班学生 6 个课外学分中要求包含至少 2 学分的竞赛或论文学分)

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
7	实验	视创新情况	每项	1~3
8	劳动教育（必修）	32 学时		2

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
3	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
4	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
5	Thesis	Those whose thesis appears in national publications	Per piece	2~3
6	Scientific Research	Depending on both the time spent in and ability demonstrated in scientific research project	Each item	1~3
7	Experiments	Depending on innovative extent	Each item	1~3
8	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

## 七、主要课程及创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses

数学类 Mathematics、电路理论 Circuit Theory、模拟电子技术 Analog Electronics Technique、

自动控制原理（一）Control Theory（I）、自动控制原理（二）Control Theory（II）、传感技术 Sensor Technology、计算机控制技术 Computer Control Technology 等。

## 2. 创新创业课程 Innovation（Entrepreneurship）Courses

创新意识启迪类课程：专业概论、科学研究方法

Orientational Innovation（Entrepreneurship）Courses: Introduction to Specialty、Introduction of Science Research.

创新能力培养类课程：微机原理、自动控制原理（一）、自动控制原理（二）

Capacity-building Innovation（Entrepreneurship）Courses: Principle of Microcomputer、Control Theory（I）、Control Theory（II）.

创新实践训练类课程：控制技术课程设计、过程控制系统课程设计、运动控制系统课程设计

Innovative Practice Training Courses: Control Technology Course Project、Process Control Course Project、Movement Control System Course Project.

## 八、主要实践环节

### VIII. Practical Module（experiments Included）

军事训练 Military Training、工程训练 Engineering Training、生产实习 Engineering Internship、课程设计 Course Project、工程实践 Practice in Engineering、毕业设计 Undergraduate Thesis。

## 九、教学进程计划表

### IX. Course schedule

院（系）：人工智能与自动化学院

专业：自动化

School（Department）：School of Artificial Intelligence and Automation

Major: Automation

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Essential-qualities-oriented Education General Courses 素质教育通识课程	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Fundamental English（I）	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Fundamental English（II）	56	3.5			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程，总学分不低于 10 学分（其中经济管理类课程不少于 2 学分，美育类课程不少于 2 学分，《大学生心理健康》必修） General Education Courses (elective)	160	10			2-8
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0551	高等数学（A）上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	高等数学（A）下 Calculus ( I )	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MESE0891	工程制图（一） Engineering Graphics ( I )	40	2.5			1
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments ( II )	24	0.8	24		3
	必修 Required	EEE0641	电路理论（三） Circuit Theory ( III )	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiment	32	1	32		2
	必修 Required	EIC0751	数字电路与逻辑设计 Digital Circuit and Logic Design	56	3.5			3
	必修 Required	EIC0591	模拟电子技术（二） Analog Electronics ( II )	56	3.5			3
	必修 Required	EIC0551	电子线路设计、测试与实验（一） Electronic Circuitry Design Test and Experiments ( I )	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试与实验（二） Electronic Circuitry Design Test and Experiments ( II )	32	1	32		4
	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language ( C )	56	3.5		20	1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in Discipline 学科基础课程	必修 Required	AUT0571	信号分析 Signal Analysis	32	2			4
	必修 Required	AUT0531	计算方法（二） Computational Methods（II）	32	2			4
	必修 Required	AUT2201	运筹学（一） Operational Research（I）	32	2			4
	必修 Required	AUT5381	计算机网络 Computer Network	40	2.5	8		5
Core courses in Specialty 专业核心课程	必修 Required	AUT0582	数据结构 Data Structure	40	2.25		8	3
	必修 Required	AUT0563	微机原理 Principle of Microcomputer	56	3	16		4
	必修 Required	AUT2221	自动控制原理（一） Control Theory（I）	64	4			4
	必修 Required	AUT2231	自动控制原理（二） Control Theory（II）	48	3			5
	必修 Required	AUT2272	传感技术 Sensor Technology	40	2.25	8		5
	必修 Required	AUT2072	计算机控制技术 Computer Control Technology	24	1.5			5
	必修 Required	AUT6301	电机拖动基础 Foundation of Electrical Machinery Driving	48	3			5
	必修 Required	AUT6291	功率电子技术与运动控制 Power Electronic Technology and Motion Control System	64	4			6
	必修 Required	AUT5303	过程控制系统 Process Control System	40	2.5			6
Elective courses in Specialty 专业选修课程			专业限选课程 Selected Electives in Specialty	288	15.5			
	选修 Elective	AUT6321	专业概论（智能中国） Introduction to Specialty	32	2			1
	选修 Elective	AUT6161	文献检索与科技论文写作 Document Retrieval & Scientific Paper Writing	16	1			2
	选修 Elective	AUT6021	工程伦理 Engineering Ethic	32	2			3
	选修 Elective	AUT2242	人工智能导论 Introduction to Artificial Intelligence	40	2.25	8		4
	选修 Elective	AUT2091	控制理论综合实验 Control Theory Experiment	32	1	32		5
	选修 Elective	AUT5792	系统建模 System Model	32	2			5
	选修 Elective	AUT6071	模式识别与机器学习 Pattern Recognition and Machine Learning	32	2			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	二选一 One out of two	AUT5021	DSP 原理与应用 Principle and Application of DSP	32	2	8		6
		AUT5121	单片机原理 Principle of Single Chip Microcomputer	32	1.75	8		6
	选修 Elective	AUT5433	控制技术综合实验 Control Technology Experiment	32	1	32		6
	选修 Elective	AUT6261	系统集成与优化 System Integration & Optimization	40	2.5			6
			专业选修课程 Electives in Specialty	104	6.5			
	选修 Elective	AUT5231	工程实践导论 Introduction of Practical Engineering	32	2			1-7 (校外专家授课)
	选修 Elective	AUT0553	离散数学 Discrete Mathematic	32	2			5
	选修 Elective	AUT6001	Python 语言设计 Python Programming	40	2.5		16	5
	选修 Required	AUT5211	复杂性科学基础 Foundation of Complexity Sciences	32	2			5
	选修 Elective	AUT5451	面向对象的程序设计 Object Orient Program Design	40	2.5		8	5
	选修 Elective	AUT5031	Java 程序设计 Java Programming	40	2.5		16	5
	选修 Elective	AUT5621	数据库技术 Database Technology	32	2			5
	选修 Elective	AUT5311	互联网技术及应用 Internet Technology and Application	32	2		8	5
	选修 Elective	AUT5951	数据科学基础 Foundation of Data Science	32	2			5
	必修 Required	AUT2211	运筹学 (二) Operational Research ( I )	32	2			5
	选修 Elective	AUT5771	系统仿真与 Matlab Matlab System Simulation and Matlab	32	2	4		5
	选修 Elective	AUT5521	软件工程 Software Engineering	24	1.5		8	5
	选修 Elective	AUT0041	项目管理 Project Management	32	2			5
	选修 Elective	AUT5251	管理信息系统 Management Information System	32	2			5
	选修 Elective	AUT5161	电子商务 E-Business	32	2			5
	选修 Elective	AUT2061	工程光学 Engineering Optics	40	2.5	8		5



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT2161	误差理论与数据处理 Error and Data Analysis	32	2	8		5
	选修 Elective	AUT5291	光学传感与检测 Optical Sensing and Detection	40	2.5			5
	选修 Elective	AUT5221	工程管理 Engineering Management	32	2			6
	选修 Elective	AUT5051	博弈论 Game Theory	32	2			6
	选修 Elective	AUT2191	信号处理 Signal Processing	48	3		10	6
	选修 Elective	AUT5671	图像处理 Image Processing	32	2			6
	选修 Elective	AUT5911	自动化仪表与执行器 Automation Instrument	32	2			6
	选修 Elective	AUT5881	智能控制 Intelligent Control	32	2			6
	选修 Elective	AUT5151	电气控制基础与可编程控制器 Electric Control and Programmable Logic Controller	40	2.5	12		6
	选修 Elective	AUT6311	工业人工智能技术及应用 Technology and Application of Industrial Artificial Intelligence	32	2			6
	选修 Elective	AUT5781	系统工程 Introduction to System Engineering	32	2			6
	选修 Elective	AUT5351	计算机视觉 Computer Vision	32	2			6
	选修 Elective	AUT5501	人机交互技术 Interaction Technology	32	2			6
	选修 Elective	AUT5691	图像理解与分析 Image Understanding and Analysis	32	2			6
	选修 Elective	AUT5181	动画与游戏设计 Design of Animation and Game	32	2			6
	选修 Elective	AUT5201	飞行器制导控制基础 Basis of Aircraft Guidance Control	32	2			7
	选修 Elective	AUT5331	集散控制系统与组态软件 Distribution Control System and Software	40	2.5			7
	选修 Elective	AUT6191	智能机器人 Intelligent Robotics	24	1.5	8		7
	选修 Elective	AUT5921	最优控制 Optimal Control	32	2			7
	选修 Elective	AUT5471	嵌入式系统原理与应用 Principle and Application of Embedded System	32	2	8		7
	选修 Elective	AUT5871	智能计算 (一) Intelligent Computing ( I )	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT6171	虚拟现实技术 Virtual Reality Technology	32	2			7
	选修 Elective	AUT5721	网络安全 Network Security	32	2			7
	选修 Elective	AUT5131	导弹概论 Introduction Missile	16	1			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练 (3) Engineering Training (III)	2w	1			1
	必修 Required	ENG3551	工程训练 (7) Engineering Training (VII)	2w	1			2
	必修 Required	AUT3621	生产实习 Engineering Internship	2w	1			6
	必修 Required	AUT3511	C 语言程序设计课程设计 C Programming Course Project	3w	1.5			2
	必修 Required	AUT3691	控制理论课程设计 Control Theory Course Project	1w	0.5			5
	必修 Required	AUT3711	控制技术课程设计 Control Technology Course Project	3w	1.5			5
	必修 Required	AUT3751	模式识别与机器学习课程设计 Pattern Recognition and Machine Learning Course Project	3w	1.5			6
	选修 Elective	AUT3552	过程控制系统课程设计 Process Control Course Project	1w	0.5			7
	必修 Required	AUT3661	运动控制系统课程设计 Movement Control System Course Project	3w	1.5			7
	必修 Required	AUT3671	智能车控制系统课程设计 Course Project for Control System of Smart Car	3w	1.5			7
	必修 Required	AUT3611	企业工程实践/毕业设计 (论文) Enterprise Project / Undergraduate Thesis	16w	8			8

## 智能医学工程专业本科培养计划

### Undergraduate Program for Specialty in Intelligent Medical Engineering

#### 一、培养目标

##### I . Educational Objectives

树立科学的人生观和价值观，具有健全人格和良好职业素质，具有扎实的数理科学，临床医学、医学工程基础知识，掌握人工智能领域坚实的基础理论的专业知识；掌握解决工程问题的先进技术方法和现代技术手段；具有创新意识和独立担负科学技术或工程管理工作的能力；能够快速学习人工智能前沿技术、能够利用人工智能技术解决临床与基础医学实际问题。

This program incorporates a depth of knowledge in mathematics, sciences, clinical medicine and medical engineering fundamentals, as well as essential theoretical knowledge in artificial intelligence. Students are required to learn and apply the state-of-the-art technologies to tackle engineering problems, and be able to undertake scientific projects and engineering management works independently, sometimes in innovative ways. In addition, students are expected to develop a healthy outlook on life and values, strong professional ethics and effective learning strategies, capable of learning advanced AI technologies under time constraints, and use AI technologies to solve clinical and practical problems in basic medicine.

#### 二、毕业要求

##### II . Learning Outcomes

学生掌握计算机，基础医学与临床医学等多学科交叉知识，学生在学习人工智能基本理论的基础上，能够根据视觉、语言、大规模数据之类的在医学上的复杂输入进行决策或者增强人类的能力。毕业生应具备以下素质、知识和能力：

1. 具有较高的人文科学修养、扎实的自然科学基础和工程应用技术的综合素质；
2. 掌握人工智能领域的宽厚理论基础知识和专业知识；
3. 具有良好的工程实践能力和科学研究能力；
- 4 基本掌握相关生物科学、物理学的基本知识和基础医学的理论知识及其研究方法，指导今后的智能医学工程工作实践。
5. 具有临床医学、诊断学的基础理论、基本知识和基本技能，具备良好的思想道德和职业态度。
5. 了解各种常见病、多发病的发病原因、发生机理及诊治原则，具备良好的思想道德和职业态度。
6. 通过临床实践，树立正确的医学伦理观念，尊重每一个人，理解其人文背景及文化价值。

Due to the interdisciplinary nature of the program, students are expected to gain knowledge of computer science, basic medicine, clinical medicine, and, with a mastery of basic AI theory, be able to make decisions or enhance human capabilities based on complex medical inputs in terms of vision, language, and large-scale data. Through the program, students are expected to:

1. become a well-rounded person with adequate immersion in humanities, natural science and engineering application technologies;
2. a solid foundation of AI theory and professional knowledge;
3. show strength in engineering practice and scientific research;

4. acquire knowledge and research methods of physical, life sciences and basic medicine, and apply them in future intelligent medical engineering works;

5. understand the causes, mechanisms and treatments of common and frequently-occurring diseases, possess good morality and professional attitudes;

6. to establish medical ethics during clinical practice, show respect to every individuals, and understand their cultural background and values.

### 三、培养特色

#### III. Program Highlights

以图像处理、计算机视觉为基础，融合脑认知、大数据、云计算、机器学习等人工智能及相关领域工程技术，探索人机协同的智能化诊疗方法和临床应用实践。

This program is based on Computer Vision, Image Processing, integrating artificial intelligence and related engineering technologies such as brain cognition, big data, cloud computing and machine learning. It explores the intelligent diagnosis and treatment supported by human-machine coordination and their clinical applications.

### 四、主干学科

#### IV. Major Disciplines

智能医学工程 Intelligent Medical Engineering

### 五、学制与学位

#### V. Length of Schooling and Degree

修业年限：四年

Duration: 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：165.8 学分

Minimum Credits of Curricular (Comprising course system and intensified internship practical training): 162.8 credits

完成学业最低课外学分要求：5 学分

Minimum Extracurricular Credits: 5 credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	580/31	19
		选修	160/10	5
学科基础课程		必修	688/40.8	22
专业课程	专业核心课程	必修	760/45.25	24
	专业选修课程	专业主选	224/13	7
		专业任选	80/5	2
集中性实践教育环节		必修	41w/19.5	20
合计			2492+41w/165	100
其中，总实验（实践）学时及占比			278+41w/934/3148	30

华中科技大学 2022 级本科专业培养计划

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	580/31	19
		Elective	160/10	5
Basic Courses in Discipline		Required	688/40.8	22
Courses in Specialty	Core Courses in Specialty	Required	760/41.75	16
	Elective Courses in Specialty	Elective	224/13	16
	Elective Courses in Specialty	Elective	80/5	2
Practical Training		Required	41w/19.5	20
Total			2492+41w/165	100
Practicum Credits			278+39w	30

2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5
工程训练 (3)	必修	2/1	5
C 语言程序设计课程设计	必修	3/1.5	7
医学实习	必修	10/5	29
模式识别与机器学习课程设计	必修	3/1.5	7
自主智能系统课程设计	必修	3/1.5	7
毕业设计 (论文)	必修	16/8	40
合计		41/19.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5
Engineering Training	Required	2/1	5
C Programming Course Project	Required	3/1.5	7
Practice of Medicine (Social Practice)	Required	8/4	20
Practice of Image	Required	4/2	9
Course Project of Pattern recognition & Machine Learning	Required	3/1.5	7
Course Project of Autonomous Intelligent System	Required	3/1.5	7
Undergraduate Thesis	Required	16/8	40
Total		41/19.5	100

3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践 (必修)	提交调查报告, 取得成绩		2
3	劳动教育 (必修)	完成劳动教育类课程满 32 学时		2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	国际交流	参与专业学科相关的海外知名高校学术夏令营、暑期学校等 2 周以上, 获得结业证书		1
		参加国内外举办的国际学术会议, 有海报展示或做会议报告		1-2
7	论文	在国内外正式期刊上发表论文	每篇论文	2-3
8	专利	和专业相关并正式获得专利公开号	每项前两名	2-3
9	学术活动	参加学术讲座, 上交学术讲座记录表, 并选取其中感兴趣的一次讲座书写成书面报告, 通过学院认证者		1
10 *	科研	在科研课题组参加科研实践, 通过答辩, 提交课题研究报告	每项 (视参与科研项目、创新实践项目时间、科研能力、科研成果)	1
		完成院级大学生创新创业训练项目		1
		完成校级大学生创新创业训练项目		2
		完成省级、国家级大学生创新创业训练项目		3

注: 1. 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。

2. 标注 \* 的项目为必须完成的项目

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group which is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2 *	Ideological and political course Social Practice	Submitting a report and obtain a passing score		2
3 *	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	325 Points or Higher	3
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
5	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win Third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
6	International Exchange	Taking part in Academic Summer camp or Summer School in famous overseas universities related to discipline for 2 weeks or more, and getting the graduation certificate;		1
		Taking part in international academic conference held at home and abroad, with poster display or make conference report.		1
7	Academic Paper	Published in national-level journals	Each paper	2-3
8	Patent	Officially obtained patent publication number	Each program	2-3
9	Academic Activities	Participate in the Learned Lecture organized by school, submit lecture records and submit report for one lecture; obtain proof of school		1
10 •	Scientific Research	Participated in scientific research practice and passed the defense	Each item (Depending on both the time spent in and ability demonstrated in scientific research project)	1
		Innovation and entrepreneurship training program of school		1
		Innovation and entrepreneurship training program of university/province		2
		Innovation and entrepreneurship training program of nation		3

Note :1. In HUST Sports Meeting, the first and the second prize, the third to the fifth prize and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.

2. “•” shows that the item and requirements must be completed by every student.

## 七、主要课程及创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses in Specialty

计算机组成与嵌入式系统 Computer Organization and Embedded Systems、数据结构与算法分析 Data Structure and Algorithmic Analysis、机器学习 Machine Learning、模式识别 Pattern Recognition、计算机视觉 Computer Vision、分子细胞生物学 Molecules and Cells、物理诊断学 Physical Diagnosis、疾病基础和发病机制 Disease Basis & Pathogenesis、内科学 Internal Medicine、外科学 Surgery 等

#### 2. 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程：专业概论

Orientational Innovation (Entrepreneurship) Courses: Introduction to Specialty.

创新能力培养类课程：人工智能导论、计算机组成与嵌入式系统、机器学习、模式识别

Capacity-building Innovation (Entrepreneurship) Courses: Foundation of AI、Computer Organization and Embedded Systems、Pattern Recognition、Machine Learning.

创新实践训练类课程：自主智能系统课程设计、外科学实习

Innovative Practice Training Courses: Course Projects of Autonomous Intelligent System、Clinical Practice of Surgery.

### 八、主要实践教学环节（含专业实验）

### VIII. Main Internship and Practical Training (Including experiments)

军事训练 Military Training、实习 Clinical Practice、课程设计 Course Project、毕业设计 Undergraduate Thesis

### 九、教学进程计划表

### IX. Table of Teaching Schedule

院（系）：人工智能与自动化学院

专业：智能医学工程

School (Department) : School of Artificial Intelligence and Automation

Major: Intelligent Medical Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Introduction to Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Current Affairs and Policy	48	1.5			5-7
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2		4 (课外)	1
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Fundamental English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Fundamental English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Basic Courses in Discipline	必修 Required	MAT0551	微积分（一）上 Calculus（I）（A）	88	5.5			1
	必修 Required	MAT0531	微积分（一）下 Calculus（I）（B）	88	5.5			2
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	AUT0553	离散数学 Discrete Mathematics	32	2			3
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.8	24		3
	必修 Required	AUT0511	C 语言程序设计 Advanced Programming Language（C）	56	3.5		20	1
	必修 Required	EIC2032	电子器件与电路（一） Electronic Devices and Circuits（I）	80	4.5	16		3
专业核心课程 Core courses in Specialty	必修 Required	AUT2292	数据结构与算法分析 Data Structure and Algorithmic Analysis	64	3.5	16		3
	必修 Required	AUT2242	人工智能导论 Foundation of Artificial Intelligence	40	2.25	8		4
	必修 Required	AUT6282	计算机组成与嵌入式系统 Computer Organization and Embedded Systems	64	3.5	16		4
	必修 Required	BIO5691	分子细胞生物学 Molecules and Cells	56	3.5			5
	必修 Required	CLF0602	物理诊断学 Physical Diagnosis	56	3	16		5
	必修 Required	BIO5301	神经生物学 neuroscience	32	2	8		5
	必修 Required	CLF2213	内科学 Internal Medicine	96	5.75	8		6
	必修 Required	CLF2243	外科学 Surgery	56	3.25	8		6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Core courses in Specialty 专业核心课程	必修 Required	CLF0611	医学影像学 Medical Imaging	32	2			6
	必修 Required	BMS1021	人体形态学 Human morphology	72	4.5	14		5
	必修 Required	AUT0011	人体功能学 Ergonomics	72	4.5			5
	必修 Required	BMS0554	病原生物学 Pathogenic Biology	32	2			5
	必修 Required	CLF0101	疾病基础与发病机制 Disease Basis & Pathogenesis	88	5.5		4	5
专业选修课程 Elective courses in Specialty			专业限选课程 Selected Electives in Specialty	224	13			
	选修 Elective	AUT2101	自动控制原理（一） Control Theory ( I )	56	3.5			4
	选修 Elective	AUT0011	模式识别 Pattern Recognition	48	2.75	8		4
	选修 Elective	AUT0021	机器学习 Machine Learning	40	2.25	8		4
	选修 Elective	AUT5663	数字信号处理 Digital Signal Processing	40	2.25	8		5
	选修 Elective	AUT0031	计算机视觉 Computer Vision	40	2.25	8		6
	选修 Elective	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
			专业选修课程 Electives in Specialty	160	10			
	选修 Elective	AUT6321	专业概论（智能中国） Introduction to Specialty	32	2			1
	选修 Elective	AUT6161	文献检索与科技论文写作 Document Retrieval & Scientific Paper Writing	16	1			2
	选修 Elective	AUT6021	工程伦理（案例讲座） Engineering Ethic	32	2			2
	选修 Elective	AUT6001	Python 语言设计 Python Programming	40	2.5		16	3
	选修 Elective	AUT5451	面向对象的程序设计 Object Orient Program Design	40	2.5		8	3
	选修 Elective	AUT5621	数据库技术 Database Technology	32	2			4
	选修 Elective	AUT5031	Java 程序设计 Java Programming	40	2.5		16	4
	选修 Elective	AUT5951	数据科学基础 Foundation of Data Science	32	2			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Elective courses in Specialty	选修 Elective	AUT2232	自动控制原理（二） Control Theory（II）	40	2.5			5
	选修 Required	AUT6241	自然语言处理 Natural Language Processing	32	2			5
	选修 Elective	AUT5461	嵌入式实时操作系统 Operating System	32	2			5
	选修 Elective	AUT5381	计算机网络 Computer Network	40	2.5	8		5
	选修 Elective	AUT5731	物联网技术 Foundation of Internet of Things	32	2			5
	选修 Elective	BMS0892	生物信息学 Bioinformatics	32	2			5
	选修 Elective	AUT6121	神经网络 Neural Network	32	2			6
	选修 Elective	AUT6011	并行计算 parallel Computing	32	2			6
	选修 Elective	BMS0011	模拟医学 Medical Simulation	32	2			6
	选修 Elective	SSE5081	大数据与云计算 Big Data and Cloud Computing	32	2			6
	选修 Elective	AUT6082	脑与认知科学导论 Introduction to Brain and Cognition Science	32	2	8		6
	选修 Elective	AUT6171	虚拟现实技术 Virtual Reality Technology	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（3） Engineering Training（III）	2w	1			1
	必修 Required	AUT3511	C 语言程序设计课程设计 Course Project for C Programming	3w	1.5			2
	必修 Required	AUT3751	模式识别与机器学习课程设计 Course Project of Pattern Recognition & Machine Learning	3w	1.5			6
	必修 Required	AUT3741	自主智能系统课程设计 Course Project of Autonomous Intelligent System	3w	1.5			7
	必修 Required	CLF3711	内科学见习 Internships in Internal Medicine	6w	2			7
	必修 Required	CLF3811	外科学见习 Clinical Practice of Surgery	4w	2			7
	必修 Required	CLF3781	医学影像学实习 Medical Imaging Intern	2w	1			7
	必修 Required	AUT3521	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 电子信息与通信学院

电子信息与通信学院现有信息与通信工程一级学科（涵盖通信与信息系统、信号与信息处理二个二级学科）和电子科学技术学科中的电磁场与微波技术、电路与系统二个二级学科。拥有通信与信息系统、信号与信息处理、电路与系统、电磁场与微波技术等博士、硕士学位授予权。本院有电子信息工程和通信工程两个本科专业。其中，通信工程专业被列为教育部第一类特色专业和湖北省品牌专业。本院建有 3 门国家级精品课程，在 2001 年、2005 年、2009 年连续三届分别获得全国高等教育教学成果奖二等奖。已经形成了一支包括国家教学名师、全国师德先进个人、宝钢教育基金优秀教师特等奖获得者在内的高水平教师队伍。电工电子教学团队也被评为国家级教学团队。本院拥有国家电工电子实验教学示范中心（电子），信息类数理提高班开办 20 多年，是我校首批开办卓越工程师班的院系，也是本校研究型拔尖创新人才培养的示范区。本院已培养本科、硕士和博士近 15000 人，有中国科学院朱中梁院士和中国工程院罗锡文院士，有全国首批千人计划入选者、中国移动研究院院长黄晓庆，有国内外各领域骨干和精英，毕业生深受众多知名单位欢迎。

本院现建有第一批国家工科电工电子基础课程教学基地（电子）、第一批国家级电工电子实验教学示范中心、武汉光电国家实验室（筹）通信与智能网络研究部、国家防伪工程技术研究中心、下一代互联网接入系统国家工程实验室无线接入和融合接入二个研究室、多谱信息处理技术国防科技重点实验室探测技术研究室、智能互联网技术湖北省重点实验室等多个国家级、省部级教学与研究基地。

## 电子信息工程专业本科培养计划

### Bachelor degree of Engineering (BEng) in Electronics and Information Engineering

#### 一、培养目标

##### I . Program Objective

本专业将培养德、智、体、美、劳全面发展，具有电子信息领域系统、扎实的理论基础，具有工程实践和创新能力的高素质科技人才。

本专业的毕业生将掌握信息科学领域内基础理论知识，获得从信息获取、传递、处理到应用等各方面的基本专业知识，掌握电子电路、信号处理以及多媒体信息处理等方向的基本原理和技术，具有参与设计和开发信息应用系统的工程实践能力。毕业生将具有较强的专业英语能力、良好的人文素质和创新精神，成为能在信息和通信技术产业的科研部门、高等院校从事电子信息系统与工程的设计、集成及开发等工作的研究型或应用型人才。

This program is designed to produce fully-developed engineers in morality, intelligence and health that are trained to develop the fundamental theories and skills, a consolidated knowledge structure, and to be enhanced with hands-on engineering experiences and innovative initiatives in electronics and information engineering.

The graduates in this program are required to develop the systems and technologies which drive the information age, from acquiring information, transmission, processing to application. They are required to master the basic theories and skills in electronic circuits, signal processing and multimedia processing, and they are able to participate in the design and development of various communication and information systems. The graduates are equipped with strong professional English in electronics and information engineering, good personality and innovative initiatives. They are qualified to design, integrate and develop electronics and information systems and technologies in information and communications industries, research institutes, universities and other related communities.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有较扎实的数理基础，具有较强的英语语言能力；
2. 掌握文献检索和撰写科技论文的方法，了解信息学科的发展动态和理论前沿；
3. 理解信息科学的基本理论和方法，具有研究实际问题的能力
4. 掌握信号处理、信息处理系统的原理与技术，具有参与设计和开发的实践能力；
5. 具有较好的人文社科知识和人文素质；
6. 具有较强的团队合作和科技创新精神。

Students are expected to acquire the following knowledge or skills:

1. Consolidated background in both mathematics and physics and strong English capabilities;
2. Skills in searching literatures and writing technical report, and familiar with the development trends in the information discipline and research frontiers;
3. Understanding of basic theories and methods in information science, and research capabilities of

real engineering problems;

4. Mastering principles and technologies in signal processing and information processing systems, and participate in the design and development of information systems;
5. Sound knowledge in humanities-and-art and good personality;
6. Cooperative attitude as a team player and strong innovative initiatives.

### 三、培养特色

#### III. Program Highlights

本专业将以电子电路、信号分析、多媒体处理等信息系统的设计与应用为方向，着重培养学生在电子技术、信号处理等方面的理论基础，培养学生参与多种信息应用系统的设计与开发的工程实践和创新能力。修完本专业课程后，学生也可选择攻读电子科学、通信工程、计算机科学、自动化、光电信息等领域的研究生。

This program focuses on the design and applications of information systems in electronic circuits, signal processing and multimedia processing. Students are required to construct solid and broad theoretical background in electronic technologies and information processing, and they are enhanced with the hands-on engineering experiences and innovative initiatives in the design and development of multiple information systems. Upon graduation, graduates may choose to continue their study at the postgraduate level in electronic science, communication engineering, computer science, automation, optical-electronic and related areas.

### 四、主干学科

#### IV. Main Discipline

信息与通信工程

Information and Communication Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年制

Program Length: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.25 学分。其中，专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Minimum Credits of Curriculum (including courses and intensive practical training/internship) : 162.25 credits

完成学业最低课外学分要求：不少于 5 学分。

Minimum Extracurricular Credits: 5 Credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	644/33.5	20.65
	选修	160/10	6.16
学科基础课程	必修	992/57.25	35.29

华中科技大学 2022 级本科专业培养计划

续表

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
专业课程	专业核心课程	必修	392/23.5	14.48
	专业选修课程	选修	400/25	15.41
集中性实践教学环节		必修	26w/13	8.01
总计			2588+26w/162.25	100
其中, 总实验(实践)学时学分			328+26w/25.0%	

注: 集中性实践教学环节在总学时统计时按每周 16 学时计算。

Course Type		Required/Elective	Hrs/Crs	Percentage (%)
General Education Core Curriculum		Required	644/33.5	20.65
		Elective	160/10	6.16
Discipline-related Courses		Required	992/57.25	35.29
Courses in Major	Major Core Courses	Required	392/23.5	14.48
	Basic Sub-disciplinary Courses	Elective	400/25	15.41
Intensive Engineering Practice		Required	26w/13	8.01
Total			2588+26w/162.25	100
Practicum Credits			328+26w/25.0%	

## 2. 集中性实践教学环节周数与学分

### Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	7.7
工程训练(三)	必修	2w/1	7.7
生产实习	必修	2w/1	7.7
软件课程设计	必修	2w/1	7.7
硬件课程设计	必修	2w/1	7.7
毕业设计(论文)	必修	16w/8	61.5
合计		26w/13	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	7.7
Engineering Training (III)	Required	2w/1	7.7
Engineering Internship	Required	2w/1	7.7
Course Project of Software	Required	2w/1	7.7
Course Project of Hardware	Required	2w/1	7.7
Undergraduate Thesis	Required	16w/8	61.5
Total		26w/13	100

## 3. 课外学分

### Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	思政课社会实践(必修)	提交调查报告, 取得成绩		2
2	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
3	英语水平考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	2
		雅思考试	达 6.5 分以上者	2
		GRE 考试	达 325 分以上者	2
		全国大学生英语口语考试	A、B、C	3、2、1

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
3	计算机水平考试	全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
		大学生创新创业项目	通过	2
7	实验	视创新情况	每项	1~3
8	劳动教育（必修）	32 学时		2

注：“思政课社会实践”（64 学时，2 学分）作为必修环节纳入课外学分管理；“创新创业”要求至少 2 学分，可以通过表中“竞赛”、“论文”、“科研”、“实验”等内容认定。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Qualifications	CET-6	Students whose Band-6 exam scores passed university requirements	2
		TOEFL	Above 90	2
		IELTS	Above 6.5	2
		GRE	Above 325	2
		National College Student Spoken English Test	A、B、C	3、2、1
	Computer Proficiency	National Computer Rank Examination	Holder of the Certificate of Band-2 or higher	2
		National Computer Software Qualification、Proficiency Test	Holder of the Certificate of programmer	2
			Holder of the Certificate of Advanced Programmer	3
			Holder of the Certificate of System Analyst	4
4	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3



continue

No.	Activities	Requirements		Extracurricular Credits
5	Academic papers	Published in National-level Journals	Each Paper	2~3
6	Research Programs	Contribution and Research Capability	Each Program	1~3
7	Experiments	Undergraduate Innovation and Entrepreneurship Project	Pass	2
		Innovation Capacity	Each Experiment	1~3
8	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

电路理论 Circuit Theory、模拟电路与数字系统（一、二、三）Analog Circuit and Digital System (I、II、III)、信号与线性系统 Signal and Linear System、数字信号处理 Digital Signal Processing、通信原理 Principles of Communications、通信电子线路 Electronic Circuits of Communications、基础信息论 Fundamentals of Information Theory、电磁场与电磁波 Electromagnetic Field and Wave、数据结构 Data Structure。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Orientational Innovation (Entrepreneurship) Courses : 信息技术导论 Introduction to Information Technologies

创新能力培养类课程 Capacity-building Innovation (Entrepreneurship) Courses : 硬件课程设计 Project of Hardware

创新实践实训类课程 Innovative Practice Training Courses : 专业方向课程设计 Capstone Project Design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

电子线路设计·测试·实验（一、二）Electronic Circuit Design, Test and Experiments (I、II)、模拟电路与数字系统（三）实验 Experiments of Analog Circuit and Digital System (III)、软件课程设计 Course Project of Software、硬件课程设计 Course Project of Hardware、毕业设计（论文）Undergraduate Thesis.

## 九、教学进程计划表

### IX. Course Schedule

院（系）：电子信息与通信学院

专业：电子信息工程

School (Department) : School of Electronic Information and Communications Major: Electronics and Information Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Laws	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	EIC0011	计算机与程序设计基础（C） Fundamental of Computer Programming ( C )	56	3.5		20	1
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）（上） Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分（一）（下） Calculus ( II )	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments ( II )	24	0.75	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Functions and Integral Transforms	40	2.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	MAT0701	数理方程与特殊函数 Mathematical Equations and Functions	40	2.5			4
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiments	32	1	32		3
	必修 Required	EIC0671	信号与线性系统（二） Signal and Linear System（II）	64	4	16		4
	必修 Required	EIC0582	模拟电路与数字系统（一） Analog Circuit and Digital System（I）	56	3.5			3
	必修 Required	EIC0561	模拟电路与数字系统（二） Analog Circuit and Digital System（II）	48	3			3
	必修 Required	EIC0571	模拟电路与数字系统（三） Analog Circuit and Digital System（III）	48	3			4
	必修 Required	EIC0551	电子线路设计、测试及实验（一） Electronic Circuitry Design, Test and Experiments（I）	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试及实验（二） Electronic Circuitry Design, Test and Experiments（II）	32	1	32		4
	必修 Required	EIC0612	计算机网络 Computer Networks	32	2			5
	必修 Required	EIC5631	信息技术导论 Introduction to Information Technologies	24	1.5			1
专业核心课程 Specialty Core Courses	必修 Required	EIC2081	数据结构 Data Structure	48	3		12	2
	必修 Required	EIC2101	随机过程 Stochastic Process	32	2			4
	必修 Required	EIC2041	模拟电路与数字系统（三）实验 Experiment of Analog Circuit and Digital System（III）	32	1	32		4
	必修 Required	EIC2012	电磁场与电磁波 Electromagnetic Field and Wave	40	2.5			5
	必修 Required	EIC0621	微波技术基础 Fundamentals of Microwave Engineering	56	3.5	8		6
	必修 Required	EIC2053	通信电子线路 Electronic Circuits of Communications	56	3.5	8		5
	必修 Required	EIC2091	数字信号处理 Digital Signal Processing	48	3	8		5
	必修 Required	EIC2072	基础信息论 Fundamentals of Information Theory	24	1.5			4
	必修 Required	EIC2111	通信原理 Principles of Communications	56	3.5	8		5

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			专业公共选修课程 Elective Major Courses					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5451	数据库及应用实践 Database Systems	56	3.5	12		6
	选修 Elective	EIC5021	操作系统 Operating Systems	48	3		8	6
	选修 Elective	EIC5231	ARM 处理器及应用 ARM Processor and Applications	48	3	32		5
	选修 Elective	EIC5241	Altera 可编程片上系统及应用 Altera SOPC and Applications	48	3	32		5
	选修 Elective	EIC5301	Xilinx FPGA 及应用 Xilinx FPGA and Applications	48	3	32		5
	选修 Elective	EIC5281	MSP430 单片机及应用 MSP430 Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5261	Freescale 单片机及应用 Freescale Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5221	8051 系列单片机原理及应用 8051 Microcontroller Principles and Applications	48	3	32		5
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5731	嵌入式 Linux 软件设计 Embedded Linux Software Design	48	3	32		6
	选修 Elective	EIC5641	虚拟仪器技术及应用 Virtual Instrumentation and Applications	32	2			6
	选修 Elective	EIC5031	传感器技术及应用 Sensor Technology and Applications	32	2			6
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5671	医学图像处理 Medical Image Processing	32	2	8		7
	选修 Elective	EIC5681	应用密码学 Applied Cryptography	32	2			7
	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5411	绿色通信技术导论 Introduction to Green Communications	32	2			6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC6011	天线 Antenna	32	2			5
	选修 Elective	EIC6021	电波传播 Radio Wave Propagation	32	2			6
	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5011	Python 编程技术 Python Programming	32	2			5
	选修 Elective	OEI2271	微电子器件与 IC 设计 (一) Electronic Device Basics and IC Design ( I )	56	3.5			6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
			专业方向选修课程 Elective Major Courses					
			信息 1 : 多媒体信息处理方向 (Multimedia Information Processing)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5111	多媒体技术与应用 Multimedia Technology and Application	40	2.5		16	6
	选修 Elective	EIC5511	数字语音处理 Digital Speech Processing	32	2		8	6
	选修 Elective	EIC5441	视频处理与通信 Video Processing and Communications	40	2.5		8	7
	选修 Elective	EIC5101	多媒体技术课程设计 Capstone Project in Multimedia Technologies	80	5		32	7
			信息 2 : 大数据处理方向 (Big Data Processing)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5051	大数据技术原理与应用 Principles and Applications of Big Data Technology	56	3.5		8	6
	选修 Elective	EIC5471	数据挖掘 Data Mining	48	3		8	6
	选修 Elective	EIC5041	大数据处理系统设计与实现 Capstone Project in Big Data Processing Systems	56	3.5		44	7

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			信息 3 : 网络应用方向 (Network Applications)					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5081	电子商务概论 Introduction to Electronic Commerce	32	2			6
	选修 Elective	EIC5381	计算机网络实验 Computer Network Labs	32	2	24		6
	选修 Elective	EIC5291	网络科学 Network Science	32	2			7
	选修 Elective	EIC5341	互联网应用系统设计与实验 Capstone Project in Internet Application Systems	80	5	16		7
			信息 4 : 智能电路系统方向 (Intelligent Circuit Systems)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5141	机电控制技术 Electromechanical Control Technologies	64	4	32		6
	选修 Elective	EIC5721	智能硬件系统设计 Intelligent Hardware System Design	64	4	48		7
	选修 Elective	EIC5711	智能机器人设计 Intelligent Robot Design	64	4			7
			信息 5 : 数字信号处理方向 (Digital Signal Processing)					
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5501	数字信号系统设计与实现 Capsonte Project in Digital Signal Processing systems	96	6	64		6
	选修 Elective	EIC5691	阵列信号处理 Array Signal Processing	32	2	4		6
	选修 Elective	EIC5491	数字信号处理平台高级程序设计 Advanced Programming for Digital Signal Processing Platforms	32	2	16		7
	选修 Elective	EIC5601	现代数字信号处理 Advanced Digital Signal Processing	32	2	8		7
			信息 6 : 机器智能方向 (Machine Intelligence)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
	选修 Elective	EIC6041	多媒体检索 Multimedia Retrieval	40	2.5		8	7
	选修 Elective	EIC6061	机器智能课程设计 Capstone Project in Machine Intelligence	80	5		32	7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（三） Engineering Training（III）	2w	1			4
	必修 Required	EIC3531	软件课程设计 Course Project of Software	2w	1			5
	必修 Required	EIC3551	硬件课程设计 Course Project of Hardware	2w	1			6
	必修 Required	EIC3542	生产实习 Enterprise Internship	2w	1			6
	必修 Required	EIC3511	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 通信工程专业本科培养计划

### Bachelor degree of Engineering (BEng) in Telecommunication Engineering

#### 一、培养目标

##### I . Program Objective

本专业将面向通信领域科技前沿、面向移动通信产业主战场、面向国家重大信息技术需求，培养适应社会主义现代化建设和信息产业发展需要，践行社会主义核心价值观的高素质德、智、体、美、劳全面发展的专门人才，培养学生在通信工程领域具备扎实的理论基础、工程知识、专业技术的实践能力和创新创业能力，包括从信息获取、分析、存储、传输、处理到应用等各方面的基本专业知识，及通信系统、通信网络的基本原理和技术，特别是能够在通信工程及相关信息科学领域的高等院校进一步深造从事科学技术研究，或者在信息技术产业从事系统、器件、协议和算法的研究、设计、开发、制造、应用、维护、管理等工作，并具备一定人文社会科学素养与国际化视野。学生毕业五年左右能获得硕士研究生学位或者达到工程师等中级技术职称任职条件，具体应达到的目标如下：

- (1) 具有健全的人格和良好科学文化素养，具有职业道德和社会责任感。
- (2) 具有国际化视野和跨文化交流与合作能力，具有团队分工协作、交流沟通的能力，能胜任技术负责、经营与管理等工作。
- (3) 理解科学技术的发展与伦理道德问题，并能够根据国家法律、行业法规及相关技术标准，合理运用所学专业知识和分析、解决通信工程及相关行业领域内遇到的工程实践问题。
- (4) 能够独立承担通信工程及相关领域中基础研究，通信系统、器件、协议和算法的设计、应用研究和科技开发工作，攻读博士研究生学位或成为所在单位技术骨干。
- (5) 具有终身学习的能力，能够通过继续教育或其它学习渠道更新知识，实现能力和技术水平的提高，具备不断适应社会发展和行业竞争的能力。

This program is designed to produce fully-developed engineers in morality, intelligence and health to meet the research demand of the frontiers of science and technology in telecommunications engineering, the development demand of mobile communication industry, and the national major information technology development demand. The students are trained to develop the fundamental theories and skills, a consolidated knowledge structure, and to be enhanced with hands-on engineering experiences and innovative initiatives in telecommunication engineering, including basic professional knowledge from information acquisition, analysis, storage, transmission, processing to application, as well as telecommunication systems and networks. The students are able to continue further study in telecommunication engineering and related information science in higher education, or conduct research, design, development, manufacture, apply, maintain and manage telecommunication systems, devices, protocols, and algorithms in the information industry. The students acquire qualified humanities and social science literacy in an international perspective. The graduates are able to obtain a master's degree or meet the engineer qualifications for intermediate technical certificates in about five years after graduation. The program goals should be achieved as follows:

- (1) Acquire a sound personality, good scientific and cultural literacy, professional ethics and a sense of social responsibility.



(2) Acquire an international perspective and cross-cultural communication and cooperation capabilities, and be able to work in a team division and collaboration, communication and communication, and be competent in technical responsibility, operation and management, etc.

(3) Understand the development of science and technology and ethical issues, and be able to reasonably use the professional knowledge learned to analyze and solve engineering practice problems encountered in telecommunication engineering and related industries in accordance with national laws, industry regulations and related technical standards.

(4) Be able to independently undertake basic research in telecommunication engineering and related fields, or be able to design, application research and technological development of telecommunication systems, devices, protocols and algorithms. Conduct further study for a doctoral degree or become a key engineer or manager of the unit.

(5) Be able to conduct lifelong learning, be able to update knowledge through continuing education or other learning channels to improve personal ability and technical level, and continuously adapt to social development and industry competition.

## 二、基本规格要求

### II. Learning Outcomes

毕业生应获得以下 12 个方面的知识、能力和态度:

1. 工程知识: 能够将数学、自然科学、工程基础和专业知识用于解决通信工程领域的复杂工程问题。

2. 问题分析: 能够将数学、自然科学和工程科学的基本原理综合运用于通信工程专业复杂工程问题的分析、识别、表达、处理, 并通过查阅、检索、分析文献研究分析通信工程领域的复杂工程问题, 以获得有效结论。

3. 设计(开发)解决方案: 能够设计(开发)满足通信工程特定需求的系统、器件、协议和算法或者解决方案, 并在设计环节中考虑社会、健康、安全、法律、文化以及环境等因素, 在提出通信工程复杂工程问题的解决方案时具有创新意识。

4. 研究: 能够基于科学原理、采用科学方法对通信工程专业的复杂工程问题进行研究, 包括设计实验、收集、处理、分析与解释数据, 通过信息综合得到合理有效的结论并应用于工程实践。

5. 使用现代工具: 能够针对通信工程领域的复杂工程问题, 开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具, 包括对通信工程领域复杂工程问题的预测与模拟, 并能够理解其局限性。

6. 工程与社会: 能够基于通信工程专业相关的背景知识和标准, 评价通信工程项目的设计、施工和运行的方案, 以及复杂工程问题的解决方案, 包括其对社会、健康、安全、法律以及文化的影响, 并理解因方案实施可能会产生的后果及应承担的责任。

7. 环境和可持续发展: 能够理解和评价针对通信工程专业的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: 了解中国国情、具有人文社会科学素养、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行为规范, 做到责任担当、贡献国家、服务社会。

9. 个人和团队: 在解决通信工程领域的复杂工程问题时, 能够在多学科组成的团队中承担个体、团队成员或负责人的角色。

10. 沟通: 能够就通信工程领域的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、表达或回应指令。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: 在与通信工程专业相关的多学科环境中理解、掌握、应用工程管理原理与经济决策方法。

12. 终身学习：具有自主学习和终身学习的意识，具有提高自主学习和适应通信工程新发展的能力。

Students are expected to acquire the following knowledge, skills or attitudes:

1. Engineering knowledge: be able to apply mathematics, natural sciences, engineering foundations and professional knowledge to solve complex engineering problems in the field of telecommunication engineering.

2. Problem analysis: be able to apply the basic principles of mathematics, natural science and engineering science to analyze, identify, present, and process complex engineering problems in telecommunication engineering, and conduct literature search to analyze the complex telecommunication engineering problems to draw effective conclusions.

3. Design and implement solutions: be able to design and implement systems, devices, protocols and algorithms or solutions that meet the specific needs of telecommunication engineering, considering social, health, safety, legal, cultural and environmental factors in the design process, and propose solutions to complex telecommunication engineering problems with innovative ideas.

4. Research: be able to conduct research on complex telecommunication engineering problems based on scientific principles and scientific methods, including designing experiments, collecting, processing, analyzing and interpreting data, and drawing logical and effective conclusions based on information synthesis and applying them to engineering practice.

5. Use modern tools: be able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools to solve complex telecommunication engineering problems, including the prediction and simulation of complex telecommunication engineering problems, and be able to understand its limitations.

6. Engineering and society: based on the background knowledge and standards of telecommunication engineering, be able to evaluate the design, construction and operation of telecommunication engineering projects, as well as the solutions to complex telecommunication engineering problems, including its impact on society, health, safety, law, and The influence of culture, and understand the possible consequences and responsibilities due to the implementation of the plan.

7. Environment and sustainable development: able to understand and evaluate the impact of engineering practice on the environment and the sustainable development of society for the complex telecommunication engineering problems.

8. Professional ethics: understand China's national conditions, acquire humanities and social science literacy, and social responsibility, be able to understand and abide by engineering professional ethics and codes of conduct in telecommunication engineering practice, and fulfill responsibility, contribute to the country, and serve the society.

9. Individual and team work: when solving complex telecommunication engineering problems, be able to play the roles of individuals, team members or leaders in a multi-disciplinary team.

10. Communication: able to effectively present and communicate with industry peers and the public on complex telecommunication engineering issues, including writing reports and design manuscripts, making statements, presenting or responding to instructions. Be able to present and communicate in cross-cultural environments with an international perspective.

11. Project management: understand, master, and apply engineering management principles and economic decision-making methods in a multidisciplinary environment in telecommunication engineering.

12. Lifelong learning: acquire the consciousness of independent learning and lifelong learning, and

be able to improve independent learning and adapt to the new development of telecommunication engineering.

### 三、培养特色

#### III. Program Highlights

专业将以移动通信、空间通信、通信网络等通信系统的设计与应用为方向，着重培养学生在电子信息技术、通信技术等方面的理论基础，培养学生参与多种通信系统的设计与开发的工程实践和创新能力。修完本专业课程后，学生也可选择攻读通信工程、电子信息工程、电子工程、计算机科学、自动化、光电信息等领域的研究生。

This program focuses on the design and applications of information systems in wireless communications, space communications and communication networks. Students are required to construct solid and broad theoretical background in electronics and communications, and they are enhanced with the hands-on engineering experiences and innovative initiatives in the design and development of multiple communication systems. Upon graduation, graduates may choose to continue their study at the postgraduate level in telecommunication engineering, electronic information engineering, electronic engineering, computer science, automation, optical-electronic and related areas.

### 四、主干学科

#### IV. Main Discipline

信息与通信工程

Information and Communication Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年制

Program Length: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.25 学分。其中，专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Minimum Credits of Curriculum (including courses and intensive practical training/internship) : 162.25 credits

完成学业最低课外学分要求：不少于 5 学分。

Minimum Extracurricular Credits: 5 Credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	644/33.5	20.65
		选修	160/10	6.16
学科基础课程		必修	992/57.25	35.29
专业课程	专业核心课程	必修	392/23.5	14.48
	专业选修课程	选修	400/25	15.41

续表

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
集中性实践教学环节	必修	26w/13	8.01
总计		2588+26w/162.25	100
其中, 实验(实践)总学时及占比		328+26w	25.0

注: 集中性实践教学环节在总学时统计时按每周 16 学时计算。

Course Type	Required/Elective	Hrs/Crs	Percentage (%)
General Education Core Curriculum	Required	644/33.5	20.65
	Elective	160/10	6.16
Discipline-related Courses	Required	992/57.25	35.29
Courses in Major	Major Core Courses	392/23.5	14.48
	Basic Sub-disciplinary Courses	400/25	15.41
Intensive Engineering Practice	Required	26w/13	8.01
Total		2588+26w/162.25	100
Practicum Credits		328+26w	25.0

## 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	7.7
工程训练	必修	2w/1	7.7
生产实习	必修	2w/1	7.7
软件课程设计	必修	2w/1	7.7
硬件课程设计	必修	2w/1	7.7
毕业设计(论文)	必修	16w/8	61.5
合计		26w/13	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	7.7
Engineering Training	Required	2w/1	7.7
Engineering Internship	Required	2w/1	7.7
Course Project of Software	Required	2w/1	7.7
Course Project of Hardware	Required	2w/1	7.7
Undergraduate Thesis	Required	16w/8	61.5
Total		26w/13	100

## 3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	思政课社会实践(必修)	提交调查报告, 取得成绩	2
2	社会实践活动	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
3	英语水平考试	全国大学英语六级考试	获六级证书者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
		全国大学生英语口语考试	A、B、C
	计算机水平考试	全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
		大学生创新创业项目	通过	2
7	实验	视创新情况	每项	1~3
8	劳动教育（必修）	32 学时		2

注：“思政课社会实践”（64 学时，2 学分）作为必修环节纳入课外学分管理；“创新创业”要求至少 2 学分，可以通过表中“竞赛”、“论文”、“科研”、“实验”等内容认定。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Qualifications	CET-6	Students whose Band-6 exam scores passed university requirements	2
		TOEFL	Above 90	2
		IELTS	Above 6.5	2
		GRE	Above 325	2
		National College Student Spoken English Test	A、B、C	3、2、1
	Computer Proficiency	National Computer Rank Examination	Holder of the Certificate of Band-2 or higher	2
		National Computer Software Qualification、Proficiency Test	Holder of the Certificate of programmer	2
			Holder of the Certificate of Advanced Programmer	3
4	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
5	Academic papers	Published in National-level Journals	Each Paper	2~3
6	Research Programs	Contribution and Research Capability	Each Program	1~3
		Undergraduate Innovation and Entrepreneurship Project	Pass	2
7	Experiments	Innovation Capacity	Each Experiment	1~3
8	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、模拟电路与数字系统（一、二、三）Analog Circuit and Digital System (I、II、III)、信号与线性系统 Signal and Linear System、数字信号处理 Digital Signal Processing、通信原理 Principles of Communications、通信电子线路 Electronic Circuits of Communications、基础信息论 Fundamentals of Information Theory、电磁场与电磁波 Electromagnetic Field and Wave、数据结构 Data Structure。

#### （二）创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Orientational Innovation (Entrepreneurship) Courses : 信息技术导论 Introduction to Information Technologies

创新能力培养类课程 Capacity-building Innovation (Entrepreneurship) Courses : 硬件课程设计 Project of Hardware

创新实践实训类课程 Innovative Practice Training Courses : 专业方向课程设计 Capstone Project Design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

电子线路设计·测试·实验（一、二）Electronic Circuit Design, Test and Experiments (I、II)、模拟电路与数字系统（三）实验 Experiments of Analog Circuit and Digital System (III)、软件课程设计 Course Project of Software、硬件课程设计 Course Project of Hardware、毕业设计（论文）Undergraduate Thesis

## 九、教学进程计划表

### IX. Course Schedule

院（系）：电子信息与通信学院

专业：通信工程

School (Department) : School of Electronic Information and Communications

Major: Telecommunication Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Laws	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Essential-qualities-oriented Education General Courses 素质教育通识课程	必修 Required	SFL0001	综合英语（一） Comprehensive English（I）	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English（II）	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education（I）	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education（II）	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education（III）	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	EIC0011	计算机与程序设计基础（C） Fundamental of Computer Programming（C）	56	3.5		20	1
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）（上） Calculus（I）	88	5.5			1
	必修 Required	MAT0531	微积分（一）（下） Calculus（II）	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.75	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Functions and Integral Transforms	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Mathematical Equations and Functions	40	2.5			4
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	EIC5631	信息技术导论 Introduction to Information Technologies	24	1.5			1
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiments	32	1	32		3
	必修 Required	EIC0551	电子线路设计、测试及实验（一） Electronic Circuitry Design, Test and Experiments ( I )	32	1	32		3
	必修 Required	EIC0582	模拟电路与数字系统（一） Analog Circuit and Digital System ( I )	56	3.5			3
	必修 Required	EIC0561	模拟电路与数字系统（二） Analog Circuit and Digital System ( II )	48	3			3
	必修 Required	EIC0571	模拟电路与数字系统（三） Analog Circuit and Digital System ( III )	48	3			4
	必修 Required	EIC0671	信号与线性系统（二） Signal and Linear System ( II )	64	4	8		4
	必修 Required	EIC0541	电子线路设计、测试及实验（二） Electronic Circuitry Design, Test and Experiments ( II )	32	1	32		4
	必修 Required	EIC0612	计算机网络 Computer Networks	32	2			5
专业核心课程 Specialty Core Courses	必修 Required	EIC2081	数据结构 Data Structure	48	3		12	2
	必修 Required	EIC2101	随机过程 Stochastic Process	32	2			4
	必修 Required	EIC2041	模拟电路与数字系统（三）实验 Experiment of Analog Circuit and Digital System( III )	32	1	32		4
	必修 Required	EIC2072	基础信息论 Fundamentals of Information Theory	24	1.5			4
	必修 Required	EIC2012	电磁场与电磁波 Electromagnetic Field and Wave	40	2.5			5
	必修 Required	EIC2053	通信电子线路 Electronic Circuits of Communications	56	3.5	8		5
	必修 Required	EIC2091	数字信号处理 Digital Signal Processing	48	3	8		5
	必修 Required	EIC2111	通信原理 Principles of Communications	56	3.5	8		5
	必修 Required	EIC0621	微波技术基础 Fundamentals of Microwave Engineering	56	3.5	8		6
专业选修课程 Specialty-oriented Courses			专业公共选修课程 Elective Major Courses					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5231	ARM 处理器及应用 ARM Processor and Applications	48	3	32		5
	选修 Elective	EIC5241	Altera 可编程片上系统及应用 Altera SOC and Applications	48	3	32		5



续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5301	Xilinx FPGA 及应用 Xilinx FPGA and Applications	48	3	32		5
	选修 Elective	EIC5261	Freescle 单片机及应用 Freescle Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5221	8051 系列单片机原理及应用 8051 Microcontroller Principles and Applications	48	3	32		5
	选修 Elective	EIC6011	天线 Antenna	32	2			5
	选修 Elective	EIC6021	电波传播 Radio Wave Propagation	32	2			6
	选修 Elective	EIC5011	Python 编程技术 Python Programming	32	2			5
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
	选修 Elective	EIC5451	数据库及应用实践 Database Systems	56	3.5	12		6
	选修 Elective	EIC5021	操作系统 Operating Systems	48	3		8	6
	选修 Elective	EIC5281	MSP430 单片机及应用 MSP430 Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5731	嵌入式 Linux 软件设计 Embedded Linux Software Design	48	3	32		6
	选修 Elective	EIC5641	虚拟仪器技术及应用 Virtual Instrumentation and Applications	32	2			6
	选修 Elective	EIC5031	传感器技术及应用 Sensor Technology and Applications	32	2			6
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5411	绿色通信技术导论 Introduction to Green Communications	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC5671	医学图像处理 Medical Image Processing	32	2	8		7
	选修 Elective	EIC5681	应用密码学 Applied Cryptography	32	2			7
	选修 Elective	EIC5831	无线通信系统设计和实验 Capstone Project in Wireless Communication Systems	80	5	60		7
	选修 Elective	OEI2271	微电子器件与 IC 设计 (一) Electronic Device Basics and IC Design ( I )	56	3.5			6
			专业方向选修课程 Elective Major Courses					
			通信 1 : 通信网络方向 (Communication Networks)					
	选修 Elective	EIC5381	计算机网络实验 Computer Network Labs	32	2	24		6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC5801	网络系统设计和实验 Capstone Project in Network Systems	80	5	60		7
			通信 2 : 移动通信方向 (Mobile Communications)					
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5192	移动通信网络 Mobile Communication Networks	48	3	16		7
	选修 Elective	EIC5532	通信编码理论 Communication Coding Theory	48	3	16		7
	选修 Elective	EIC5202	移动通信系统设计和实验 Capstone Project in Mobile Communication Systems	80	5	60		7
			通信 3 : 空间通信方向 (Space Communications)					
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5171	卫星通信原理 Principles of Satellite Communications	48	3	16		6
	选修 Elective	EIC5092	定位与导航技术 Location and Navigation Technologies	48	3	16		7
	选修 Elective	EIC5811	卫星通信系统 Satellite Communication Systems	32	2			7
	选修 Elective	EIC5391	空间通信系统设计和实验 Capstone Project in Space Communication Systems	80	5	60		7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（三） Engineering Training (III)	2w	1			4
	必修 Required	EIC3542	生产实习 Engineering Internship	2w	1			6
	必修 Required	EIC3531	软件课程设计 Course Project of Software	2w	1			5
	必修 Required	EIC3551	硬件课程设计 Course Project of Hardware	2w	1			6
	必修 Required	EIC3511	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 电磁场与无线技术专业本科培养计划

### Bachelor degree of Engineering (BEng) in Electromagnetic Field and Wireless Technology

#### 一、培养目标

##### I . Program Objective

本专业将培养德、智、体、美、劳全面发展，具有电磁场与无线技术领域系统和扎实的理论基础，具有工程实践和创新能力的高素质科技人才。

本专业培养数理基础扎实，专业英语能力强，创新能力突出，系统掌握电磁场理论、天线与电波传播、射频电路与系统、无线与移动通信、目标探测信号与信息处理、高性能软件无线电、电子对抗等基础理论与技术，在信号获取、信息感知与处理、场与路的系统级应用等方面具有综合能力的应用研究型人才。本专业毕业生将能在信息和通信技术产业的科研部门、高等院校从事有关电磁场与无线技术的开发与应用研究，涵盖航空、航天、航海、雷达、电子对抗、遥控遥测、电子元器件、地球遥感与深空、资源探测等领域。

This program is designed to produce fully-developed engineers in morality, intelligence and health that are trained to develop the fundamental theories and skills, a consolidated knowledge structure, and to be enhanced with hands-on engineering experiences and innovative initiatives in electromagnetic field and wireless technology.

The graduates in this program are required to develop consolidated mathematical and physical foundation, strong professional English capability and distinctive innovative initiatives. They are required to systematically master the basic theories and skills in the Electromagnetic Field Theory, Antenna and Radio Wave Propagation, RF Circuit and System, Wireless and Mobile Communication, Target Detection Signal and Information Processing, High-performance Software Radio and Electronic Countermeasures (ECM). The graduates are equipped with comprehensive application-oriented research capability in signal acquisition, information perception and processing, and system level applications of fields and circuits. In information and communications industries, research institutes, universities and other related communities, our graduates will be qualified to conduct the research and development in electromagnetic fields and wireless technology, including aviation, spaceflight, navigation, radar, electronic countermeasures, remote control, remote sensing, electronic components, the earth and deep space, resources remote sensing detection, etc.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下 12 个方面的知识、能力和态度：

1. 工程知识：具备从事电磁场与无线技术工作所需的数学、自然科学、工程基础和专业知识，能够将它们用于解决电磁场与无线技术领域复杂问题。
2. 问题分析：能够运用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析电磁场与无线技术相关的复杂工程问题，以获得有效结论。
3. 设计/开发解决方案：能够设计针对电磁场与无线技术相关的复杂工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识，考虑

社会、健康、安全、法律、文化以及环境等因素。

4. 研究：能够基于科学原理并采用科学方法对复杂电磁场与无线技术问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到科学有效的结论。

5. 使用现代工具：能够针对电磁场与无线技术相关的复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。

6. 工程与社会：能够基于电磁场与无线技术相关的工程背景知识进行综合分析，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。

7. 环境和可持续发展：能够理解和评价针对电磁场与无线技术相关的复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

8. 职业规范：具有良好的工程职业道德、爱国敬业精神、丰富的人文科学素养和社会责任感，追求卓越，能够在电磁场与无线技术实践中理解并遵守学术道德、工程职业道德和规范，履行责任。

9. 个人与团队：能够在多学科背景下的团队中承担合适的个体、团队成员以及负责人的角色。

10. 沟通：能够就电磁场与无线技术相关的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：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

Students are expected to acquire the following knowledge, skills or attitudes:

1. Engineering knowledge: mathematics, natural science, engineering and the domain knowledge to solve the complex problems in electromagnetic field and wireless technology.

2. Problem analysis : Be able to apply the basic principles of mathematics, natural sciences, engineering and the domain knowledge to identify, express, and analyze complex engineering problems in electromagnetic field and wireless technology based on literature research to draw effective conclusions.

3. Design/development of solutions: Be able to propose solutions to complex engineering problems in electromagnetic field and wireless technology, to design systems, units (components) or technical processes that meet specific needs, and be able to demonstrate innovation in the design process, considering society, health, safety, law, culture, and environmental factors.

4. Research: Be able to study complex electromagnetic field and wireless technology problems based on scientific principles and applying scientific methods, including designing experiments, analyzing and interpreting data, and drawing scientific and effective conclusions based on information synthesis.

5. Modern engineering tools: Be able to develop, select and apply appropriate technologies, resources, modern engineering tools and information technology tools for complex engineering problems in electromagnetic field and wireless technology, including the prediction and simulation of complex telecommunication problems, and understand their limitations.

6. Engineering and society: Be able to conduct comprehensive analysis based on the engineering background knowledge in electromagnetic field and wireless technology, evaluate the impact of professional engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibilities that should be undertaken.

7. Environment and sustainable development: Be able to understand and evaluate the impact of professional engineering practice on the environment and the sustainable development of society for complex engineering problems in electromagnetic field and wireless technology.

8. Professional norms: Acquire good engineering professional ethics, patriotic dedication, rich humanities and social responsibility, pursue excellence, and be able to understand and abide by academic ethics, engineering professional ethics and norms in electromagnetic field and wireless technology practice, and perform responsibilities.

9. Individuals and teams: Be able to play the appropriate roles of individuals, team members and leaders in a team with a multidisciplinary background.

10. Communication: Be able to effectively communicate with professional colleagues and the public on complex engineering issues in electromagnetic field and wireless technology, including writing reports and design manuscripts, making statements, expressing clearly or responding to instructions. Acquire a certain international perspective, and be able to communicate and exchange in a cross-cultural context.

11. Projects Management: Understand and master engineering management principles and economic decision-making methods, and be able to apply them in a multi-disciplinary environment.

12. Acquire consciousness of independent learning and lifelong learning, and be able to continuously learn and adapt to development.

### 三、培养特色

#### III. Program Highlights

本专业是电磁场电磁波与通信技术的交叉学科，是经教育部批准设立的电子信息类国家级特设专业，是学校的特色学科之一，也是国家建设急需专业。本专业重视电磁场的基本理论和无线技术的实践能力，坚持理工结合，按电磁场与无线技术设置专业选修课程，培养学生的综合分析思维能力，着眼全面提高学生的综合素质。

This program is an interdisciplinary major between electromagnetic fields/ waves and communication technology, which is established as a national special major of electronic information with the approval of the ministry. It is not only one of the special disciplines of our university, but also it is an urgent needed major for state construction. This major focuses on both science and engineering by emphasizing the basic theory of electromagnetic field and hands-on skills of wireless technology. We design the specialized elective major courses in electromagnetic fields and wireless technology. The goal is to develop students' comprehensive analytical thinking ability, and to improve the overall quality of students.

### 四、主干学科

#### IV. Major Discipline

电子科学与技术

Electronic Science and Technology

### 五、学制与学位

#### V. Program Length and Degree

学制：四年制

Program Length: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：162.75 学分。其中，专

业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Minimum Credits of Curriculum (including courses and intensive practical training/internship) : 162.75 credits

完成学业最低课外学分要求：不少于 5 学分。

Minimum Extracurricular Credits: 5 Credits

### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	644/33.5	20.58
		选修	160/10	6.14
学科基础课程		必修	992/57.25	35.18
专业 课程	专业核心课程	必修	400/24	14.75
	专业选修课程	选修	400/25	15.36
集中性实践教学环节		必修	26w/13	7.99
总计			2596+26w/162.75	100
其中，实验（实践）总学时及占比			328+26w	25.0

Course Type		Required/Elective	Hrs/Crs	Percentage (%)
General Education Core Curriculum		Required	644/33.5	20.58
		Elective	160/10	6.14
Discipline-related Courses		Required	992/57.25	35.18
Courses in Major	Major Core Courses	Required	400/24	14.75
	Basic Sub-disciplinary Courses	Elective	400/25	15.36
Intensive Engineering Practice		Required	26w/13	7.99
Total			2596+26w/162.75	100
Practicum Credits			328+26w	25.0

### 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	7.7
工程训练	必修	2w/1	7.7
生产实习	必修	2w/1	7.7
软件课程设计	必修	2w/1	7.7
硬件课程设计	必修	2w/1	7.7
毕业设计（论文）	必修	16w/8	61.5
合计		26w/13	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	7.7
Engineering Training	Required	2w/1	7.7
Engineering Internship	Required	2w/1	7.7
Course Project of Software	Required	2w/1	7.7
Course Project of Hardware	Required	2w/1	7.7
Undergraduate Thesis	Required	16w/8	61.5
Total		26w/13	100

### 3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	思政课社会实践（必修）	提交调查报告，取得成绩	2
2	社会实践活动	提交社会调查报告，通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者	2

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
3	英语水平考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	2
		雅思考试	达 6.5 分以上者	2
		GRE 考试	达 325 分以上者	2
		全国大学生英语口语考试	A、B、C	3、2、1
4	计算机水平考试	全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文	在全国性刊物发表论文	每篇论文	2-3
7	科研	视参与科研项目时间与科研能力	每项	1-3
		大学生创新创业项目	通过	2
8	实验	视创新情况	每项	1-3
9	劳动教育（必修）	32 学时		2

注：“思政课社会实践”（64 学时，2 学分）作为必修环节纳入课外学分管理；“创新创业”要求至少 2 学分，可以通过表中“竞赛”、“论文”、“科研”、“实验”等内容认定。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Qualifications	CET-6	Students whose Band-6 exam scores passed university requirements	2
		TOEFL	Score 90 or more	2
		IELTS	Score 6.5 or more	2
		GRE	Score 325 or more	2
		National College Oral English Examination	A、B、C	3,2,1
4	Computer Qualifications	National Computer Rank Examination	Holder of the Certificate of Band-2 or higher	2
		National Computer Software Qualification	Holder of the Certificate of programmer	2
			Holder of the Certificate of Advanced Programmer	3
			Holder of the Certificate of System Analyst	4



continue

No.	Activities	Requirements		Extracurricular Credits
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic papers	Published in National-level Journals	Each Paper	2~3
7	Research Programs	Contribution and Research Capability	Each Program	1~3
		Innovative Entrepreneurship Projects for College Students	Passed	2
8	Experiments	Innovation Capacity	Each Experiment	1~3
9	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

电路理论 Circuit Theory、模拟电路与数字系统（一、二、三）Analog Circuit and Digital System (I、II、III)、信号与线性系统 Signal and Linear System、数字信号处理 Digital Signal Processing、通信原理 Principles of Communications、基础信息论 Fundamentals of Information Theory、计算机网络 Computer Networks、随机过程 Stochastic Process、电磁场与电磁波 Electromagnetic Field and Wave、微波技术基础 Fundamentals of Microwave Engineering、微波射频电路 Microwave RF Circuits、天线 Antenna、电波传播 Radio Wave Propagation、雷达与信息对抗 Radar and Information Antagonism。

#### (二) 创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Orientational Innovation (Entrepreneurship) Courses : 信息技术导论 Introduction to Information Technologies

创新能力培养类课程 Capacity-building Innovation (Entrepreneurship) Courses : 硬件课程设计 Project of Hardware

创新实践实训类课程 Innovative Practice Training Courses : 专业方向课程设计 Capstone Project Design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

电子线路设计测试实验（一、二）Electronic Circuit Design, Test and Experiments (I、II)、模拟电路与数字系统（三）实验 Experiments of Analog Circuit and Digital System (III)、软件课程设计 Course Project of Software、硬件课程设计 Course Project of Hardware。

## 九、教学进程计划表

### IX. Course Schedule

华中科技大学 2022 级本科专业培养计划

院（系）：电子信息与通信学院

专业：电磁场与无线技术

School (Department) : School of Electronic Information and Communications Major: Electromagnetic field and wireless technology

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Laws	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	EIC0011	计算机与程序设计基础（C） Fundamental of Computer Programming ( C )	56	3.5		20	1
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	微积分（一）（上） Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分（一）（下） Calculus ( II )	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments ( I )	32	1	32		2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.75	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Functions and Integral Transforms	40	2.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Mathematical Equations and Functions	40	2.5			4
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiments	32	1	32		3
	必修 Required	EIC0671	信号与线性系统（二） Signal and Linear System（II）	64	4	8		4
	必修 Required	EIC0582	模拟电路与数字系统（一） Analog Circuit and Digital System（I）	56	3.5			3
	必修 Required	EIC0561	模拟电路与数字系统（二） Analog Circuit and Digital System（II）	48	3			3
	必修 Required	EIC0571	模拟电路与数字系统（三） Analog Circuit and Digital System（III）	48	3			4
	必修 Required	EIC0551	电子线路设计、测试及实验（一） Electronic Circuitry Design, Test and Experiments（I）	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试及实验（二） Electronic Circuitry Design, Test and Experiments（II）	32	1	32		4
	必修 Required	EIC0612	计算机网络 Computer Networks	32	2			5
	必修 Required	EIC5631	信息技术导论 Introduction to Information Technologies	24	1.5			1
专业核心课程 Specialty Core Courses	必修 Required	EIC2101	随机过程 Stochastic Process	32	2			4
	必修 Required	EIC2081	数据结构 Data Structure	48	3		12	2
	必修 Required	EIC2041	模拟电路与数字系统（三）实验 Experiment of Analog Circuit and Digital System（III）	32	1	32		4
	必修 Required	EIC2091	数字信号处理 Digital Signal Processing	48	3	8		5
	必修 Required	EIC2072	基础信息论 Fundamentals of Information Theory	24	1.5			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Specialty Core Courses 专业核心课程	必修 Required	EIC2053	通信电子线路 Electronic Circuits of Communications	56	3.5	8		5
	必修 Required	EIC2011	电磁场与电磁波 Electromagnetic Field and Wave	48	3			4
	必修 Required	EIC2111	通信原理 Principles of Communications	56	3.5	8		5
	必修 Required	EIC0621	微波技术基础 Fundamentals of Microwave Engineering	56	3.5	8		5
Specialty-oriented Courses 专业选修课程	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5451	数据库及应用实践 Database Systems	56	3.5	12		6
	选修 Elective	EIC5021	操作系统 Operating Systems	48	3		8	6
	选修 Elective	EIC5231	ARM 处理器及应用 ARM Processor and Applications	48	3	32		5
	选修 Elective	EIC5241	Altera 可编程片上系统及应用 Altera SOPC and Applications	48	3	32		5
	选修 Elective	EIC5301	Xilinx FPGA 及应用 Xilinx FPGA and Applications	48	3	32		5
	选修 Elective	EIC5281	MSP430 单片机及应用 MSP430 Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5261	Freescale 单片机及应用 Freescale Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5221	8051 系列单片机原理及应用 8051 Microcontroller Principles and Applications	48	3	32		5
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5731	嵌入式 Linux 软件设计 Embedded Linux Software Design	48	3	32		6
	选修 Elective	EIC5641	虚拟仪器技术及应用 Virtual Instrumentation and Applications	32	2			6
	选修 Elective	EIC5031	传感器技术及应用 Sensor Technology and Applications	32	2			6
	选修 Elective	EIC5621	小波分析与应用 Wavelet Analysis and Application	32	2	8		6
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5671	医学图像处理 Medical Image Processing	32	2	8		7
	选修 Elective	EIC5681	应用密码学 Applied Cryptography	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5411	绿色通信技术导论 Introduction to Green Communications	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5691	阵列信号处理 Array Signal Processing	32	2			6
	选修 Elective	OEI2271	微电子器件与 IC 设计 (一) Electronic Device Basics and IC Design ( I )	56	3.5			6
	选修 Elective	EIC5011	Python 编程技术 Python Programming	32	2			5
	选修 Elective	EIC5051	大数据技术原理与应用 Principles and Applications of Big Data Technology	56	3.5		8	6
	选修 Elective	EIC5471	数据挖掘 Data Mining	48	3		8	6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
	选修 Elective	EIC5421	软件无线电 Software Defined Radio	32	2			6
			专业方向选修课程 Elective Major Courses					
			电子：射频与无线技术方向 RF & Wireless Technology					
	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC6011	天线 Antenna	32	2			5
	选修 Elective	EIC5651	雷达与信息对抗 Radar and Information Antagonism	32	2			6
	选修 Elective	EIC6021	电波传播 Radio Wave Propagation	32	2			6
	选修 Elective	EIC5074	电磁与无线技术课程设计 Capstone Project in Electromagnetic and Wireless Technologies	80	5	80		7

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（三） Engineering Training（III）	2w	1			4
	必修 Required	EIC3542	生产实习 Engineering Internship	2w	1			6
	必修 Required	EIC3531	软件课程设计 Course Project of Software	2w	1			5
	必修 Required	EIC3551	硬件课程设计 Course Project of Hardware	2w	1			6
	必修 Required	EIC3511	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 信息类数理提高班本科培养计划

### Bachelor degree of Engineering (BEng) in Information Science for Advanced Class in Mathematics and Physics

#### 一、培养目标

##### I. Program Objectives

提高班是我校“因材施教”培养信息科学领域拔尖人才的基地。提高班的培养目标是，培养具有良好心理素质、数理基础扎实、富有开拓创新精神、能从事基础和应用研究的优秀人才。

本计划参照电子信息工程专业的培养目标制定，如学生选择信息大类其他专业，可参考本计划的后面的说明，按照选定专业的培养计划进行。

The Advanced Class in mathematics and physics for information science serves as the college education reform base to produce top-tier talents in information sciences following the personalized education principle in our university. This program is designed to cultivate fully-developed researchers, who are committed to conduct fundamental and applied research, with outstanding psychological stability, consolidated backgrounds in both mathematics and physics, and strong innovative initiatives.

This program is designed at large following the BEng program in Electronic and Information Engineering. If a student selects another major in information disciplines, this student is required to take courses following the program of her/his selected major (see appendix).

#### 二、基本规格要求

##### II. Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有扎实的数理基础，具有扎实的专业英语语言能力；
2. 掌握文献检索和撰写科技论文的方法，了解信息学科的发展动态和理论前沿；
3. 理解信息科学的基本理论和方法，具有研究理论问题的能力
4. 掌握通信与信息系统的构成原理与技术，具有参与设计和开发的实践能力；
5. 具有较好的人文社科知识和人文素质；
6. 具有较强的团队合作和科技创新精神。

Students are expected to acquire the following knowledge or skills:

1. Consolidated background in both mathematics and physics and strong professional English capabilities;
2. Skills in searching literatures and writing technical report, and familiar with the development trends in the information discipline and research frontiers;
3. Understanding of basic theories and methods in information science, and research capabilities of theoretical problems;
4. Mastering principles and technologies in communication systems, communication networks and participating in the design and development of information systems;
5. Sound knowledge in humanities-and-art and good personality;
6. Cooperative attitude as a team player and strong innovative initiatives.

### 三、培养特色

#### III. Program Highlights

强调拔尖研究型人才的良好思想品德和心理素质训练，强调数理基础与专业能力的结合，强调厚积薄发的长线培养模式；加强学生在大学数学与物理方面的理论基础，在电子电路、信号处理等方向的专业基础知识；培养学生在通信系统与网络、信息处理与应用系统等方面的工程实践和创新能力；培养能从事跨专业乃至跨学科综合研究和高层次技术开发的优秀人才。

The program focuses on training top-tier researchers with outstanding morality and psychological stability, excellent integration of solid mathematics-physics background and professional capability. This program is designed following the long-term training pattern and focuses on constructing a solid foundation and sustainable career development. In particular, the students are strengthened with a solid theoretical foundation in mathematics and physics, and professional knowledge and skills in electronic circuits and signal processing. The students are also enhanced with the hands-on engineering experiences and innovative initiatives in the design and development of communication systems and networks, information processing systems. Upon graduation, graduates are able to conduct outstanding multi-disciplinary or even interdisciplinary research, and technology development with impact.

### 四、主干学科

#### II. Academic Discipline

信息与通信工程

Information and Communication Engineering

### 五、学制与学位

#### III. Program Length and Degree

学制：四年制

Program Length: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### IV. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：158.25 学分。其中，专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Minimum Credits of Curriculum (including courses and intensive practical training/internship) : 159.25 credits

完成学业最低课外学分要求：不少于 5 学分。

Minimum Extracurricular Credits: 5 Credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	644/33.5	21.17
		选修	160/10	6.32
学科基础课程		必修	944/54.25	34.28
专业课程	专业核心课程	必修	376/22.5	14.22
	专业选修课程	选修	400/25	15.80



续表

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
集中性实践教学环节	必修	26w/13	8.21
总计		2524/158.25	100
其中, 总实验 (实践) 学时学分		328+26w/25.3%	

注: 集中性实践教学环节在总学时统计时按每周 16 学时计算。

Course Type	Required/Elective	Hrs/Crs	Percentage (%)
General Education Core Curriculum	Required	644/33.5	21.17
	Elective	160/10	6.32
Discipline-related Courses	Required	944/54.25	34.28
Courses in Major	Major Core Courses	Required	376/22.5
	Basic Sub-disciplinary Courses	Elective	400/25
Intensive Engineering Practice	Required	26w/13	8.21
Total		2524/158.25	100
Practicum Credits		328+26w/25.3%	

## 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	7.7
工程训练 (三)	必修	2w/1	7.7
生产实习	必修	2w/1	7.7
软件课程设计	必修	2w/1	7.7
硬件课程设计	必修	2w/1	7.7
毕业设计 (论文)	必修	16w/8	61.5
合计		26w/13	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	7.7
Engineering Training (III)	Required	2w/1	7.7
Engineering Internship	Required	2w/1	7.7
Course Project of Software	Required	2w/1	7.7
Course Project of Hardware	Required	2w/1	7.7
Undergraduate Thesis	Required	16w/8	61.5
Total		26w/13	100

## 3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	课外学分
1	思政课社会实践 (必修)	提交调查报告, 取得成绩	2
2	社会实践活动	提交社会调查报告, 通过答辩者	2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者	2
3	英语水平考试	全国大学英语六级考试	获六级证书者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
		全国大学生英语口语考试	A、B、C
			3、2、1

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
3	计算机水平考试	全国计算机等级考试		获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
5	论文	在全国性刊物发表论文		每篇论文
6	科研	视参与科研项目时间与科研能力		每项
		大学生创新创业项目		通过
7	实验	视创新情况		每项
8	劳动教育（必修）	32 学时		2

注：“思政课社会实践”（64 学时，2 学分）作为必修环节纳入课外学分管理；“创新创业”要求至少 2 学分，可以通过表中“竞赛”、“论文”、“科研”、“实验”等内容认定。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Qualifications	CET-6	Students whose Band-6 exam scores passed university requirements	2
		TOEFL	Above 90	2
		IELTS	Above 6.5	2
		GRE	Above 325	2
		National College Student Spoken English Test	A、B、C	3、2、1
	Computer Proficiency	National Computer Rank Examination	Holder of the Certificate of Band-2 or higher	2
		National Computer Software Qualification、Proficiency Test	Holder of the Certificate of programmer	2
			Holder of the Certificate of Advanced Programmer	3
			Holder of the Certificate of System Analyst	4
4	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3

continue

No.	Activities	Requirements		Extracurricular Credits
5	Academic papers	Published in National-level Journals	Each Paper	2~3
6	Research Programs	Contribution and Research Capability	Each Program	1~3
		Undergraduate Innovation and Entrepreneurship Project	Pass	2
7	Experiments	Innovation Capacity	Each Experiment	1~3
8	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、模拟电路与数字系统（一、二、三） Analog Circuit and Digital System (I、II、III)、信号与线性系统 Signal and Linear System、数字信号处理 Digital Signal Processing、通信原理 Principles of Communications、通信电子线路 Electronic Circuits of Communications、基础信息论 Fundamentals of Information Theory、电磁场与电磁波 Electromagnetic Field and Wave、数据结构 Data Structure。

#### （二）创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Orientational Innovation (Entrepreneurship) Courses : 信息技术导论 Introduction to Information Technologies

创新能力培养类课程 Capacity-building Innovation (Entrepreneurship) Courses : 硬件课程设计 Project of Hardware

创新实践实训类课程 Innovative Practice Training Courses : 专业方向课程设计 Capstone Project Design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments included)

电子线路设计·测试·实验（一、二） Electronic Circuit Design, Test and Experiments (I、II)、模拟电路与数字系统（三）实验 Experiments of Analog Circuit and Digital System (III)、软件课程设计 Course Project of Software、硬件课程设计 Course Project of Hardware、毕业设计（论文） Undergraduate Thesis

## 九、教学进程计划表

### IX. Course Schedule

院（系）：电子信息与通信学院

专业：电子信息工程

School (Department) : School of Electronic Information and Communications

Major: Electronics and Information Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Laws	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( II )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	EIC0011	计算机与程序设计基础（C） Fundamental of Computer Programming ( C )	56	3.5		20	1
	选修 Elective	GEC1071	批判性思维 Critical Thinking	24	1.5			3
	选修 Elective	GEC1041	科学计算引论 Introduction to Scientific Computing	56	3.5		16	3
	选修 Elective	GEC1161	数学建模 Mathematical Modeling	40	2.5			4
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	高等数学（A）（上） Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	高等数学（A）（下） Calculus ( II )	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments ( I )	32	1	32		2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related Courses	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.75	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Functions and Integral Transforms	40	2.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Mathematical Equations and Functions	40	2.5			4
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EIC0721	电路测试实验 Circuit Measurement Experiments	32	1	32		3
	必修 Required	EIC0671	信号与线性系统（二） Signal and Linear System（II）	64	4	16		4
	必修 Required	EIC0581	模拟电路与数字系统（一） Analog Circuit and Digital System（I）	48	3			3
	必修 Required	EIC0561	模拟电路与数字系统（二） Analog Circuit and Digital System（II）	48	3			3
	必修 Required	EIC0571	模拟电路与数字系统（三） Analog Circuit and Digital System（III）	48	3			4
	必修 Required	EIC0551	电子线路设计、测试及实验（一） Electronic Circuitry Design, Test and Experiments（I）	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试及实验（二） Electronic Circuitry Design, Test and Experiments（II）	32	1	32		4
	必修 Required	EIC0612	计算机网络 Computer Networks	32	2			5
	必修 Required	EIC5631	信息技术导论 Introduction to Information Technologies	24	1.5			1
专业核心课程 Specialty Core Courses	必修 Required	EIC2081	数据结构 Data Structure	48	3		12	2
	必修 Required	EIC2101	随机过程 Stochastic Process	32	2			4
	必修 Required	EIC2041	模拟电路与数字系统（三）实验 Experiment of Analog Circuit and Digital System（III）	32	1	32		4
	必修 Required	EIC2012	电磁场与电磁波 Electromagnetic Field and Wave	40	2.5			5
	必修 Required	EIC2121	微波技术基础 Fundamentals of Microwave Engineering	48	3	8		6
	必修 Required	EIC2052	通信电子线路 Electronic Circuits of Communications	48	3	8		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Core Courses	必修 Required	EIC2091	数字信号处理 Digital Signal Processing	48	3	8		5
	必修 Required	EIC2072	基础信息论 Fundamentals of Information Theory	24	1.5			4
	必修 Required	EIC2111	通信原理 Principles of Communications	56	3.5	8		5
专业选修课程 Specialty-oriented Courses			专业公共选修课程 Elective Major Courses					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5451	数据库及应用实践 Database Systems	56	3.5	12		6
	选修 Elective	EIC5021	操作系统 Operating Systems	48	3		8	6
	选修 Elective	EIC5231	ARM 处理器及应用 ARM Processor and Applications	48	3	32		5
	选修 Elective	EIC5241	Altera 可编程片上系统及应用 Altera SOPC and Applications	48	3	32		5
	选修 Elective	EIC5301	Xilinx FPGA 及应用 Xilinx FPGA and Applications	48	3	32		5
	选修 Elective	EIC5281	MSP430 单片机及应用 MSP430 Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5261	Freescale 单片机及应用 Freescale Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5221	8051 系列单片机原理及应用 8051 Microcontroller Principles and Applications	48	3	32		5
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5731	嵌入式 Linux 软件设计 Embedded Linux Software Design	48	3	32		6
	选修 Elective	EIC5641	虚拟仪器技术及应用 Virtual Instrumentation and Applications	32	2			6
	选修 Elective	EIC5031	传感器技术及应用 Sensor Technology and Applications	32	2			6
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5671	医学图像处理 Medical Image Processing	32	2	8		7
	选修 Elective	EIC5681	应用密码学 Applied Cryptography	32	2			7
	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5411	绿色通信技术导论 Introduction to Green Communications	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC5521	天线与电波传播 Antenna and Radio Wave Propagation	32	2			5
	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5011	Python 编程技术 Python Programming	32	2			5
	选修 Elective	OEI2271	微电子器件与 IC 设计 (一) Electronic Device Basics and IC Design ( I )	56	3.5			6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
			专业方向选修课程 Elective Major Courses					
			信息 1 : 多媒体信息处理方向 (Multimedia Information Processing)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5111	多媒体技术与应用 Multimedia Technology and Application	40	2.5		16	6
	选修 Elective	EIC5511	数字语音处理 Digital Speech Processing	32	2		8	6
	选修 Elective	EIC5441	视频处理与通信 Video Processing and Communications	40	2.5		8	7
	选修 Elective	EIC5101	多媒体技术课程设计 Capstone Project in Multimedia Technologies	80	5		32	7
			信息 2 : 大数据处理方向 (Big Data Processing)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5051	大数据技术原理与应用 Principles and applications of big data technology	56	3.5		8	6
	选修 Elective	EIC5471	数据挖掘 Data Mining	48	3		8	6
	选修 Elective	EIC5041	大数据处理系统设计与实现 Capstone Project in Big Data Processing Systems	56	3.5		44	7
			信息 3：网络应用方向 (Network Applications)					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5081	电子商务概论 Introduction to Electronic Commerce	32	2			6
	选修 Elective	EIC5381	计算机网络实验 Computer Network Labs	32	2	24		6
	选修 Elective	EIC5291	网络科学 Network Science	32	2			7
	选修 Elective	EIC5341	互联网应用系统设计与实验 Capstone Project in Internet Application Systems	80	5	16		7
			信息 4：智能电路系统方向 (Intelligent Circuit Systems)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5141	机电控制技术 Electromechanical Control Technologies	64	4	32		6
	选修 Elective	EIC5721	智能硬件系统设计 Intelligent Hardware System Design	64	4	48		7
	选修 Elective	EIC5711	智能机器人设计 Intelligent Robot Design	64	4			7
			信息 5：数字信号处理方向 (Digital Signal Processing)					
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5501	数字信号系统设计与实现 Capsonte Project in Digital Signal Processing systems	96	6	64		6
	选修 Elective	EIC5691	阵列信号处理 Array Signal Processing	32	2	4		6
	选修 Elective	EIC5491	数字信号处理平台高级程序设计 Advanced Programming for Digital Signal Processing Platforms	32	2	16		7
	选修 Elective	EIC5601	现代数字信号处理 Advanced Digital Signal Processing	32	2	8		7



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			信息 6：机器智能方向 (Machine Intelligence)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
	选修 Elective	EIC6041	多媒体检索 Multimedia Retrieval	40	2.5		8	7
	选修 Elective	EIC6061	机器智能课程设计 Capstone Project in Machine Intelligence	80	5		32	7
			通信 1：通信网络方向 (Communication Networks)					
	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5381	计算机网络实验 Computer Network Labs	32	2	24		6
	选修 Elective	EIC5801	网络系统设计和实验 Capstone Project in Network Systems	80	5	16		7
			通信 2：移动通信方向 (Mobile Communications)					
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5191	移动通信网络 Mobile Communication Networks	48	3	16		7
	选修 Elective	EIC5531	通信编码理论 Communication Coding Theory	48	3	16		7
	选修 Elective	EIC5201	移动通信系统设计和实验 Capstone Project in Mobile Communication Systems	80	5	60		7
			通信 3：空间通信方向 (Space Communications)					
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5171	卫星通信原理 Principles of Satellite Communications	48	3	16		6
	选修 Elective	EIC5091	定位与导航技术 Location and Navigation Technologies	48	3	16		7
	选修 Elective	EIC5811	卫星通信系统 Satellite Communication Systems	32	2			7
	选修 Elective	EIC5391	空间通信系统设计和实验 Capstone Project in Space Communication Systems	80	5	16		7
			电子 1：射频与无线技术方向 (RF & Wireless Technology)					
	选修 Elective	EIC6011	天线 Antenna	32	2			5
	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC5351	计算电磁学 Computational Electromagnetics	32	2			6
	选修 Elective	EIC6021	电波传播 Radio Wave Propagation	32	2			6
	选修 Elective	EIC5401	雷达与信息对抗 Radar and Information Antagonism	32	2			6
	选修 Elective	EIC5071	电磁与无线技术课程设计 Capstone Project in Electromagnetic and Wireless Technologies	80	5	60		7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（三） Engineering Training（III）	2w	1			4
	必修 Required	EIC3531	软件课程设计 Course Project of Software	2w	1			5
	必修 Required	EIC3551	硬件课程设计 Course Project of Hardware	2w	1			6
	必修 Required	EIC3571	企业（生产）实习（企业） Enterprise（Engineering）Internship	2w	1			6
	必修 Required	EIC3511	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 电信卓越计划实验班本科培养计划

### Undergraduate Experimental Program in Communication and Information Engineering for Exemplary Engineer Education

#### 一、培养目标

##### I . Program Objectives

培养电子信息领域兼具技术知识和管理能力的高级复合型人才。本培养计划定位于本科阶段，在教授学生在信息科学领域基础理论知识的同时，加强对学生参与设计和开发实际电子通信、信息处理系统的技能培养。本计划还将提供大量实践环节训练，培养学生综合运用专业知识解决实际问题的能力，培养学生在系统工程、项目管理等方面的素养。

This program is to produce fully-developed top-tier engineers with both consolidated technical knowledge and management capability in electronics and information engineering. This program is designed for undergraduate students, who are required to construct fundamental theoretical background in information science. Meanwhile, they are enhanced with hands-on engineering experiences in the design and development of electronic communications and information processing systems. This program will also provide the students in this program with many practical training opportunities to develop their comprehensive capabilities of applying professional knowledge and skills in solving real engineering problems, in order to strength their engineering insights into system engineering, project management and so on.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有较扎实的专业基础，较强的英语语言能力；
2. 了解各种信息应用系统的发展动态；
3. 掌握通信系统、信息处理系统的基本原理与技术；
4. 熟悉工程开发、项目管理的规律和原则；
5. 具有参与设计和开发信息系统的工程实践能力；
6. 具有较强的自学能力，发现和解决实际问题的能力；
7. 具有较好人文素质和专业素养；
8. 具有较强的沟通和协调能力和团队合作精神；
1. Consolidated professional background and strong English capability;
2. Familiar with the development trends in various information application systems;
3. Mastering principles and skills in communication systems, information processing systems
4. Familiar with common practices and principles in project development and management;
5. Hands-on engineering experiences of the design and development of information systems;
6. Strong capabilities of self-learning, indentifying and solving real engineering problems;
7. Sound knowledge in humanities-and-art, good personality and professional qualification;
8. Strong capability of communication and coordination, and cooperative attitude as a team player.

### 三、培养特色

#### III. Program Highlights

本专业将以通信系统、信号与信息处理等电子信息系统的开发与应用为方向，培养学生在电子技术、信号处理等方面的理论基础，加强在系统设计、工程方法、项目管理等方面的课程训练。本专业还将通过校企联合的方式，提供大量实验与实践环节的训练，贴近信息产业的生产研发一线，培养学生的动手能力、创新能力以及专业素养。

修完本专业课程后，学生也可选择攻读电子科学、通信工程、计算机科学、自动化、光电信息等领域的研究生。

This program focuses on the design and application of information systems in communication systems, signal and information processing. Students are required to construct solid and broad theoretical background in electronic technologies and information processing, and they are enhanced with the hands-on engineering experiences in system design, engineering methods and project management. This program will also provide many internships and engineering practices through joint programs between the university and cooperated enterprises. Students are expected to approach real research and development activities in the information industry, and to develop strong practical engineering skills, innovative initiatives and professional qualification.

Upon graduation, graduates may choose to continue their studies at the postgraduate level in electronic science, communication engineering, computer science, automation and optical-electronic or other related disciplines.

### 四、主干学科

#### IV. Academic Discipline

信息与通信工程

Information and Telecommunication Engineering

### 五、学制与学位

#### V. Program Length and Degree

学制：四年制

Program Length: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：161.25 学分。其中，专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Minimum Credits of Curriculum (including courses and intensive practical training/internship) : 161.25 credits

完成学业最低课外学分要求：不少于 5 学分。

Minimum Extracurricular Credits: 5 Credits

#### 1. 课程体系学时与学分

Course Credits Hours and Units

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	644/33.5	20.78
	选修	160/10	6.20
学科基础课程	必修	984/56.75	35.19

续表

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
专业课程	专业核心课程	必修	376/22.5	13.95
	专业选修课程	选修	400/25	15.50
集中性实践教学环节		必修	27w/13.5	8.37
总计			2564+27w/161.25	100
其中, 总实验(实践)学时学分			328+27w/25.4%	

注: 集中性实践教学环节在总学时统计时按每周 16 学时计算。

Course Type		Required/Elective	Hrs/Crs	Percentage (%)
General Education Core Curriculum		Required	644/33.5	20.78
		Elective	160/10	6.20
Discipline-related Courses		Required	984/56.75	35.19
Courses in Major	Major Core Courses	Required	376/22.5	13.95
	Basic Sub-disciplinary Courses	Elective	400/25	15.50
Intensive Engineering Practice		Required	27w/13.5	8.37
Total			2564+27w/161.25	100
Practicum Credits			328+27w/25.4%	

## 2. 集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	7.4
工程训练(三)	必修	2w/1	7.4
专业认知实习(企业)	必修	1w/0.5	3.7
企业(生产)实习(企业)	必修	2w/1	7.4
软件课程设计	必修	2w/1	7.4
硬件课程设计	必修	2w/1	7.4
毕业设计(论文)	必修	16w/8	59.3
合计		27w/13.5	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	7.4
Engineering Training (III)	Required	2w/1	7.4
Professional Cognition Internship (Enterprise)	Required	1w/0.5	3.7
Enterprise (Engineering) Internship	Required	2w/1	7.4
Course Project of Software	Required	2w/1	7.4
Course Project of Hardware	Required	2w/1	7.4
Undergraduate Thesis	Required	16w/8	59.3
Total		27w/13.5	100

## 3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	思政课社会实践(必修)	提交调查报告, 取得成绩		2
2	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
3	英语水平考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	2
		雅思考试	达 6.5 分以上者	2
		GRE 考试	达 325 分以上者	2
		全国大学生英语口语考试	A、B、C	3、2、1

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
3	计算机水平考试	全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
4	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
5	论文	在全国性刊物发表论文	每篇论文	2~3
6	科研	视参与科研项目时间与科研能力	每项	1~3
		大学生创新创业项目	通过	2
7	实验	视创新情况	每项	1~3
8	劳动教育（必修）	32 学时		2

注：“思政课社会实践”（64 学时，2 学分）作为必修环节纳入课外学分管理；“创新创业”要求至少 2 学分，可以通过表中“竞赛”、“论文”、“科研”、“实验”等内容认定。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Qualifications	CET-6	Students whose Band-6 exam scores passed university requirements	2
		TOEFL	Above 90	2
		IELTS	Above 6.5	2
		GRE	Above 325	2
		National College Student Spoken English Test	A、B、C	3、2、1
	Computer Proficiency	National Computer Rank Examination	Holder of the Certificate of Band-2 or higher	2
		National Computer Software Qualification、Proficiency Test	Holder of the Certificate of programmer	2
			Holder of the Certificate of Advanced Programmer	3
			Holder of the Certificate of System Analyst	4
4	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3

continue

No.	Activities	Requirements		Extracurricular Credits
5	Academic papers	Published in National-level Journals	Each Paper	2~3
6	Research Programs	Contribution and Research Capability	Each Program	1~3
		Undergraduate Innovation and Entrepreneurship Project	Pass	2
7	Experiments	Innovation Capacity	Each Experiment	1~3
8	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、模拟电路与数字系统（一、二、三） Analog Circuit and Digital System (I、II、III)、信号与线性系统 Signal and Linear System、数字信号处理 Digital Signal Processing、通信原理 Principles of Communications、通信电子线路 Electronic Circuits of Communications、基础信息论 Fundamentals of Information Theory、电磁场与电磁波 Electromagnetic Field and Wave、数据结构 Data Structure。

#### （二）创新创业课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Orientational Innovation (Entrepreneurship) Courses : 信息技术导论 Introduction to Information Technologies

创新能力培养类课程 Capacity-building Innovation (Entrepreneurship) Courses : 硬件课程设计 Project of Hardware

创新实践实训类课程 Innovative Practice Training Courses : 专业方向课程设计 Capstone Project Design

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

电子线路设计·测试·实验（一、二） Electronic Circuit Design, Test and Experiments (I、II)、模拟电路与数字系统（三）实验 Experiments of Analog Circuit and Digital System (III)、软件课程设计 Course Project of Software、硬件课程设计 Course Project of Hardware、企业（生产）实习（企业） Enterprise (Engineering) Internship、毕业专题设计（企业） Undergraduate Thesis。

## 九、教学进程计划表

### IX. Course Schedule

院（系）：电子信息与通信学院

专业：电子信息工程

School (Department) : School of Electronic Information and Communications

Major: Electronics and Information Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Laws	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English（I）	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English（II）	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education（I）	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education（II）	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education（III）	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	EIC0011	计算机与程序设计基础（C） Fundamental of Computer Programming（C）	56	3.5		20	1
	选修 Elective	GEC1071	批判性思维 Critical Thinking	24	1.5			3
	选修 Elective	GEC1101	市场研究 Marketing Research	32	2			5
	选修 Elective	GEC1111	知识产权法律基础 Fundamentals of Intellectual Property Laws	32	2			6
	选修 Elective	EIC5661	业界课程 Industry-based Courses	32	2			7
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related Courses	必修 Required	MAT0551	高等数学（A）（上） Calculus（I）	88	5.5			1
	必修 Required	MAT0531	高等数学（A）（下） Calculus（II）	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments（I）	32	1	32		2



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.75	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Functions and Integral Transforms	40	2.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Mathematical Equations and Functions	40	2.5			4
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5			1
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EIC0721	电路测试实验 Circuit Measurement Experiments	32	1	32		3
	必修 Required	EIC0671	信号与线性系统（二） Signal and Linear System（II）	64	4	16		4
	必修 Required	EIC0581	模拟电路与数字系统（一） Analog Circuit and Digital System（I）	48	3			3
	必修 Required	EIC0561	模拟电路与数字系统（二） Analog Circuit and Digital System（II）	48	3			3
	必修 Required	EIC0571	模拟电路与数字系统（三） Analog Circuit and Digital System（III）	48	3			4
	必修 Required	EIC0551	电子线路设计、测试及实验（一） Electronic Circuitry Design, Test and Experiments（I）	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试及实验（二） Electronic Circuitry Design, Test and Experiments（II）	32	1	32		4
	必修 Required	EIC0612	计算机网络 Computer Networks	32	2			5
	必修 Required	EIC5631	信息技术导论 Introduction to Information Technologies	24	1.5			1
专业核心课程 Specialty Core Courses	必修 Required	EIC2081	数据结构 Data Structure	48	3		12	2
	必修 Required	EIC2101	随机过程 Stochastic Process	32	2			4
	必修 Required	EIC2041	模拟电路与数字系统（三）实验 Experiment of Analog Circuit and Digital System（III）	32	1	32		4
	必修 Required	EIC2012	电磁场与电磁波 Electromagnetic Field and Wave	40	2.5			5
	必修 Required	EIC2121	微波技术基础 Fundamentals of Microwave Engineering	48	3	8		6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置 学期 semester
						实验 exp.	上机 operation	
专业 核心 课程 Specialty Core Courses	必修 Required	EIC2052	通信电子线路 Electronic Circuits of Communications	48	3	8		5
	必修 Required	EIC2091	数字信号处理 Digital Signal Processing	48	3	8		5
	必修 Required	EIC2072	基础信息论 Fundamentals of Information Theory	24	1.5			4
	必修 Required	EIC2111	通信原理 Principles of Communications	56	3.5	8		5
专业 选修课程 Specialty-oriented Courses			专业公共选修课程 Elective Major Courses					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5451	数据库及应用实践 Database Systems	56	3.5	12		6
	选修 Elective	EIC5021	操作系统 Operating Systems	48	3		8	6
	选修 Elective	EIC5231	ARM 处理器及应用 ARM Processor and Applications	48	3	32		5
	选修 Elective	EIC5241	Altera 可编程片上系统及应用 Altera SOPC and Applications	48	3	32		5
	选修 Elective	EIC5301	Xilinx FPGA 及应用 Xilinx FPGA and Applications	48	3	32		5
	选修 Elective	EIC5281	MSP430 单片机及应用 MSP430 Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5261	Freescale 单片机及应用 Freescale Microcontroller and Applications	48	3	32		5
	选修 Elective	EIC5221	8051 系列单片机原理及应用 8051 Microcontroller Principles and Applications	48	3	32		5
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5731	嵌入式 Linux 软件设计 Embedded Linux Software Design	48	3	32		6
	选修 Elective	EIC5641	虚拟仪器技术及应用 Virtual Instrumentation and Applications	32	2			6
	选修 Elective	EIC5031	传感器技术及应用 Sensor Technology and Applications	32	2			6
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5671	医学图像处理 Medical Image Processing	32	2	8		7
	选修 Elective	EIC5681	应用密码学 Applied Cryptography	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5411	绿色通信技术导论 Introduction to Green Communications	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC6011	天线 Antenna	32	2			5
	选修 Elective	EIC6021	电波传播 Radio Wave Propagation	32	2			6
	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5011	Python 编程技术 Python Programming	32	2			5
	选修 Elective	OEI2271	微电子器件与 IC 设计 (一) Electronic Device Basics and IC Design ( I )	56	3.5			6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
			专业方向选修课程 Elective Major Courses					
			信息 1 : 多媒体信息处理方向 (Multimedia Information Processing)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5111	多媒体技术与应用 Multimedia Technology and Application	40	2.5		16	6
	选修 Elective	EIC5511	数字语音处理 Digital Speech Processing	32	2		8	6
	选修 Elective	EIC5441	视频处理与通信 Video Processing and Communications	40	2.5		8	7
	选修 Elective	EIC5101	多媒体技术课程设计 Capstone Project in Multimedia Technologies	80	5		32	7

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			信息 2 : 大数据处理方向 (Big Data Processing)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5051	大数据技术原理与应用 Principles and Applications of Big Data Technology	56	3.5		8	6
	选修 Elective	EIC5471	数据挖掘 Data Mining	48	3		8	6
	选修 Elective	EIC5041	大数据处理系统设计与实现 Capstone Project in Big Data Processing Systems	56	3.5		44	7
			信息 3 : 网络应用方向 (Network Applications)					
	选修 Elective	EIC5271	Java 语言程序设计 Java Programming	32	2		16	5
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5081	电子商务概论 Introduction to Electronic Commerce	32	2			6
	选修 Elective	EIC5381	计算机网络实验 Computer Network Labs	32	2	24		6
	选修 Elective	EIC5291	网络科学 Network Science	32	2			7
	选修 Elective	EIC5341	互联网应用系统设计与实验 Capstone Project in Internet Application Systems	80	5	16		7
			信息 4 : 智能电路系统方向 (Intelligent Circuit Systems)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5141	机电控制技术 Electromechanical Control Technologies	64	4	32		6
	选修 Elective	EIC5721	智能硬件系统设计 Intelligent Hardware System Design	64	4	48		7
	选修 Elective	EIC5711	智能机器人设计 Intelligent Robot Design	64	4			7
			信息 5 : 数字信号处理方向 (Digital Signal Processing)					
	选修 Elective	EIC5251	DSP 处理器及应用 Digital Signal Processors and their Applications	48	3	32		6
	选修 Elective	EIC5501	数字信号系统设计与实现 Capsonte Project in Digital Signal Processing systems	96	6	64		6
	选修 Elective	EIC5691	阵列信号处理 Array Signal Processing	32	2	4		6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5491	数字信号处理平台高级程序设计 Advanced Programming for Digital Signal Processing Platforms	32	2	16		7
	选修 Elective	EIC5601	现代数字信号处理 Advanced Digital Signal Processing	32	2	8		7
			信息 6 : 机器智能方向 (Machine Intelligence)					
	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC6031	机器学习 Machine Learning	40	2.5			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
	选修 Elective	EIC6041	多媒体检索 Multimedia Retrieval	40	2.5		8	7
	选修 Elective	EIC6061	机器智能课程设计 Capstone Project in Machine Intelligence	80	5		32	7
			通信 1 : 通信网络方向 (Communication Networks)					
	选修 Elective	EIC5461	现代网络技术 Modern Networking Technologies	32	2			6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5591	物联网 Internet of Things	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5381	计算机网络实验 Computer Network Labs	32	2	24		6
	选修 Elective	EIC5801	网络系统设计和实验 Capstone Project in Network Systems	80	5	16		7
			通信 2 : 移动通信方向 (Mobile Communications)					
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC5191	移动通信网络 Mobile Communication Networks	48	3	16		7
	选修 Elective	EIC5531	通信编码理论 Communication Coding Theory	48	3	16		7
	选修 Elective	EIC5201	移动通信系统设计和实验 Capstone Project in Mobile Communication Systems	80	5	60		7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses			通信 3 : 空间通信方向 (Space Communications)					
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC5171	卫星通信原理 Principles of Satellite Communications	48	3	16		6
	选修 Elective	EIC5091	定位与导航技术 Location and Navigation Technologies	48	3	16		7
	选修 Elective	EIC5811	卫星通信系统 Satellite Communication Systems	32	2			7
	选修 Elective	EIC5391	空间通信系统设计和实验 Capstone Project in Space Communication Systems	80	5	16		7
			电子 1 : 射频与无线技术方向 (RF & Wireless Technology)					
	选修 Elective	EIC6011	天线 Antenna	32	2			5
	选修 Elective	EIC5161	微波射频电路 Microwave Device and Circuits	32	2			6
	选修 Elective	EIC5421	软件无线电 Software Radio	32	2			6
	选修 Elective	EIC6021	电波传播 Radio Wave Propagation	32	2			6
	选修 Elective	EIC5401	雷达与信息对抗 Radar and Information Antagonism	32	2			6
	选修 Elective	EIC5071	电磁与无线技术课程设计 Capstone Project in Electromagnetic and Wireless Technologies	80	5	60		7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练 (三) Engineering Training (III)	2w	1			4
	必修 Required	EIC3531	软件课程设计 Course Project of Software	2w	1			5
	必修 Required	EIC3551	硬件课程设计 Course Project of Hardware	2w	1			6
	必修 Required	EIC3571	企业 (生产) 实习 (企业) Enterprise (Engineering) Internship	2w	1			6
	必修 Required	EIC3511	毕业设计 (论文) Undergraduate Thesis	16w	8			8

## 基于项目信息类专业教育实验班本科培养计划（2+2）

### Undergraduate Program for Advanced Project-based Information Science Education（2+2）

#### 一、培养目标

##### I . Program Objectives

以真实科研项目为牵引，通过“干中学”的方式，将专业理论知识的学习与科研项目实训紧密结合，弱化教师课堂讲授，增强学生自主和快速学习能力、创新思维能力和实践动手能力，促进学生的综合素质发展，培养一批兼具技术力和领导力的精英之才。

This program is designed in a unique “learning-via-doing” approach in that the course study is closely integrated to the research and development practices from real engineering projects. Lecturing time is considerably reduced; however, more credits are contributed to hands-on practical training and interns in order to enhance the students with high self-motivation and quick learning capability, strong innovation initiatives and problem-solving capability. The students are comprehensively trained to produce top-tier elites with solid technical background and outstanding leadership.

#### 二、基本规格要求

##### II . Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

1. 具有较扎实的数理基础，具有较强的英语语言能力；
2. 掌握文献检索和撰写科技论文的方法，了解信息学科的发展动态和理论前沿；
3. 掌握信息科学、电子科学、计算机科学的基本理论和方法；
4. 具有设计和开发通信与信息系统、解决实际问题的工程实践能力；
5. 具有较好的人文社科知识和人文素质；
6. 具有较强的团队合作和科技创新精神。

Students are expected to acquire the following knowledge or skills:

1. Consolidated background in both mathematics and physics and strong English capability;
2. Skills in searching literature and writing technical report, and familiar with the development trends in the discipline and research frontiers;
3. Understanding basic theories and skills in information science, electronics science and computer science;
4. Hands-on engineering experiences in solving real problems in the design and development of communication and information systems;
5. Sound knowledge in humanities-and-art and good personality;
6. Cooperative attitude as a team player and strong innovative initiatives.

#### 三、培养特色

##### III. Program Highlights

本实验班采取 2+2 模式，大二结束时在信息类专业进行实验班学生选拔。以电路、信号处理为基础，电子设备和系统设计及应用为方向，通过强化课堂实验环节以及专设的科研项目训练环节，不仅具有扎实的、宽广的理论基础，而且具有较强的工程实践和创新能力。特别是动手能

力和快速学习能力强；所学知识能灵活运用，终生不忘；具有高尚的道德情操、优秀的工作作风和出色的协调能力，综合素质突出。

This program uses 2+2 mode, recruits students in information related departments at the end of the sophomore year. This program focuses on the design and application of electronic devices and systems in circuit and signal processing. By enforcing the class experiment stage and taking into real engineering projects, Students are required to construct solid and broad theoretical background, and they are enhanced with the hands-on engineering experiences and innovation initiatives. In particular, the students are strong in solving real engineering problems and quick learning; they are able to apply knowledge flexibly in solving real problems in that the knowledge follows the students in a life-long fashion; they are fully-developed with moral integrity, excellent working style and outstanding coordination capability.

#### 四、主干学科

#### IV. Main Discipline

信息与通信工程

Information and Communication Engineering

#### 五、学制与学位

#### V. Program Length and Degree

学制：四年制

Program Length: Four years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

#### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：158.75 学分。

Minimum Credits of Curriculum (including courses and intensive practical training/internship) : 158.75 credits

完成学业最低课外学分要求：不少于 5 学分。

Minimum Extracurricular Credits: 5 Credits

##### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程		必修	644/33.5	21.10
		选修	160/10	6.30
学科基础课程		必修	896/51.25	32.28
专业课程	专业核心课程	必修	448/28	17.64
	专业选修课程	选修	160/10	6.30
集中性实践教学环节		必修	52w/26	16.38
总计			2308+52w/158.75	100
其中，总实验（实践）学时学分			232+52w/33.9%	

Course Type	Required/Elective	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	644/33.5	21.10
	Elective	160/10	6.30
Discipline-related Courses	Required	896/51.25	32.28



continue

Course Type		Required/Elective	Hrs/Crs	Percentage (%)
Courses in Major	Major Core Courses	Required	448/28	17.64
	Basic Sub-disciplinary Courses	Elective	160/10	6.30
Intensive Engineering Practice		Required	52w/26	16.38
Total			2308+52w/158.75	100
Practicum Credits			232+52w/33.9%	

## 2. 集中性实践教学环节周数与学分

## Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	3.9
工程训练 (三)	必修	2/1	3.9
工程训练 (一)	必修	6/3	11.6
工程训练 (二)	必修	10/5	19.2
项目实践	必修	16/8	30.7
毕业设计	必修	16/8	30.7
合计		52W/26	100

Course Title	Required/Elective	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	3.9
Engineering Training ( III )	Required	2/1	3.9
Engineering Training ( I )	Required	6/3	11.6
Engineering Training ( II )	Required	10/5	19.2
Research and Project Task	Required	16/8	30.7
Undergraduate Thesis	Required	16/8	30.7
Total		52W/26	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	思政课社会实践 ( 必须 )	提交调查报告, 取得成绩		2
2	社会实践活动	提交社会调查报告, 通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
3	英语水平考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	2
		雅思考试	达 6.5 分以上者	2
		GRE 考试	达 325 分以上者	2
		全国大学生英语口语考试	A、B、C	3、2、1
4	计算机水平考试	全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
5	竞赛	全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文	在全国性刊物发表论文	每篇论文	2~3
7	科研	视参与科研项目时间与科研能力	每项	1~3
		大学生创新创业项目	通过	2
8	实验	视创新情况	每项	1~3
9	劳动教育（必修）	32 学时		2

注：“思政课社会实践”（64 学时，2 学分）作为必修环节纳入课外学分管理；“创新创业”要求至少 2 学分，可以通过表中“竞赛”、“论文”、“科研”、“实验”等内容认定。

No.	Activities	Requirements		Extracurricular Credits
1	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
2	Community Engagement	Submitting a report and passing the oral defense		2
		Individuals awarded “Active Participant” / Teams awarded “Excellent Performance” by HUST or Hubei Youth League Committee		2
3	English Qualifications	CET-6	Students whose Band-6 exam scores passed university requirements	2
		TOEFL	Above 90	2
		IELTS	Above 6.5	2
		GRE	Above 325	2
		National College Student Spoken English Test	A、B、C	3、2、1
4	Computer Proficiency	National Computer Rank Examination	Holder of the Certificate of Band-2 or higher	2
		National Computer Software Qualification、Proficiency Test	Holder of the Certificate of programmer	2
			Holder of the Certificate of Advanced Programmer	3
			Holder of the Certificate of System Analyst	4
5	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
6	Academic papers	Published in National-level Journals	Each Paper	2~3
7	Research Programs	Contribution and Research Capability	Each Program	1~3
		Undergraduate Innovation and Entrepreneurship Project	Pass	2
8	Experiments	Innovation Capacity	Each Experiment	1~3
9	Labor Education Courses	Participation of voluntary labor or service should be more than 32 class hours		2

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### （一）主要课程 Main Courses

电路理论 Circuit Theory、模拟电路与数字系统（一、二）Analog Circuit and Digital System（I、II）、信号与线性系统 Signal and Linear System、数字信号处理 Digital Signal Processing、通信原理 Principles of Communications、通信电子线路 Electronic Circuits of Communications、电磁场与微波技术 Electromagnetic Field and Microwave Engineering、数据结构 Data Structure、微机原理 Principles of Microcomputer。

#### （二）创新创业课程 Innovation (Entrepreneurship) Courses

技术创业 Technological Entrepreneurship。

## 八、主要实践教学环节（含专业实验）

### VIII. Practicum Module (experiments Included)

电子线路设计·测试·实验（一、二）Electronic Circuit Design, Test and Experiments（I、II）、工程训练 Engineering Training、项目实践 Research and Project Task。

## 九、教学进程计划表

### IX. Course Schedule

院（系）：电子信息与通信学院

专业：电子信息工程

School (Department) : School of Electronic Information and Communications

Major: Electronics and Information Engineering

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 Hrs	学分 Crs	其中 including		学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Laws	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 Hrs	学分 CrS	其中 including		学期 semester
						实验 exp.	上机 operation	
Essential- General Courses 素质教育通识课程	必修 Required	PHE0022	大学体育（三） Physical Education（III）	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	EIC0011	计算机与程序设计基础（C） Fundamental of Computer Programming（C）	56	3.5			1
	选修 Elective	GEC1071	批判性思维 Critical Thinking	24	1.5			5
	选修 Elective		从不同的课程模块中修读若干课程，美育类、大学生心理健康课程均不低于 2 学分，总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-Related Courses	必修 Required	MAT0551	微积分（一）（上） Calculus（I）	88	5.5			1
	必修 Required	MAT0531	微积分（一）（下） Calculus（II）	88	5.5			2
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physics Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physics Experiments（II）	24	0.75	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0561	复变函数与积分变换 Complex Functions and Integral Transforms	40	2.5			2
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Mathematical Equations and Functions	40	2.5			4
	必修 Required	EEE0641	电路理论（三） Circuit Theory（III）	64	4			2
	必修 Required	EEE0671	电路测试实验 Circuit Measurement Experiments	32	1	32		3
	必修 Required	EIC0671	信号与线性系统（二） Signal and Linear System（II）	64	4	16		4
	必修 Required	EIC0581	模拟电路与数字系统（一） Analog Circuit and Digital System（I）	48	3			3
	必修 Required	EIC0561	模拟电路与数字系统（二） Analog Circuit and Digital System（II）	48	3			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 Hrs	学分 Crs	其中 including		学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-related Courses	必修 Required	EIC0551	电子线路设计、测试及实验 (一) Electronic Circuitry Design, Test and Experiments (I)	32	1	32		3
	必修 Required	EIC0541	电子线路设计、测试及实验 (二) Electronic Circuitry Design, Test and Experiments (II)	32	1	32		4
	必修 Required	EIC0612	计算机网络 Computer Networks	32	2			5
	必修 Required	EIC5631	信息技术导论 Introduction to Information Technologies	24	1.5			1
专业核心课程 Specialty Core Courses	必修 Required	EIC2081	数据结构 Data Structure	48	3			2
	必修 Required	EIC2101	随机过程 Stochastic Process	32	2			4
	必修 Required	EIC2221	电磁场与微波技术 Electromagnetic Field and Microwave Engineering	48	3			5
	必修 Required	EIC2052	通信电子线路 Electronic Circuits of Communications	48	3	8		5
	必修 Required	EIC2091	数字信号处理 Digital Signal Processing	48	3	8		5
	必修 Required	EIC2072	基础信息论 Fundamentals of Information Theory	24	1.5			4
	必修 Required	EIC2111	通信原理 Principles of Communications	56	3.5	8		5
	必修 Required	EIC0131	Linux 操作系统 Linux Operating System	48	3			6
	必修 Required	EIC2171	微机原理 Principles of Microcomputer	48	3			5
	必修 Required	EIC2181	嵌入式系统原理与设计 Principles and Design of Embedded Systems	48	3			5
专业选修课程 Specialty-oriented Courses	选修 Elective	EIC5481	数字图像处理 Digital Image Processing	48	3	8		6
	选修 Elective	EIC5371	网络与信息安全 Network and Information Security	32	2			6
	选修 Elective	EIC5581	无线通信基础 Fundamentals of Wireless Communications	32	2			6
	选修 Elective	EIC6051	深度学习与计算机视觉 Deep Learning and Computer Vision	32	2			7
	选修 Elective	EIC2191	技术创业 Technological Entrepreneurship	32	2			7
	选修 Elective	EIC5861	SOC 软硬件协同设计 SOC Software/Hardware Co-Design	48	3			6
	选修 Elective	EIC5881	软件工程与项目管理 Software Engineering	32	2			5
	选修 Elective	EIC5891	商业企业管理基础 Foundation of Business and Commercial Management	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 Hrs	学分 Crs	其中 including		学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3541	工程训练（三） Engineering Training（III）	2w	1			4
	必修 Required	EIC3601	工程训练（一） Engineering Training（I）	6w	3			5
	必修 Required	EIC3611	工程训练（二） Engineering Training（II）	10w	5			6
	必修 Required	EIC3591	项目实践 Research and Project Task	16w	8			7
	必修 Required	EIC3511	毕业设计（论文） Undergraduate Thesis	16w	8			8

## 网络空间安全学院

华中科技大学在上世纪 80 年代就建立了信息安全实验室，在多年积累信息安全教学和研究实践经验的基础上，于 2002 年建立了信息安全专业，同年设立硕士、博士学位授予点，2003 年招收首届本科生和硕士、博士研究生，是国内较早成立本专业的高校之一。2007 年成为国内首批“信息安全特色专业”，2016 年 2 月获得首批“网络空间安全”一级学科博士点授予权。

2016 年学校积极响应国家战略部署，成立网络空间安全学院。秉执参与国际竞争的历史使命与培养人才的教育使命，学院以建设“一流网络安全学院”为目标，以“德才兼备、软硬兼修、特色强院、学科一流”为办学方针。近几年来，在人才培养方面实施“分级通关”综合实践能力培养方案，是目前国内唯一在本科教学中系统性推行综合实践能力培养的学校。在科研方面，牵头了包括 973 计划项目“云计算安全基础理论与方法研究”、国家自然科学基金重点项目、科技部网络空间安全重点专项课题等多个国家重要项目；在平台建设方面，在依托现有国家、省部级相关平台外，建设有大数据安全湖北省工程研究中心，成立武汉网络安全战略与发展研究院，作为国家网安基地的智库和产业创新源头。在学术交流方面，打造了国内知名品牌的华中科技大学网络空间安全喻园青年科学家论坛，出版网络空间安全前沿科技发展报告；积极承办全国人才培养与学科建设会议以及全国网络空间安全创新能力大赛等，在学界和业界具有较高的声誉。

2017 年，华中科技大学与国家网络安全人才与创新基地签订战略合作协议，共同打造极具特色的“网络安全学院+网络安全产业谷”模式，是目前国内唯一的国家网络安全人才与创新基地建设的核心单位之一。位于基地的新院区正按照“21 世纪国际一流大学建筑的标杆”目标设计建造，基地顶尖的共享设施与产业园区将为我院的人才培养、科研创新、社会服务等提供优越的发展环境。

网络空间安全一级学科下设基础理论与密码学、网络安全、系统安全和应用安全

#### 4 个研究方向:

基础理论与密码学。研究传统密码学、现代密码学、量子密码学和后量子密码学等领域的算法设计、分析和应用；研究信息论、博弈论、网络空间安全建模和访问控制安全模型的基础理论知识；研究新兴计算模式下基于密码学的数据安全机制与方法。

网络安全。研究网络威胁、脆弱性、安全风险及网络态势感知相关技术；研究网络安全防护体系的设计与实现，网络对抗，网络安全漏洞的发掘，网络接入安全、传输安全、安全协议的设计与实现、网络攻击检测与防御技术；研究移动互联网和工业物联网安全。

系统安全。研究操作系统、数据库管理系统、云计算与虚拟化计算平台的安全技术和评估方法；研究可信计算机和可信计算系统的架构与实现技术；研究嵌入式系统安全、芯片安全和计算机各组成部件和外设的安全；研究恶意代码检测、病毒传播模型和防范技术、软件逆向技术。

应用安全。研究信息系统中数据存储、传输和使用的安全性，信息系统运行安全，多媒体安全，大数据安全，区块链技术，数据备份、恢复与应急响应；研究电子政务、电子商务和物联网系统中的安全问题；研究工业控制、智能制造、自动化生产、电子设备和各行业领域中安全控制、安全管理、安全测评和态势分析等技术与方法。



## 网络安全专业本科培养计划

### Undergraduate Program for Specialty in Cyberspace Security

#### 一、培养目标

##### I . Educational Objectives

本专业面向国家网络空间安全战略，培养德、智、体、美、劳全面发展，掌握自然科学、人文社会、信息科学和法律法规的基础知识，系统掌握网络空间安全的基本理论和关键技术，具有较强的法律意识和安全保密观念，具有网络空间安全领域较强的科学研究能力、工程实践能力与创新意识，具有国际视野和跟踪网络空间安全前沿领域发展的洞察力，具有团队合作精神、组织管理能力和终生学习能力的网络空间安全专业高素质复合型人才。培养的毕业生能从事计算机领域、网络空间安全领域、通信领域相关的应用、研究、设计、开发和管理等工作。毕业五年左右可成为单位、领域或行业的技术骨干或业界精英。

目标 1：具有良好的思想道德修养、科学文化素质、职业道德和社会责任感，熟悉并遵守网络安全政策法规；

目标 2：具有良好的应用、研究和创新能力，能够在跨学科跨领域工程背景下进行网络空间安全系统的规划、设计、开发和管理；

目标 3：具有国际化视野和管理决策能力，能够在多学科多文化合作团队中计划、组织、协调和指挥；

目标 4：具备在职业工作和社会环境中自主学习和适应的能力，能够适应行业发展，创新创业意识强。

Facing the national cyberspace security development strategy, students should be high-quality talents majoring in cyberspace security, who have comprehensive self-development in different areas including moral, intelligence, health, art and labor, master the basic knowledge of natural science, humanities and society, information science and laws and regulations, systematically master the basic theories and key technologies of cyberspace security, have strong legal awareness and concept of security and confidentiality, have strong scientific research ability, engineering practice ability and innovation consciousness in the field of cyberspace security, have international vision and insight into the development of frontier areas of cyberspace security, have teamwork spirit, organizational management ability and lifelong learning ability. The graduates trained should engage in application, research, design, development and management in computer science, cyberspace security and communication-related fields. After five years of graduation, the students should become technical backbones or industry elites in organizations, fields or industries.

Goal 1: Having good ideological and moral cultivation, scientific and cultural quality, professional ethics and social responsibility, being familiar with and abiding by policies and regulations related to cyberspace security;

Goal 2: Having good application, research and innovation capabilities, and being able to plan, design, develop and manage cyberspace security systems in the context of interdisciplinary and interdisciplinary engineering;

Goal 3: Having an international vision and management decision-making ability, and being able to plan, organize, coordinate and command in a multidisciplinary and multicultural cooperative team;

Goal 4: Having the ability to learn and adapt independently in the professional work and social environment, being able to adapt to the development of the industry, and having a strong sense of innovation and entrepreneurship.

## 二、基本规格要求

### II. Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

Graduates should acquire knowledge and competence in the following areas:

1. 工程知识：具备数学、自然科学、工程基础和网络空间安全专业知识，并能用于解决网络空间安全领域复杂工程问题。

1. Engineering knowledge: the knowledge of mathematics, natural science, engineering foundation and cyberspace security, as well as the ability to apply this knowledge to solve complex engineering problems in cyberspace security.

2. 问题分析：能够应用数学、自然科学、工程科学和计算机科学的基本原理，识别、表达，以及通过文献研究分析网络空间安全领域复杂工程问题，以获得有效结论。

2. Problem analyses: the ability to apply fundamental principles of mathematics, natural sciences, engineering sciences, and computer science to identify, express, and analyze complex engineering problems in cyberspace security through literature research, and the ability to obtain effective conclusions.

3. 设计/开发解决方案：能够设计针对网络空间安全领域复杂工程问题的解决方案，包括满足特定需求的系统、单元（模块）或开发（算法）流程，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Designing/Developing solution: the ability to design solutions to complex engineering problems in cyberspace security, including systems, units (modules), or development (algorithmic) processes that meet specific needs, and the ability to reflect innovative awareness and take the social, health, safety, legal, cultural and environmental factors into consideration during the design.

4. 研究：能够基于科学原理、科学方法和专业知识对网络空间安全领域复杂工程问题进行研究，通过实验设计与仿真、数据分析与解释并通过信息综合得到合理有效的结论。

4. Research: being able to study cyberspace security issues based on scientific principles, scientific methods, and professional knowledge, including constructing algorithms, designing experiments, analyzing and interpreting data, and obtaining effective conclusions through information synthesis.

5. 使用现代工具：能够针对网络空间安全领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，进行设计、预测、模拟与实现，并能够理解其局限性。

5. Using advanced tools: being able to select appropriate development tools, development models, and testing techniques in actual cryptographic engineering activities, and flexibly use various modern tools to design, simulate and implement cyberspace security problems, and being able to understand the limitations of different tools.

6. 工程与社会：能够基于网络空间安全工程相关背景进行合理分析，评价网络空间安全专业工程实践和网络空间安全领域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. Engineering and society: being able to conduct a reasonable analysis based on the relevant background knowledge of this major, evaluate the impact of the scientific and engineering problem solutions of the major on the society, health, safety, law, and culture, and understand the

responsibilities that should be undertaken.

7. 环境和可持续发展：在网络空间安全领域复杂工程实施过程中具有可持续发展理念，能够理解和评价针对网络空间安全领域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. Environment and sustainable development: having a sustainable development concept in the practice of cyberspace security, being able to understand and evaluate the impact of professional engineering practices aimed at cyberspace security issues on environmental protection and sustainable social development.

8. 职业规范：具有良好的人文社会科学素养、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. Professional norms: having a good sense of humanities and social sciences, social responsibility, and the ability to understand and comply with engineering professional ethics and norms in engineering practice and fulfill their responsibilities.

9. 个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individuals and team: having the team spirit and team skills to assume the role of individual, team member and leader in a multidisciplinary context.

10. 沟通：能够就网络空间安全领域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。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。

10. Communication: having the ability to communicate and interact effectively with industry peers and the public on cyberspace security issues, including writing reports and design briefs, presenting statements, and articulating or responding to instructions, having international perspective and the ability to communicate and interact in a cross-cultural context.

11. 项目管理：理解并掌握基本的工程管理原理和经济决策方法，具备一定的工程项目规划与管理能力，能够在多约束条件下进行经济高效的管理决策，并进一步在 multidisciplinary 环境中应用。

11. Project management: being able to understand and master basic engineering management principles and economic decision-making methods, having engineering project planning and management skills, and being able to make economic and efficient management decisions under multiple constraints and to further apply them in a multidisciplinary environment.

12. 终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Lifelong learning: having a sense of self-directed and lifelong learning, with the ability to continuously learn and adapt to development.

### 三、培养模式与特色

#### III. Teaching Model and Characteristics

##### 1. 培养模式

##### 1. Teaching Model

为实现网络空间安全学科高端人才培养目标，充分发挥“国家网络安全人才与创新基地”（以下简称“基地”）软硬件设施作用，建立“一院两地、分段实施，多方协同”综合培养模式。学生进校后实施 2+2 的分段培养模式，即本科 2 年在学校本部学习，2 年在基地学习与实践，在基地与学校协同下，完成最终培养目标。

In order to achieve the educational objectives of high-end talents of cyberspace security, the school of Cyberspace Science and Engineering of Huazhong University of Science and Technology

(HUST) gives full play to the roles of the software and hardware facilities of the National Cybersecurity Center For Education and Innovation (NCC), coordinates the educational resources, and builds the integrated education model of “two sites for one school, phased implementation and multipartite coordination”. After entering the school, students will participate in a 2+2 staged training model, that is, two years of undergraduate study in the main campus of HUST and two years of study and practice in NCC. The whole training goal will be achieved with the collaboration between NCC and HUST.

## 2. 培养特色

### 2. Teaching Characteristics

以数理和计算机科学为基础，以网络空间安全为目标，以网络和系统体系结构安全为核心，以计算机网络、通信网络及各类融合系统的体系和结构中的安全问题为主线，形成全域网络空间安全的专业人才培养体系。以产教协同为引擎，通过系列化的综合实践类课程和研究设计类课程，强化网络空间安全综合实践能力和创新能力，培养具有良好科学素养、研究能力和组织管理能力的工程技术与科研人才。

Based on mathematics and computer science, aiming at cyberspace security, taking network and system architecture security as the core, and taking the security issues in the system and structure of computer networks, communication networks and various fusion systems as the main line, forming a professional talent training system for global cyberspace security. Taking industry-education collaboration as the engine, through a series of comprehensive practical courses and research/design courses, strengthening the comprehensive practical ability and innovation ability of cyberspace security, and cultivate engineering technology and scientific research talents with good scientific literacy, research ability and organizational management ability.

## 四、主干学科

### IV. Major Disciplines

网络空间安全

Cyberspace Security

## 五、学制与学位

### V. Length of Schooling and Degree

修业年限：四年

Length of Schooling: Four Years

授予学位：工学学士

Degree Conferred: Bachelor of Engineering

## 六、学时与学分

### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：151.75

Minimum Required Curricular Credits (incl. course system and intensive practical training): 151.75

完成学业最低课外学分要求：5

Minimum Required Extracurricular Credits: 5

### 1. 课程体系学时与学分

Hours and Credits in the Course System

华中科技大学 2022 级本科专业培养计划

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
通识教育基础课程		必修	588/30	19.9
		选修	160/10	5.4
学科大类基础课程		必修	864/48.75	29.2
专业课程	专业核心课程	必修	464/25.5	15.7
	专业方向课程	选修	320/20	10.8
集中性实践教学环节		必修	35w/17.5	18.9
合计			2396+35w/151.75	100
其中, 总实验(实践)学时及占比			280+35w	28.4

Course Classified		Course Nature	Hrs/Crs	Hrs Percentage (%)
Basic Courses in General Education		Required	588/30	19.9
		Elective	160/10	5.4
Basic Courses in General Discipline		Required	864/48.75	29.2
Courses in Specialty	Common Core Courses	Required	464/25.5	15.7
	Specialty-Oriented Courses	Elective	320/20	10.8
Internship and Practical Training		Required	35w/17.5	18.9
Total			2396+35w/151.75	100
Practicum Credits			280+35w	28.4

2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensive Practical Teaching

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5.7
工程训练	必修	2/1	5.7
综合实践	必修	8/4	22.9
生产实习(社会实践)	必修	3/1.5	8.6
课程设计	必修	6/3	17.1
毕业设计(论文)	必修	14/7	40
合计		35/17.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.7
Electrical Engineering Practice	Required	2/1	5.7
Comprehensive practice	Required	8/4	22.9
Engineering Internship (Social Practice)	Required	3/1.5	8.6
Course Project	Required	6/3	17.1
Undergraduate Thesis	Required	14/7	40
Total		35/17.5	100

3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动及创新创业	思政课社会实践（必修）：提交社会调查报告，通过答辩者		2
		创新创业项目	国家级立项并结题	6
			省级立项并结题	4
			校级立项并结题	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
2	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		CSP 考试	200-500 分	2~5

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
2	英语及计算机考试	全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
3	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
4	论文	在国内外学术期刊或国际学术会议上发表高水平论文	视每篇论文质量	2~6
5	科研	视参与科研项目时间与科研能力	每项	1~3
6	实践成果	创新创业成果、授权专利、专业认证证书、有编号漏洞等	每项成果等级	1~3
7	公益活动	为学校、学院组织的大型活动提供服务，工程体验	每单元时间	0.5~2
8	劳动教育（必修）	完成学校和学院制定的劳动活动（必修）	考核合格	2

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。劳动活动为学生毕业必备条件的必修课外课程。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice and Innovation & Entrepreneurship	Submit social survey reports and pass oral defense		2
		Projects of Innovation & Entrepreneurship	National Level Project Established and Completed	6
			Provincial Level Project Established and Completed	4
			University Level Project Established and Completed	2
		Win the honor of the Activist of Social Practice by the Communist Youth League of HUST or Hubei Province; Membership of the group which wins the honor of the Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	English and Computer Tests	CET-6 (College English Test Band 6)	Achieving required results of the university	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CSP	200-500 Points or Higher	2-5
		National Computer Software Qualification and Proficiency Test	Certificate of Programmer	2
			Certificate of Advanced Programmer	3
			Certificate of System Analyst	4
3	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
3	Competitions	National Level	First Prize	6
			Second Prize	4
			Third Prize	3
4	Academic papers	High-level academic papers published in national or international journals or international academic conferences	Depending on the quality per paper	2~6
5	Scientific Research	Depending on the time spent in and ability demonstrated in scientific research projects	Per item	1~3
6	Experiment Achievements	Innovation and entrepreneurship achievements, authorized patents, professional certification certificates, numbered vulnerability, etc.	Per item	1~3
7	Volunteer Service	Provide services for large-scale activities organized by university and college	Per unit time	0.5~2
8	Labor Courses	Complete the labor courses set by the school and university	Pass the assessment	2

Note: The first and the second places, the third to fifth places and the sixth to eight places on the sports meetings of HUST are equivalent to the first prize, the second prize and the third prize at the university level, respectively. The labor courses are required courses for students to graduate.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

离散数学 Discrete Mathematics、汇编语言程序设计 Assembly Language Programming、C 语言程序设计 C Programming、数据结构 Data Structure、操作系统原理 Operating Systems、密码学原理 Principle of Cryptography、系统安全 System Security、计算机通信与网络 Computer Communications & Network、计算机网络安全 Computer Network Security、信号与线性系统 Signal and Liner System、通信原理与通信安全 Principles & Security of Communication

#### (二) 创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Enlightenment of Innovation Consciousness Courses：信息技术导论 Introduction to Information Technology

创新能力培养类课程 Cultivation of Innovative Ability Courses：网络空间安全综合实践（I） Comprehensive practice of Cyberspace Security（I）、网络空间安全综合实践（II） Comprehensive practice of Cyberspace Security（II）、网络空间安全综合实践（III） Comprehensive practice of Cyberspace Security（III）

创新实践训练类课程 Innovative Practice Training Courses：网络空间安全综合实践（IV） Comprehensive practice of Cyberspace Security（IV）、网络空间安全综合实践（V） Comprehensive practice of Cyberspace Security（V）

## 八、主要实践教学环节

### VIII. Main Internship and Practical Training

网络与系统安全课程设计 Course Project of Network and System Security、操作系统课程设计 Course Project of Operating Systems、程序设计综合课程设计 Course Project of Programming、网络空间安全综合实践（I） Comprehensive practice of Cyberspace Security（I）、网络空间安全

综合实践 ( II ) Comprehensive practice of Cyberspace Security ( II )、网络空间安全综合实践 ( III )  
 Comprehensive practice of Cyberspace Security ( III )、网络空间安全综合实践 ( IV ) Comprehensive  
 practice of Cyberspace Security ( IV )、网络空间安全综合实践 ( V ) Comprehensive practice of  
 Cyberspace Security ( V )、生产实习 Engineering Internship、毕业设计 ( 论文 ) Undergraduate  
 Thesis 。

## 九、教学进程计划表

### IX. Table of Teaching Schedule

院 ( 系 ) : 网络空间安全学院

专业: 网络空间安全

School ( Department ) : School of Cyber Science & Engineering

Major: Cyberspace Security

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
通识教育基础课程 basic courses in general education	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Theory of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Current Affairs and Policy	48	1.5			2-4
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语 ( 一 ) Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 ( 二 ) Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育 ( 一 ) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 ( 二 ) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育 ( 三 ) Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	选修 Elective		从不同的课程模块中修读若干课程, 美育类课程 不低于 2 学分, 《大学生心理健康》必修, 经济 管理类课程不低于 2 学分, 总学分不低于 10 学分。 General Education Courses ( elective )	160	10			1-4
学科大类基础 Basic Courses in General Discipline	必修 Required	CST5391	信息技术导论 Introduction to Information Technology	24	1.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础 Basic Courses in General Discipline	必修 Required	SCS0051	C 语言程序设计 Advanced Programming Language (C)	32	2			1
	必修 Required	SCS0061	C 语言程序设计实验 Advanced Programming Language (C) Experiments	48	1.5	48		1
	必修 Required	MAT0551	微积分 (一) 上 Calculus (I)	88	5.5			1
	必修 Required	MAT0531	微积分 (一) 下 Calculus (I)	88	5.5			2
	必修 Required	PHY0511	大学物理 (一) Physics (I)	64	4			2
	必修 Required	PHY0551	物理实验 (一) Physical Experiments (I)	32	1	32		2
	必修 Required	SCS0521	离散数学 (一) Discrete Mathematics (I)	40	2.5			2
	必修 Required	SSE0561	数据结构 Data Structure	48	3			2
	必修 Required	CST2271	数据结构实验 Data Structure Experiments	16	0.5	16		2
	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.75	24		3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			3
	必修 Required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			3
	必修 Required	CST0561	计算机通信与网络实验 Computer Telecommunications & Network Experiments	16	0.5	16		3
	必修 Required	CST2081	汇编语言程序设计 Assembly Language Programming	24	1.5			3
	必修 Required	CST2101	汇编语言程序设计实验 Assembly Language Programming Experiments	16	0.5	16		3
	必修 Required	SCS0531	离散数学 (二) Discrete Mathematics (II)	40	2.5			3
	必修 Required	SCS0091	网络空间安全数学基础 Foundation of Cyber Security Mathematics	32	2			4
	必修 Required	SCS0101	算法设计与分析 Algorithmic Design and Analysis	48	2.5	16		5
专业课程 Specialty Required Courses	必修 Required	SCS2011	数字电路与逻辑设计 Digital Circuit and Logic Design	32	2			4
	必修 Required	SCS2021	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5	16		4
	必修 Required	SCS0111	信号与线性系统 Signal and Linear System	48	3			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业 课程 专业核心课程 Specialty Required Courses	必修 Required	SCS0121	密码学原理 Principle of Cryptography	32	2			4
	必修 Required	SCS2032	计算机组成原理 Computer Organization	40	2.5			4
	必修 Required	SCS2041	计算机组成原理实验 Computer Organization Experiments	16	0.5	16		4
	必修 Required	CST2031	操作系统原理 Operating System	40	2.5			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5	16		5
	必修 Required	SCS0131	系统安全 System Security	48	3			5
	必修 Required	SCS0141	系统安全实验 System Security Experiments	16	0.5	16		5
	必修 Required	SCS2101	计算机网络安全 Computer Network Security	32	2			5
	必修 Required	CST2121	计算机网络安全实验 Computer Network Security Experiments	16	0.5	16		5
	必修 Required	SCS2151	通信原理与通信安全 Principles & Security of Communication	48	3			6
	必修 Required	SCS0151	通信原理与通信安全实验 Communication Principles and Communication Security Experiments	16	0.5	16		6
	必修 Required	CST2011	编译原理 Compiler Principles	32	2			6
	必修 Required	CST0321	编译原理实验 Compiler Principles Experiments	16	0.5	16		6
			要求选修学分不少于 20 学分					
专业 选修课程 Specialty-oriented Courses			A 组选修课（不少于 16 学分）					
	选修 Elective	CST0271	计算机基础 Computational Thinking	32	2	16		2
	选修 Elective	CST2281	数据库系统原理 Database System	48	3	16		3
	选修 Elective	CST5221	逆向工程分析技术 Reverse Engineering Technology	32	2	8		5
	选修 Elective	SCS5051	区块链技术及应用 Blockchain Technology and Application	24	1.5			5
	选修 Elective	SCS0161	CTF 攻防实践 Comprehensive Practice of CTF	32	1	32		5
	选修 Elective	CST5341	无线网络安全 Wireless Network Security	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 elective	SCS5021	认证与访问控制 Access Control	24	1.5			6
	选修 Elective	SCS0171	云计算安全 Cloud Security	24	1.5			6
	选修 Elective	SCS5161	移动通信原理 Principles of Mobile Communication	32	2			6
	选修 Elective	SCS5171	通信编码安全理论 Security Theory of Communication Coding	32	2			6
	选修 Elective	SCS5142	物联网安全与隐私保护 IOT Security and Privacy Protection	32	2	8		6
	选修 Elective	SCS0071	移动应用安全 Mobile App Security	24	1.5			7
	选修 Elective	CST5321	网络安全程序设计 Network Security Programming	32	2	8		7
	选修 Elective	SCS0251	多天线通信理论与技术 Multi Antenna Communication Theory and Technology	32	2			7
	选修 Elective	SCS0001	多载波通信技术 Multicarrier Communication Technology	32	2			7
	选修 Elective	SCS3592	网络空间安全综合实践 (V) Comprehensive practice of Cyberspace Security (V)	2w	1			7
	选修 Elective	SCS5031	程序分析与安全 Program Analysis for Security	24	1.5			7
			B 组选修课					
	选修 Elective	SCS0181	ACM 算法实践 Practice of ACM Algorithm	32	1	32		2
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	SCS5081	硬件描述语言与数字系统设计 Hardware Description Language and Digital System Design	32	2	8		4
	选修 Elective	SCS5071	计算方法 Numerical Analysis	32	2			4
	选修 Elective	SCS5111	密码协议基础 Cryptographic Protocol	32	2			5
	选修 Elective	CST5331	网络取证 Network Forensic	32	2	16		6
	选修 Elective	CSS5042	游戏设计与安全 (腾讯游戏客户端安全精英班) Game Design and Game Security	16	1			6
	选修 Elective	CST5201	可信计算 Trusted Computing	32	2	8		6
	选修 Elective	SCS5061	多媒体数据安全 Multimedia Security	32	2	8		6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	SCS0191	云容器安全（青藤云菁英班） Cloud Container Security	16	1			6
	选修 Elective	SCS0241	机器学习 Machine Learning	24	1.5			7
	选修 Elective	SCS5092	芯片安全与测试技术导论 Introduction to Chip Security and Test Methods	24	1.5			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2w	1			3
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			4
	必修 Required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1			6
	必修 Required	CST3601	生产实习 Engineering Internship	3w	1.5			7
	必修 Required	SCS0201	网络与系统安全课程设计 Course Project of Network & System Security	2w	1			6
	必修 Required	SCS3511	网络空间安全综合实践（I） Comprehensive Practice of Cyberspace Security (I)	2w	1			2
	必修 Required	SCS3522	网络空间安全综合实践（II） Comprehensive Practice of Cyberspace Security (II)	2w	1			4
	必修 Required	SCS3532	网络空间安全综合实践（III） Comprehensive Practice of Cyberspace Security (III)	2w	1			5
	必修 Required	SCS3542	网络空间安全综合实践（IV） Comprehensive Practice of Cyberspace Security (IV)	2w	1			6
	必修 Required	CST3511	毕业设计（论文） Undergraduate Thesis	14w	7			8

## 信息安全专业本科培养计划

### Undergraduate Program for Specialty in Information Security

#### 一、培养目标

##### I . Educational Objectives

本专业面向国家网络空间安全战略，培养德、智、体、美、劳全面发展，掌握自然科学、人文社会、信息科学和法律法规的基础知识，系统掌握信息安全的基本理论、关键技术和应用知识，具有法律意识和安全保密观念，具备信息安全领域较强的科学研究能力、工程实践能力与创新意识，具有国际视野和跟踪信息安全前沿领域发展的洞察力，具有团队合作精神、组织管理能力和终生学习能力的信息安全专业高素质复合型人才。培养的毕业生能够从事计算机领域、信息安全领域相关的应用、研究、设计、开发和管理等方面的工作。毕业五年左右可成为单位、领域或行业的技术骨干或业界精英。

目标 1：具有良好的思想道德修养、科学文化素质、职业道德和社会责任感，熟悉并遵守网络安全政策法规；

目标 2：具有良好的应用、研究和创新能力，能够在跨学科跨领域工程背景下进行信息安全系统的规划、设计、开发和管理；

目标 3：具有国际化视野和管理决策能力，能够在多学科多文化合作团队中计划、组织、协调和指挥；

目标 4：具备在职业工作和社会环境中自主学习和适应的能力，能够适应行业发展，创新创业意识强。

Facing the national cyberspace security development strategy, students should be high-quality talents majoring in information security, who have comprehensive self-development in different areas including moral, intelligence, health, art and labor, master the basic knowledge of natural science, humanities and society, information science and laws and regulations, systematically master the basic theories, key technologies and application knowledge of information security, have strong legal awareness and concept of security and confidentiality, have strong scientific research ability, engineering practice ability and innovation consciousness in the field of information security, have international vision and insight into the development of frontier areas of information security, have teamwork spirit, organizational management ability and lifelong learning ability. The graduates trained should engage in application, research, design, development and management in computer science and information security -related fields. After five years of graduation, the students should become technical backbones or industry elites in organizations, fields or industries.

Goal 1: Having good ideological and moral cultivation, scientific and cultural quality, professional ethics and social responsibility, being familiar with and abiding by policies and regulations related to information security;

Goal 2: Having good application, research and innovation capabilities, and being able to plan, design, develop and manage information security systems in the context of interdisciplinary and interdisciplinary engineering;

Goal 3: Having an international vision and management decision-making ability, and being able to plan, organize, coordinate and command in a multidisciplinary and multicultural cooperative team;

Goal 4: Having the ability to learn and adapt independently in the professional work and social environment, being able to adapt to the development of the industry, and having a strong sense of innovation and entrepreneurship.

## 二、基本规格要求

### II. Learning Outcomes

本专业毕业生要求较好地掌握工科公共基础知识，较为系统地掌握信息安全基础理论知识和专业核心知识，初步具备综合运用基础理论和技术手段分析并解决复杂工程问题的能力；具备运用现代信息技术获取相关信息的能力；具有基本的外语应用能力；具有一定的国际视野和跨文化交流能力；具有一定的管理能力和团队合作精神；了解本专业的发展趋势，对前沿的知识和技术有较敏锐的洞察力；具备较好的终身学习能力。

Graduates of this major are required to have a good grasp of the public basic knowledge of engineering, systematically master the basic theoretical knowledge and professional core knowledge of information security, and initially have the ability to comprehensively use basic theories and technical means to analyze and solve complex engineering problems, have the ability to use modern information technology to obtain relevant information, have basic foreign language application ability, have a certain international vision and cross-cultural communication ability, have certain management ability and teamwork spirit, understand the development trend of this major, have a keen insight into cutting-edge knowledge and technology, and have lifelong learning ability.

根据培养目标与专业定位，本专业的基本毕业要求如下：

According to the training objectives and professional orientation, the basic graduation requirements of this major are as follows:

1、工程知识：具备数学、自然科学、工程基础和信息安全专业知识，并能用于解决信息安全复杂工程问题。

1. Engineering knowledge: the knowledge of mathematics, natural science, engineering foundation and information security, as well as the ability to apply this knowledge to solve complex engineering problems in information security.

2、问题分析：能够应用数学、自然科学、工程科学和计算机科学的基本原理，识别、表达，以及通过文献研究分析信息安全复杂工程问题，以获得有效结论。

2. Problem analyses: the ability to apply fundamental principles of mathematics, natural sciences, engineering sciences, and computer science to identify, express, and analyze complex engineering problems in information security through literature research, and the ability to obtain effective conclusions.

3、设计开发解决方案：能够设计针对信息安全复杂工程问题的解决方案，包括满足特定需求的系统、单元（模块）或开发（算法）流程，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Designing/Developing solution: the ability to design solutions to complex engineering problems in information security, including systems, units (modules), or development (algorithmic) processes that meet specific needs, and the ability to reflect innovative awareness and take the social, health, safety, legal, cultural and environmental factors into consideration during the design.

4、研究：掌握基本的科学研究与创新方法，能够基于科学原理、科学方法和专业知识对信息安全复杂工程问题进行研究，通过实验设计与仿真、数据分析与解释，并通过信息综合得到合理有效的结论。

4. Research: mastering the basic methods of scientific research and innovation, being able to study

information security issues based on scientific principles, scientific methods, and professional knowledge, including constructing algorithms, designing experiments, analyzing and interpreting data, and obtaining effective conclusions through information synthesis.

5、使用现代工具：能够针对信息安全复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，进行设计、预测、模拟与实现，并能够理解其局限性。

5. Using advanced tools: being able to select appropriate development tools, development models, and testing techniques in actual cryptographic engineering activities, and flexibly use various modern tools to design, simulate and implement information security problems, and being able to understand the limitations of different tools.

6、工程与社会：能够基于信息安全工程相关背景进行合理分析，评价信息安全专业工程实践和信息安全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. Engineering and society: being able to conduct a reasonable analysis based on the relevant background knowledge of this major, evaluate the impact of the scientific and engineering problem solutions of the major on the society, health, safety, law, and culture, and understand the responsibilities that should be undertaken.

7、环境与可持续发展：在信息安全复杂工程实施过程中具有可持续发展理念，能够理解和评价针对信息安全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. Environment and sustainable development: having a sustainable development concept in the practice of information security, being able to understand and evaluate the impact of professional engineering practices aimed at information security issues on environmental protection and sustainable social development.

8、职业规范：具有良好的人文社会科学素养、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. Professional norms: having a good sense of humanities and social sciences, social responsibility, and the ability to understand and comply with engineering professional ethics and norms in engineering practice and fulfill their responsibilities.

9、个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individuals and team: having the team spirit and team skills to assume the role of individual, team member and leader in a multidisciplinary context.

10、沟通：能够就信息安全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。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。

10. Communication: having the ability to communicate and interact effectively with industry peers and the public on information security issues, including writing reports and design briefs, presenting statements, and articulating or responding to instructions, having international perspective and the ability to communicate and interact in a cross-cultural context.

11、项目管理：理解并掌握基本的工程管理原理和经济决策方法，具备一定的工程项目规划与管理能力，能够在多约束条件下进行经济高效的管理决策，并进一步在多学科环境中应用。

11. Project management: being able to understand and master basic engineering management principles and economic decision-making methods, having engineering project planning and management skills, and being able to make economic and efficient management decisions under multiple constraints and to further apply them in a multidisciplinary environment.

12、终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Lifelong learning: having a sense of self-directed and lifelong learning, with the ability to continuously learn and adapt to development.

### 三、培养模式与特色

#### III. Teaching Model and Characteristics

##### 1. 培养模式

###### Teaching Model

为实现网络空间安全学科高端人才培养目标，充分发挥“国家网络安全人才与创新基地”（以下简称“基地”）软硬件设施作用，建立“一院两地、分段实施，多方协同”综合培养模式。学生进校后实施 2+2 的分段培养模式，即本科 2 年在学校本部学习，2 年在基地学习与实践，在基地与学校协同下，完成最终培养目标。

In order to achieve the educational objectives of high-end talents of information security, the school of Cyberspace Science and Engineering of Huazhong University of Science and Technology (HUST) gives full play to the roles of the software and hardware facilities of the National Cybersecurity Center For Education and Innovation (NCC), coordinates the educational resources, and builds the integrated education model of “two sites for one school, phased implementation and multipartite coordination”. After entering the school, students will participant in a 2+2 staged training model, that is, two years of undergraduate study in the main campus of HUST and two years of study and practice in NCC. The whole training goal will be achieved with the collaboration between NCC and HUST.

##### 2. 培养特色

###### Teaching Characteristics

以数理和计算机科学为基础，以信息安全为目标，以数据和内容安全为核心，以数据的传输、存储、处理和访问过程及数据内容中的安全问题为主线，对这些安全问题的根源、现象、解决方法及信息安全新挑战进行学习、研究与实践。以产教协同为引擎，通过系列化的综合实践类课程和研究设计类课程，强化信息安全综合实践能力和创新能力，培养具有良好科学素养、研究能力和组织管理能力的工程技术与科研人才。

Based on mathematics and computer science, aiming at information security, with data and content security as the core, taking the transmission, storage, processing and access of data and security issues in data content as the main line, conducting learning, research and practice on the root causes, phenomena, solutions and new challenges of information security of these problems. Taking industry-education collaboration as the engine, through a series of comprehensive practical courses and research/design courses, strengthening the comprehensive practical ability and innovation ability of information security, and cultivate engineering technology and scientific research talents with good scientific literacy, research ability and organizational management ability

### 四、主干学科

#### IV. Major Disciplines

信息安全 Information Security

### 五、学制与学位

#### V. Length of Schooling and Degree

修业年限：四年

Duration : 4 years



授予学位：工学学士

Degrees Conferred：Bachelor of Engineering

## 六、学时与学分

### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：150.75

Minimum Credits of Curricular (Comprising course system and intensified internship practical training)：150.75

完成学业最低课外学分要求：5

Minimum Extracurricular Credits：5

#### 1. 课程体系学时与学分

Hours/Credits of Course System

课程类别		课程性质	学时/学分	占课程体系学时比例 (%)
通识教育基础课程		必修	588/30	20.0
		选修	160/10	5.4
学科大类基础课程		必修	864/48.75	29.4
专业课程	专业核心课程	必修	400/21.5	13.6
	专业方向课程	选修	368/23	12.5
集中性实践教学环节		必修	35w/17.5	19.0
合计			2380+35w/150.75	100
其中，总实验（实践）学时及占比			280+35w	28.6

Course Classified		Course Nature	Hrs/Crs	Percentage (%)
Basic Courses in General Education		Required	588/30	20.0
		Elective	160/10	5.4
Basic Courses in General Discipline		Required	864/48.75	29.4
Courses in Specialty	Common Core Courses	Required	400/21.5	13.6
	Specialty-Oriented Courses	Elective	368/23	12.5
Internship and Practical Training		Required	35w/17.5	19.0
Total			2380+35w/150.75	100
Practicum Credits			280+35w	28.6

#### 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensified Internship and Practical Training

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5.7
工程训练	必修	2/1	5.7
综合实践	必修	8/4	22.9
生产实习（社会实践）	必修	3/1.5	8.6
课程设计	必修	6/3	17.1
毕业设计（论文）	必修	14/7	40.0
合计		35/17.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.7
Comprehensive practice	Required	2/1	5.7
Electrical Engineering Practice	Required	8/4	22.9
Engineering Internship (Social Practice)	Required	3/1.5	8.6
Course Project	Required	6/3	17.1
Undergraduate Thesis	Required	14/7	40.0
Total		35/17.5	100

## 3. 课外学分

## Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动及创新创业	思政课社会实践（必修）：提交社会调查报告，通过答辩者		2
		创新创业项目	国家级立项并结题	6
			省级立项并结题	4
			校级立项并结题	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
2	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		CSP 考试	200-500 分	2~5
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
3	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
4	论文	在国内外学术期刊或国际学术会议上发表高水平论文	视每篇论文质量	2~6
5	科研	视参与科研项目时间与科研能力	每项	1~3
6	实践成果	创新创业成果、授权专利、专业认证证书、有编号漏洞等	每项成果等级	1~3
7	公益活动	为学校、学院组织的大型活动提供服务，工程体验	每单元时间	0.5~2
8	劳动教育（必修）	完成学校和学院制定的劳动活动（必修）	考核合格	2

注：参加校体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六至第八名者与校级三等奖等同。劳动活动为学生毕业必备条件的必修课外课程。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice and Innovation & Entrepreneurship	Submit social survey reports and pass oral defense		2
		Projects of Innovation & Entrepreneurship	National Level Project Established and Completed	6
			Provincial Level Project Established and Completed	4
			University Level Project Established and Completed	2
		Win the honor of the Activist of Social Practice by the Communist Youth League of HUST or Hubei Province; Membership of the group which wins the honor of the Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	English and Computer Tests	CET-6 (College English Test Band 6)	Achieving required results of the university	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
2	English and Computer Tests	GRE	1350 Points or Higher	3
		CSP	200-500 Points or Higher	2-5
		National Computer Software Qualification and Proficiency Test	Certificate of Programmer	2
			Certificate of Advanced Programmer	3
			Certificate of System Analyst	4
3	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
4	Academic papers	High-level academic papers published in national or international journals or international academic conferences	Depending on the quality per paper	2~6
5	Scientific Research	Depending on the time spent in and ability demonstrated in scientific research projects	Per item	1~3
6	Experiment Achievements	Innovation and entrepreneurship achievements, authorized patents, professional certification certificates, numbered vulnerability, etc.	Per item	1~3
7	Volunteer Service	Provide services for large-scale activities organized by university and college	Per unit time	0.5~2
8	Labor Courses	Complete the labor courses set by the school and university	Pass the assessment	2

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level. The labor courses are required courses for students to graduate.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

离散数学 Discrete Mathematics、汇编语言程序设计 Assembly Language Programming、C 语言程序设计 Advanced Programming Language (C)、密码学原理 Principle of Cryptography、数据结构 Data Structure、计算机通信与网络 Computer Telecommunications & Network、计算机网络安全 Security of Computer Network、计算机组成原理 Computer Organization、操作系统原理 Operating System、软件安全 Software Security、数据与内容安全 Data and Content Security.

#### (二) 创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Enlightenment of Innovation Consciousness Courses：信息技术导论 Introduction to Information Technology

创新能力培养类课程 Cultivation of Innovative Ability Courses：网络空间安全综合实践（I） Comprehensive practice of Cyberspace Security（I）、网络空间安全综合实践（II） Comprehensive

practice of Cyberspace Security ( II ) 、网络空间安全综合实践 ( III ) Comprehensive practice of Cyberspace Security ( III )

创新实践训练类课程 Innovative Practice Training Courses : 网络空间安全综合实践 ( IV ) Comprehensive practice of Cyberspace Security ( IV ) 、网络空间安全综合实践 ( V ) Comprehensive practice of Cyberspace Security ( V )

## 八、主要实践教学环节 (含专业实验)

### VIII. Main Internship and Practical Training (Including Experiments)

操作系统课程设计 Course Project of Operation System、信息与网络安全课程设计 Course Project of Information and Network Security、程序设计综合课程设计 Course Project of Programming、网络空间安全综合实践 ( I ) Comprehensive practice of Cyberspace Security ( I )、网络空间安全综合实践 ( II ) Comprehensive practice of Cyberspace Security ( II )、网络空间安全综合实践 ( III ) Comprehensive practice of Cyberspace Security ( III )、网络空间安全综合实践 ( IV ) Comprehensive practice of Cyberspace Security ( IV )、网络空间安全综合实践 ( V ) Comprehensive practice of Cyberspace Security ( V )、生产实习 Engineering Internship、毕业设计 (论文) Undergraduate Thesis。

## 九、教学进程计划表

### IX. Table of Teaching Schedule

院 (系) : 网络空间安全学院

专业: 信息安全

School (Department) : School of Cyber Science & Engineering

Major: Information Security

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			2-4
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语 (一) Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 (二) Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	PHE0012	大学体育（二） Physical Education（II）	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education（III）	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程, 美育类课程 不低于 2 学分, 心理健康类课程不低于 2 学分, 经济管理类课程不低于 2 学分, 总学分不低于 10 学分 General Education Courses（elective）	160	10			1-4
学科大类基础课程 Basic Courses in General Discipline	必修 Required	SCS0051	C 语言程序设计 Advanced Programming Language（C）	32	2			1
	必修 Required	SCS0061	C 语言程序设计实验 Advanced Programming Language（C） Experiments	48	1.5	48		1
	必修 Required	MAT0551	微积分（一）上 Calculus（I）	88	5.5			1
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	MAT0531	微积分（一）下 Calculus（I）	88	5.5			2
	必修 Required	PHY0551	物理实验（一） Physical Experiments（I）	32	1	32		2
	必修 Required	CST5391	信息技术导论 Introduction to Information Technology	24	1.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			3
	必修 Required	PHY0561	物理实验（二） Physical Experiments（II）	24	0.75	24		3
	必修 Required	SCS0211	信息安全数学基础 Foundation of Information Security Mathematics	32	2			4
	必修 Required	SCS0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			3
	必修 Required	CST0561	计算机通信与网络实验 Computer Telecommunications & Network Experiments	16	0.5	16		3
学科大类基础课程 Basic Courses in General Discipline	必修 Required	SCS0521	离散数学（一） Discrete Mathematics（I）	40	2.5			2
	必修 Required	SCS0531	离散数学（二） Discrete Mathematics（II）	40	2.5			3
	必修 Required	CST2081	汇编语言程序设计 Assembly Language Programming	24	1.5			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
Basic Courses in General Discipline 学科大类基础课程	必修 Required	CST2101	汇编语言程序设计实验 Assembly Language Programming Experiments	16	0.5	16		3
	必修 Required	SSE0561	数据结构 Data Structure	48	3			2
	必修 Required	CST2271	数据结构实验 Data Structure Experiments	16	0.5	16		2
	必修 Required	SCS0101	算法设计与分析 Algorithmic Design and Analysis	48	2.5	16		5
Specialty Required Courses 专业课程专业核心课程	必修 Required	SCS2011	数字电路与逻辑设计 Digital Circuit and Logic Design	32	2			4
	必修 Required	SCS2021	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5	16		4
	必修 Required	SCS2032	计算机组成原理 Computer Organization	40	2.5			4
	必修 Required	SCS2041	计算机组成原理实验 Computer Organization Experiments	16	0.5	16		4
	必修 Required	SCS2081	软件安全 Software security	48	3			5
	必修 Required	CST2221	软件安全实验 Software security Experiments	16	0.5	16		5
	必修 Required	SCS0121	密码学原理 Principle of Cryptography	32	2			4
	必修 Required	CST2011	编译原理 Compiler Principles	32	2			6
	必修 Required	SCS0321	编译原理实验 Compiler Principles Experiments	16	0.5	16		6
	必修 Required	CST2031	操作系统原理 Operating System	40	2.5			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5	16		5
	必修 Required	SCS2101	计算机网络安全 Security of Computer Network	32	2			5
	必修 Required	CST2121	计算机网络安全实验 Security of Computer Network Experiments	16	0.5	16		5
	必修 Required	SCS0221	数据与内容安全 Data and Content Security	32	2			6
	必修 Required	SCS0231	数据与内容安全实验 Data and Content Security Experiments	16	0.5	16		6
Specialty-oriented Courses 专业选修课程			要求选修学分不少于 23 学分					
			A 组选修课（不少于 18 学分）					
	选修 Elective	SCS0271	计算机基础 Foundation of Computer	32	2	16		2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	SCS5071	计算方法 Numerical Analysis	32	2			4
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	CST2281	数据库系统原理 Database System	48	3	16		3
	选修 Elective	CST5201	可信计算 Trusted Computing	32	2	8		6
	选修 Elective	CST5331	网络取证 Network Forensic	32	2	16		6
	选修 Elective	CST5221	逆向工程分析技术 Reverse Engineering Technology	32	2	8		5
	选修 Elective	SCS5051	区块链技术及应用 Blockchain Technology and Application	24	1.5			5
	选修 Elective	SCS5021	认证与访问控制 Access Control	24	1.5			6
	选修 Elective	SCS5031	程序分析与安全 Program Analysis for Security	24	1.5			7
	选修 Elective	SCS0241	机器学习 Machine Learning	24	1.5			7
	选修 Elective	CST5321	网络安全程序设计 Network Security Programming	32	2	8		7
	选修 Elective	SCS3592	网络空间安全综合实践 (V) Comprehensive Practice of Cyberspace Security (V)	2w	1	2w		7
	选修 Elective	SCS0071	移动应用安全 Mobile APP Security	24	1.5			7
	选修 Elective	SCS0181	ACM 算法实践 Practice of ACM Algorithm	32	1	32		2
	选修 Elective	SCS5142	物联网安全与隐私保护 IOT Security and Privacy Protection	32	2	8		6
			B 组选修课					
	选修 Elective	SCS0161	CTF 攻防实践 Comprehensive Practice of CTF	32	1	32		5
	选修 Elective	SCS5092	芯片安全与测试技术导论 Introduction to Chip Security and Test Methods	24	1.5			7
	选修 Elective	SCS5081	硬件描述语言与数字系统设计 Hardware Description Language and Digital System Design	32	2	8		4
	选修 Elective	SCS0171	云计算安全 Cloud Security	24	1.5			6
	选修 Elective	CST5341	无线网络安全 Wireless Network Security	32	2			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	SCS0191	云容器安全（青藤云菁英班） Cloud Container Security	16	1			6
	选修 Elective	SCS5042	游戏设计与安全（腾讯游戏客户端安全菁英班） Game Design and Game Security	16	1			5
	选修 Elective	SCS5111	密码协议基础 Cryptographic Protocol	32	2			5
	选修 Elective	SCS0251	多天线通信理论与技术 Multi Antenna Communication	32	2			7
	选修 Elective	SCS0001	多载波通信技术 Multicarrier Communication	32	2			7
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Practice (VII)	2w	1			3
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			4
	必修 Required	CST3601	生产实习 Engineering Internship	3w	1.5			7
	必修 Required	SCS0261	信息与网络安全课程设计 Course Project of Information and Network Security	2w	1			6
	必修 Required	SCS3511	网络空间安全综合实践（I） Comprehensive practice of Cyberspace Security (I)	2w	1			2
	必修 Required	SCS3522	网络空间安全综合实践（II） Comprehensive practice of Cyberspace Security (II)	2w	1			4
	必修 Required	SCS3532	网络空间安全综合实践（III） Comprehensive practice of Cyberspace Security (III)	2w	1			5
	必修 Required	SCS3542	网络空间安全综合实践（IV） Comprehensive practice of Cyberspace Security (IV)	2w	1			6
	必修 Required	CST3521	操作系统课程设计 Course Project of Operation System	2w	1			6
	必修 Required	CST3511	毕业设计（论文） Undergraduate Thesis	14w	7			8



## 密码科学与技术专业本科培养计划

### Undergraduate Program for Specialty in Cryptographic Science and Technology

#### 一、培养目标

##### I. Educational Objectives

本专业面向国家密码发展战略，坚持立德树人，培养德、智、体、美、劳全面发展，掌握自然科学、人文社会、信息科学和法律法规的基础知识，系统掌握密码科学和工程的基本理论和关键技术，具有较强的法律意识和安全保密观念，具有密码科学与技术领域较强的科学研究能力、工程实践能力与创新意识，具有国际视野和跟踪密码前沿领域发展的洞察力，具有团队合作精神和组织管理能力和终生学习能力的密码科学与技术专业高素质人才。培养的毕业生能在密码科学与技术相关产业、科研部门、高等院校及国家密码安全相关的部门和机构中从事研究、应用、开发和管理等工作。毕业五年左右可成为单位、领域或行业的技术骨干或业界精英。

目标 1：具有良好的思想道德修养、科学文化素质、职业道德和社会责任感，熟悉并遵守网络和密码安全相关政策法规；

目标 2：具有良好的应用、研究和创新能力，能够在跨学科跨领域工程背景下进行密码系统的规划、设计、开发和管理；

目标 3：具有国际化视野和管理决策能力，能够在多学科多文化合作团队中计划、组织、协调和指挥；

目标 4：具备在职业工作和社会环境中自主学习和适应的能力，能够适应行业发展，创新创业意识强。

Facing the national cryptographic science and technology development strategy, with the goal of building morality and cultivating students, students should be high-quality talents majoring in cryptographic science and technology, who have comprehensive self-development in different areas including moral, intelligence, health, art and labor, master the basic knowledge of natural science, humanities and society, information science and laws and regulations, systematically master the basic theories and key technologies of cryptographic science and technology, have strong legal awareness and concept of security and confidentiality, have strong scientific research ability, engineering practice ability and innovation consciousness in the field of cryptographic science and technology, have international vision and insight into the development of frontier areas of cryptographic science and technology, have teamwork spirit, organizational management ability and lifelong learning ability. The graduates trained should engage in research, application, development and management in cryptographic science and technology-related industries, scientific research departments, colleges and universities, and national cryptographic science and technology-related organizations and institutions. After five years of graduation, the students should become technical backbones or industry elites in organizations, fields or industries.

Goal 1: Having good ideological and moral cultivation, scientific and cultural quality, professional ethics and social responsibility, being familiar with and abiding by policies and regulations related to network and cryptographic security;

Goal 2: Having good application, research and innovation capabilities, and being able to plan,

design, develop and manage cryptographic systems in the context of interdisciplinary and interdisciplinary engineering;

Goal 3: Having an international vision and management decision-making ability, and being able to plan, organize, coordinate and command in a multidisciplinary and multicultural cooperative team;

Goal 4: Having the ability to learn and adapt independently in the professional work and social environment, being able to adapt to the development of the industry, and having a strong sense of innovation and entrepreneurship.

## 二、基本规格要求

### II. Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

Graduates should acquire knowledge and competence in the following areas:

1. 工程知识：具备数学、自然科学、工程基础和密码专业知识，并能用于解决密码科学与工程问题。

1. Engineering knowledge: having a solid foundation in mathematics, natural sciences, engineering and cryptographic expertise that can be used to solve cryptographic science and engineering problems.

2. 问题分析：能够应用数学、自然科学、工程科学和计算机科学的基本原理，识别、表达，以及通过文献研究分析密码科学与工程问题，以获得有效结论。

2. Problem analyses: having the ability to apply basic principles of mathematics, natural science, engineering science, and computer science to identify, represent, and analyze cryptographic science and engineering problems through literature research in order to obtain valid conclusions.

3. 设计/开发解决方案：能够设计针对密码科学与工程问题的解决方案，包括满足特定需求的系统、单元（模块）或开发（算法）流程，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Designing/Developing solutions: having the ability to develop/design solutions to scientific and engineering problems in this major, including algorithms, systems, units (modules) or development processes that meet specific needs, and the ability to reflect the sense of innovation in the design process, considering social, health, safety, legal, cultural, and environmental factors.

4. 研究：能够基于科学原理、科学方法和专业知识对密码科学与工程问题进行研究，通过实验设计与仿真、数据分析与解释，并通过信息综合得到合理有效的结论。

4. Research: being able to study cryptographic science and engineering issues based on scientific principles, scientific methods, and professional knowledge, including constructing algorithms, designing experiments, analyzing and interpreting data, and obtaining effective conclusions through information synthesis.

5. 使用现代工具：能够针对密码科学与工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，进行设计、预测、模拟与实现，并能够理解其局限性。

5. Using advanced tools: being able to select appropriate development tools, development models, and testing techniques in actual cryptographic engineering activities, and flexibly use various modern tools to design, simulate and implement cryptographic engineering problems, and being able to understand the limitations of different tools.

6. 工程与社会：能够基于密码工程相关背景进行合理分析，评价密码科学与技术专业工程实践和密码安全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. Engineering and society: being able to conduct a reasonable analysis based on the relevant

background knowledge of this major, evaluate the impact of the scientific and engineering problem solutions of the major on the society, health, safety, law, and culture, and understand the responsibilities that should be undertaken.

7. 环境和可持续发展：在密码科学与工程实施过程中具有可持续发展理念，能够理解和评价针对密码科学与工程问题的工程实践对环境、社会可持续发展的影响。

7. Environment and sustainable development: having a sustainable development concept in the practice of cryptographic science and engineering, being able to understand and evaluate the impact of professional engineering practices aimed at cryptographic science and engineering issues on environmental protection and sustainable social development.

8. 职业规范：具有良好的人文社会科学素养、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. Professional norms: having a good sense of humanities and social sciences, social responsibility, and the ability to understand and comply with engineering professional ethics and norms in engineering practice and fulfill their responsibilities.

9. 个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individuals and team: having the team spirit and team skills to assume the role of individual, team member and leader in a multidisciplinary context.

10. 沟通：能够就密码科学与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。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。

10. Communication: having the ability to communicate and interact effectively with industry peers and the public on cryptographic science and engineering issues, including writing reports and design briefs, presenting statements, and articulating or responding to instructions, having international perspective and the ability to communicate and interact in a cross-cultural context.

11. 项目管理：理解并掌握基本的工程管理原理和经济决策方法，具备一定的工程项目规划与管理能力，能够在多约束条件下进行经济高效的管理决策，并进一步在 multidisciplinary 环境中应用。

11. Project management: being able to understand and master basic engineering management principles and economic decision-making methods, having engineering project planning and management skills, and being able to make economic and efficient management decisions under multiple constraints and to further apply them in a multidisciplinary environment.

12. 终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Lifelong learning: having a sense of self-directed and lifelong learning, with the ability to continuously learn and adapt to development.

### 三、培养模式与特色

#### III. Teaching Model and Characteristics

##### 1. 培养模式

##### 1. Teaching Model

为实现密码科学与技术高端人才培养目标，充分发挥“国家网络安全人才与创新基地”（以下简称“基地”）软硬件设施作用，建立“一院两地、分段实施，多方协同”综合培养模式。学生进校后实施 2+2 的分段培养模式，即本科 2 年在学校本部学习，2 年在基地学习与实践，在基地与学校协同下，完成最终培养目标。

In order to achieve the educational objectives of high-end talents of cryptographic science and

technology, the school of Cyberspace Science and Engineering of Huazhong University of Science and Technology (HUST) gives full play to the roles of the software and hardware facilities of the National Cybersecurity Center For Education and Innovation (NCC), coordinates the educational resources, and builds the integrated education model of “two sites for one school, phased implementation and multipartite coordination”. After entering the school, students will participate in a 2+2 staged training model, that is, two years of undergraduate study in the main campus of HUST and two years of study and practice in NCC. The whole training goal will be achieved with the collaboration between NCC and HUST.

## 2. 培养特色

### 2. Teaching Characteristics

以密码实践工程为目标，以体系化保障密码安全为核心，以计算机、网络以及各类融合系统的体系和结构中的密码安全问题为主线，对这些密码安全问题的根源、现象、脆弱性以及解决方案进行学习、研究和实践。

Aiming at the cryptography practice project, focusing on systematically ensuring cryptography security, taking the cryptography security issues in the systems and structures of computers, networks, and various fusion systems as the main line, and discussing the root causes, phenomena, vulnerabilities, and study the practical solution.

培养具有扎实的密码基础理论和专业技能，全面掌握密码数学基础、密码基础原理、现在密码理论、密码工程实践、密码法规和密码安全管理的专业知识，政治过硬的复合型人才。

Cultivating compound talents who have solid cryptographic basic theories and professional skills, have a comprehensive grasp of cryptographic mathematical foundations, cryptographic basic principles, current cryptographic theory, cryptographic engineering practices, cryptographic regulations and cryptographic security management, and is politically sound.

## 四、主干学科

### IV. Major Disciplines

密码科学与技术

Cryptographical Science and Technology

## 五、学制与学位

### V. Length of Schooling and Degree

修业年限：四年

Length of Schooling: Four Years

授予学位：工学学士

Degree Conferred: Bachelor of Engineering

## 六、学时与学分

### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：148.25

Minimum Required Curricular Credits (including course system and intensive practical training): 148.25

完成学业最低课外学分要求：5

Minimum Required Extracurricular Credits: 5

### 1. 课程体系学时与学分

Hours and Credits in the Course System

华中科技大学 2022 级本科专业培养计划

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
通识教育基础课程	必修	588/30	20.4
	选修	160/10	5.6
学科大类基础课程	必修	872/49.75	30.3
专业课程	专业核心课程	408/23	14.2
	专业方向课程	288/18	10.0
集中性实践教学环节	必修	35w/17.5	19.5
合计		2316+35w/148.25	100.0
其中, 总实验 (实践) 学时及占比		872	29

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Basic Courses in General Education	Required	588/30	20.4
	Elective	160/10	5.6
Basic Courses in General Discipline	Required	872/49.75	30.3
Courses in Specialty	Common Core Courses	408/23	14.2
	Specialty-Oriented Courses	288/18	10.0
Practicum Credits	Required	35w/17.5	19.5
Total		2316+35w/148.25	100.0
Practicum Credits		872	29

2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensive Practical Teaching

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2/1	5.7
工程训练	必修	2/1	5.7
综合实践	必修	10/5	28.6
生产实习 (社会实践)	必修	3/1.5	8.6
课程设计	必修	4/2	11.4
毕业设计 (论文)	必修	14/7	40
合计		35/17.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.7
Comprehensive practice	Required	2/1	5.7
Electrical Engineering Practice	Required	10/5	28.6
Engineering Internship (Social Practice)	Required	3/1.5	8.6
Course Project	Required	4/2	11.4
Undergraduate Thesis	Required	14/7	40
Total		35/17.5	100

3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动及创新创业	思政课社会实践（必修）：提交社会调查报告，通过答辩者		2
		创新创业项目	国家级立项并结题	6
			省级立项并结题	4
			校级立项并结题	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
2	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
2	英语及计算机考试	CSP 考试	200-500 分	2-5
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
3	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
4	论文	在国内外学术期刊或国际学术会议上发表高水平论文	视每篇论文质量	2~6
5	科研	视参与科研项目时间与科研能力	每项	1~3
6	实践成果	创新创业成果、授权专利、专业认证证书、有编号漏洞等	每项成果等级	1~3
7	公益活动	为学校、学院组织的大型活动提供服务, 工程体验	每单元时间	0.5~2
8	劳动教育 (必修)	必须完成学校和学院制定的劳动活动	考核合格	2

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。劳动教育为学生毕业必备条件的必修课程。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice and Innovation & Entrepreneurship	Submit social survey reports and pass oral defense		2
		Projects of Innovation & Entrepreneurship	National Level Project Established and Completed	6
			Provincial Level Project Established and Completed	4
			University Level Project Established and Completed	2
		Win the honor of the Activist of Social Practice by the Communist Youth League of HUST or Hubei Province; Membership of the group which wins the honor of the Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	English and Computer Tests	CET-6 (College English Test Band 6)	Achieving required results of the university	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CSP	200-500 Points or Higher	2-5
		National Computer Software Qualification and Proficiency Test	Certificate of Programmer	2
			Certificate of Advanced Programmer	3
			Certificate of System Analyst	4
3	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2

continue

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
3	Competitions	National Level	First Prize	6
			Second Prize	4
			Third Prize	3
4	Academic papers	High-level academic papers published in national or international journals or international academic conferences	Depending on the quality per paper	2~6
5	Scientific Research	Depending on the time spent in and ability demonstrated in scientific research projects	Per item	1~3
6	Experiment Achievements	Innovation and entrepreneurship achievements, authorized patents, professional certification certificates, numbered vulnerability, etc.	Per item	1~3
7	Volunteer Service	Provide services for large-scale activities organized by university and college	Per unit time	0.5~2
8	Labor Courses	Complete the labor courses set by the school and university	Pass the assessment	2

Note: The first and the second places, the third to fifth places and the sixth to eight places on the sports meetings of HUST are equivalent to the first prize, the second prize and the third prize at the university level, respectively. The labor courses are required courses for students to graduate.

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

离散数学 Discrete Mathematics、汇编语言程序设计 Assembly Language Programming、C 语言程序设计 C Programming、信息安全数学基础 Foundation of information security mathematics、密码学原理 Principle of Cryptography、数据结构 Data Structure、操作系统原理 Operating Systems、计算机组成原理 Computer Organization、计算机通信与网络 Computer Communications & Network、计算机网络安全 Computer Network Security、密码工程基础 Cryptographic Engineering、高级密码学 Advanced Cryptography、密码协议基础 Cryptographic Protocol、密码系统设计 Cryptographic System Design

#### (二) 创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Enlightenment of Innovation Consciousness Courses：信息技术导论 Introduction to Information Technology

创新能力培养类课程 Cultivation of Innovative Ability Courses：网络空间安全综合实践（I） Comprehensive practice of Cyberspace Security（I）、网络空间安全综合实践（II） Comprehensive practice of Cyberspace Security（II）

创新实践训练类课程 Innovative Practice Training Courses：密码软件综合实践 Comprehensive practice of crypto-software、密码硬件综合实践 Comprehensive practice of crypto-hardware、密码系统综合实践 Comprehensive practice of crypto-system

## 八、主要实践教学环节

### VIII. Main Internship and Practical Training

操作系统课程设计 Course Project of Operating Systems、程序设计综合课程设计 Course Project of Programming、网络空间安全综合实践（I） Comprehensive practice of Cyberspace Security（I）、

网络空间安全综合实践 (II) Comprehensive practice of Cyberspace Security (II), 密码软件综合实践 Comprehensive practice of crypto-software、密码硬件综合实践 Comprehensive practice of crypto-hardware、密码系统综合实践 Comprehensive practice of crypto-system

## 九、教学进程计划表

### IX. Table of Teaching Schedule

院 (系): 网络空间安全学院

专业: 密码科学与技术

School (Department): School of Cyber Science & Engineering

Major: Cryptographic Science and Technology

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
通识教育基础课程 basic courses in general education	必修 Required	MAX0022	思想道德与法治 Fundamentals of Ideological and Ethical Standards & Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			2-4
	必修 Required	CHI0001	中国语文 College Chinese	32	2			1
	必修 Required	SFL0001	综合英语 (一) Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 (二) College English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 (二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育 (三) Physical Education ( III )	24	1			5-6
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	选修 Elective		从不同的课程模块中修读若干课程, 美育类课程不低于 2 学分, 心理健康类课程不低于 2 学分, 经济管理类课程不低于 2 学分, 总学分不低于 10 学分 General Education Courses (elective)	160	10			1-4
学科大类基础 Basic Courses in General Discipline	必修 Required	MAT0551	微积分 (一) 上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分 (一) 下 Calculus ( I )	88	5.5			2
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科大类基础 Basic Courses in General Discipline	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments（II）	24	0.75	24		3
	必修 Required	CST5391	信息技术导论 Introduction to Information Technology	24	1.5			1
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistic	40	2.5			3
	必修 Required	SCS0051	C 语言程序设计 Advanced Programming Language（C）	32	2			1
	必修 Required	SCS0061	C 语言程序设计实验 Advanced Programming Language（C）Experiments	48	1.5	48		1
	必修 Required	SCS0212	信息安全数学基础 Foundation of Information Security Mathematics	48	3			4
	必修 Required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			3
	必修 Required	CST0561	计算机通信与网络实验 Computer Telecommunications & Network Experiments	16	0.5	16		3
	必修 Required	SSE0561	数据结构 Data Structure	48	3			2
	必修 Required	CST2271	数据结构实验 Data Structure Experiments	16	0.5	16		2
	必修 Required	CST2081	汇编语言程序设计 Assembly Language Programming	24	1.5			3
	必修 Required	CST2101	汇编语言程序设计实验 Assembly Language Programming Experiments	16	0.5	16		3
	必修 Required	SCS0521	离散数学（一） Discrete Mathematics（I）	40	2.5			2
	必修 Required	SCS0531	离散数学（二） Discrete Mathematics（II）	40	2.5			3
	必修 Required	SCS0101	算法设计与分析 Algorithmic Design and Analysis	48	2.5	16		5
专业课程 专业核心课程 Specialty Required Courses	必修 Required	SCS2011	数字电路与逻辑设计 Digital Circuit and Logic Design	32	2			4
	必修 Required	SCS2021	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5	16		4
	必修 Required	SCS2032	计算机组成原理 Computer Organization	40	2.5			4
	必修 Required	SCS2041	计算机组成原理实验 Computer Organization Experiments	16	0.5	16		4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业核心课程 Specialty Required Courses	必修 Required	SCS2111	密码学概论 Guide for Cryptography	24	1.5			3
	必修 Required	SCS5081	硬件描述语言与数字系统设计 Hardware Description Language and Digital System Design	32	2	8		4
	必修 Required	CST2031	操作系统原理 Operating System	40	2.5			5
	必修 Required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5	16		5
	必修 Required	SCS2101	计算机网络安全 Computer Network Security	32	2			5
	必修 Required	CST2121	计算机网络安全实验 Computer Network Security Experiments	16	0.5	16		5
	必修 Required	CST2011	编译原理 Compiler Principles	32	2			6
	必修 Required	CST0321	编译原理实验 Compiler Principles Experiments	16	0.5	16		6
	必修 Required	SCS0122	密码学原理 Principle of Cryptography	48	3			4
	必修 Required	SCS2131	密码工程基础 Cryptographic Engineering	24	1.5			5
	必修 Required	SCS5121	密码系统设计 Cryptographic System Design	24	1.5			6
专业选修课程 Specialty-oriented Courses			要求选修学分不少于 18 学分					
			A 组选修课（不少于 14 学分）					
	选修 Elective	CST2281	数据库系统原理 Database System	48	3	16		3
	选修 Elective	SCS0271	计算机基础 Foundation of Computer	32	2	16		2
	选修 Elective	SCS0181	ACM 算法实践 Practice of ACM Algorithm	32	1	32		2
	选修 Elective	SCS0281	高级密码学 Advanced Cryptography	32	2			5
	选修 Elective	SCS5111	密码协议基础 Cryptographic Protocol	32	2			5
	选修 Elective	SCS5051	区块链技术的应用 Blockchain Technology and Application	24	1.5			5
	选修 Elective	SCS5142	物联网安全与隐私保护 IoT Security and Privacy Protection	32	2	8		6
	选修 Elective	SCS5061	多媒体数据安全 Multimedia Security	32	2	8		6
	选修 Elective	CST5201	可信计算 Trusted Computing	32	2	8		6

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 Elective	SCS5021	认证与访问控制 Access Control	24	1.5			6
	选修 Elective	CST5321	网络安全程序设计 Network Security Programming	32	2	8		7
			B 组选修课					
	选修 Elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 Elective	SCS5071	计算方法 Numerical Analysis	32	2			4
	选修 Elective	SCS2081	软件安全 Software security	48	3			5
	选修 Elective	CST5331	网络取证 Network Forensic	32	2	16		6
	选修 Elective	CST5221	逆向工程分析技术 Reverse Engineering Technology	32	2	8		5
	选修 Elective	CST5341	无线网络安全 Wireless Network Security	32	2			6
	选修 Elective	SCS5092	芯片安全与测试技术导论 Introduction to Chip Security and Test Methods	24	1.5			7
	选修 Elective	SCS0171	云计算安全 Cloud Security	24	1.5			6
	选修 Elective	SCS0241	机器学习 Machine Learning	24	1.5			7
	选修 Elective	SCS0161	CTF 攻防实践 Comprehensive Practice of CTF	32	1	32		5
	选修 Elective	SCS0071	移动应用安全 Mobile App Security	24	1.5			7
	选修 Elective	SCS0191	云容器安全（青藤云菁英班） Cloud Container Security	16	1			6
	选修 Elective	SCS5042	游戏设计与安全（腾讯游戏客户端安全菁英班） Game Design and Game Security	16	1			5
	选修 Elective	SCS5031	程序分析与安全 Program Analysis for Security	24	1.5			7
	选修 Elective	SCS5161	移动通信原理 Principles of Mobile Communication	32	2			6
	选修 Elective	SCS5171	通信编码安全理论 Security Theory of Communication Coding	32	2			6
	选修 Elective	SCS0251	多天线通信理论与技术 Multi Antenna Communication Theory and Technology	32	2			7
	选修 Elective	SCS0001	多载波通信技术 Multicarrier Communication Technology	32	2			7

续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Internship and Practical Training	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	ENG3551	工程训练（七） Engineering Training (VII)	2w	1			3
	必修 Required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1			4
	必修 Required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1			6
	必修 Required	CST3601	生产实习 Engineering Internship	3w	1.5			7
	必修 Required	SCS0291	密码软件综合实践 Comprehensive Practice of Crypto (Software)	2w	1			5
	必修 Required	SCS0301	密码硬件综合实践 Comprehensive Practice of Crypto (Hardware)	2w	1			5
	必修 Required	SCS0311	密码系统综合实践 Comprehensive Practice of Crypto (System)	2w	1			6
	必修 Required	SCS3511	网络空间安全综合实践（I） Comprehensive Practice of Cyberspace Security ( I )	2w	1			2
	必修 Required	SCS3522	网络空间安全综合实践（II） Comprehensive Practice of Cyberspace Security ( II )	2w	1			4
	必修 Required	CST3511	毕业设计（论文） Undergraduate Thesis	14w	7			8

## 网络空间安全专业本硕博实验班培养计划

### Program of Bachelor-Master-PhD Experimental Class in Cyberspace Security

#### 一、培养目标

##### I. Educational Objectives

本专业面向国家网络空间安全战略，培养德、智、体、美、劳全面发展，掌握自然科学、人文社会、信息科学和法律法规的基础知识，系统掌握网络空间安全的基本理论和关键技术，具有较强的法律意识和安全保密观念，具有网络空间安全领域较强的科学研究能力、工程实践能力与创新意识，具有国际视野和跟踪网络空间安全前沿领域发展的洞察力，具有团队合作精神、组织管理能力和持续竞争力，具备网络空间安全的顶层设计能力，在本学科或专门技术上做出创造性成果的高素质创新人才和领军人才。

Facing the national cyberspace security development strategy, students should be high-quality talents majoring in cyberspace security, who have comprehensive self-development in different areas including moral, intelligence, health, art and labor, master the basic knowledge of natural science, humanities and society, information science and laws and regulations, systematically master the basic theories and key technologies of cyberspace security, have strong legal awareness and concept of security and confidentiality, have strong scientific research ability, engineering practice ability and innovation consciousness in the field of cyberspace security, have international vision and insight into the development of frontier areas of cyberspace security, have teamwork spirit, organizational management ability and sustainable competitive, have the top-level design ability of cyberspace security, high quality innovative talents and leading talents having made creative achievements in this discipline or specialized technology.

#### 二、基本规格要求

##### II. Learning Outcomes

毕业生应获得以下几个方面的知识和能力：

Graduates should acquire knowledge and competence in the following areas:

1. 工程知识：具备数学、自然科学、工程基础和网络空间安全专业知识，并能用于解决网络空间安全领域复杂工程问题。

1. Engineering knowledge: the knowledge of mathematics, natural science, engineering foundation and cyberspace security, as well as the ability to apply this knowledge to solve complex engineering problems in cyberspace security.

2. 问题分析：能够应用数学、自然科学、工程科学和计算机科学的基本原理，识别、表达，以及通过文献研究分析网络空间安全领域复杂工程问题，以获得有效结论。

2. Problem analyses: the ability to apply fundamental principles of mathematics, natural sciences, engineering sciences, and computer science to identify, express, and analyze complex engineering problems in cyberspace security through literature research, and the ability to obtain effective conclusions.

3. 设计/开发解决方案：能够设计针对网络空间安全领域复杂工程问题的解决方案，包括满

足特定需求的系统、单元（模块）或开发（算法）流程，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Designing/Developing solution: the ability to design solutions to complex engineering problems in cyberspace security, including systems, units (modules), or development (algorithmic) processes that meet specific needs, and the ability to reflect innovative awareness and take the social, health, safety, legal, cultural and environmental factors into consideration during the design.

4. 研究：能够基于科学原理、科学方法和专业知识对网络空间安全领域复杂工程问题进行研究，通过实验设计与仿真、数据分析与解释并通过信息综合得到合理有效的结论。

4. Research: being able to study cyberspace security issues based on scientific principles, scientific methods, and professional knowledge, including constructing algorithms, designing experiments, analyzing and interpreting data, and obtaining effective conclusions through information synthesis.

5. 使用现代工具：能够针对网络空间安全领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息工具，进行设计、预测、模拟与实现，并能够理解其局限性。

5. Using advanced tools: being able to select appropriate development tools, development models, and testing techniques in actual cryptographic engineering activities, and flexibly use various modern tools to design, simulate and implement cyberspace security problems, and being able to understand the limitations of different tools.

6. 工程与社会：能够基于网络空间安全工程相关背景进行合理分析，评价网络空间安全专业工程实践和网络空间安全领域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. Engineering and society: being able to conduct a reasonable analysis based on the relevant background knowledge of this major, evaluate the impact of the scientific and engineering problem solutions of the major on the society, health, safety, law, and culture, and understand the responsibilities that should be undertaken.

7. 环境和可持续发展：在网络空间安全领域复杂工程实施过程中具有可持续发展理念，能够理解和评价针对网络空间安全领域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. Environment and sustainable development: having a sustainable development concept in the practice of cyberspace security, being able to understand and evaluate the impact of professional engineering practices aimed at cyberspace security issues on environmental protection and sustainable social development.

8. 职业规范：具有良好的人文社会科学素养、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. Professional norms: having a good sense of humanities and social sciences, social responsibility, and the ability to understand and comply with engineering professional ethics and norms in engineering practice and fulfill their responsibilities.

9. 个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

9. Individuals and team: having the team spirit and team skills to assume the role of individual, team member and leader in a multidisciplinary context.

10. 沟通：能够就网络空间安全领域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。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。

10. Communication: having the ability to communicate and interact effectively with industry peers

and the public on cyberspace security issues, including writing reports and design briefs, presenting statements, and articulating or responding to instructions, having international perspective and the ability to communicate and interact in a cross-cultural context.

11. 项目管理：理解并掌握基本的工程管理原理和经济决策方法，具备一定的工程项目规划与管理能力，能够在多约束条件下进行经济高效的管理决策，并进一步在多学科环境中应用。

11. Project management: being able to understand and master basic engineering management principles and economic decision-making methods, having engineering project planning and management skills, and being able to make economic and efficient management decisions under multiple constraints and to further apply them in a multidisciplinary environment.

12. 终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

12. Lifelong learning: having a sense of self-directed and lifelong learning, with the ability to continuously learn and adapt to development.

### 三、培养模式与特色

#### III. Teaching Model and Characteristics

强化数理和信息学科基础，突出科研和工程训练，推行“两制三化”（即导师制、学分制、个性化、小班化、国际化），实施“一生一方案”，加强科教产教融合，深化国际合作，培养拔尖创新工程领域高层次人才。

Strengthen the foundation of mathematics and information disciplines, highlight scientific research and engineering training, promote “two systems and three modernizations” (namely tutorial system, credit system, personalization, small class and internationalization), implement “one student one plan”, strengthen the integration of science, education, industry and education, deepen international cooperation, and cultivate top-notch innovation and high-level talents in engineering.

本、硕、博贯通培养模式，学制 3+1+x 年，其中本科 3 年，硕士 1 年，博士基础学习年限 4 年。本科三年级、硕士一年级、博士一年级期末进行中期考核，本科考核不合格转入普通本科学习，硕士考核不合格转入本科毕业，博士中期考核不合格根据具体情况处理。

The undergraduate-master-doctor training mode is with a length of schooling for 3+1+x years, including 3 years for bachelor's degree, 1 year for master's degree and 4 years for doctoral basic study. There will be examinations at the end of the third year of the undergraduate courses, end of the first year of the master's degree and end of the first year of the doctor's degree. The students who failed the undergraduate examination will be transferred to the ordinary undergraduate study, the students who failed the master's examination will be transferred to the undergraduate graduation, and the students who failed the intermediate examination of the doctor will be dealt with according to the specific situation.

本科阶段，若连续两学期共超过两门课程不及格或每学年累计加权平均分少于 80 分，转入普通本科，进入普通班或留在原班学习。本硕博班人数不满时，可从普通班选拔补充，根据自愿报名原则，参考已修成绩的加权排名，并经学院教学指导委员会讨论确定。

In the undergraduate stage, if student fail more than two courses in two consecutive semesters or the cumulative weighted average score of each academic year is less than 80 points, the student will be transferred to the ordinary undergraduate course, enter the ordinary class or stay in the original class. When the number of students in this master's and doctoral program is insufficient, they can be selected from ordinary classes. According to the principle of voluntary enrollment, with reference to the weighted ranking of the completed grades, and determined through discussion by the college's Teaching Steering Committee.

网络空间安全专业培养包括学位课程学习和研究实践等培养环节。课程设置突出重理论、重前沿和重学科交叉的特点；在学期间，博士研究生必须参加国际学术会议、教学实践或社会实践，实践类环节可分段进行。

The training of Cyberspace security Major includes the training links of degree course learning and research practice. The curriculum emphasizes the characteristics of emphasizing theory, frontier and interdisciplinary; During the semester, doctoral students must participate in international academic conferences, teaching practice or social practice, and practical links can be carried out in sections.

#### 四、主干学科

#### IV. Major Disciplines

网络空间安全

Cyberspace security

#### 五、学制与学位

#### V. Length of Schooling and Degree

学制：3+1+x 年

Length of Schooling: 3+1+x Years

授予学位：工学博士

Degree Conferred: Doctor of Engineering

#### 六、学时与学分

#### VI. Hours and Credits

(一) 本科阶段 Undergraduate stage

本科完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：150.75 学分。其中，专业核心课程学分不允许用其他课程学分进行学分冲抵和替代。

Minimum Required Curricular Credits (incl. course system and intensive practical training): 150.75. Professional core course credits are not allowed to be offset and replaced by other course credits.

完成学业最低课外学分要求：8

Minimum Required Extracurricular Credits: 8

##### 1. 课程体系学时与学分

Hours/Credits of Course System

课程类别		课程性质	学时/学分	学时比例 (%)
素质教育通识课程		必修	588/30	20.1
		选修	160/10	5.5
学科基础课程		必修	880/50.75	30.1
专业课程	专业核心课程	必修	464/25.5	15.9
	专业选修课程	选修	272/17	9.3
集中性实践教学环节		必修	35w/17.5	19.2
总计			2364+35w/150.75	100
其中，实验（实践）学时及占比			280+35w/25.75	28.7

Course Classified		Course Nature	Hrs/Crs	Hrs Percentage (%)
Basic Courses in General Education		Required	588/30	20.1
		Elective	160/10	5.5
Basic Courses in General Discipline		Required	880/50.75	30.1
Courses in Specialty	Common Core Courses	Required	464/25.5	15.9
	Specialty-Oriented Courses	Elective	272/17	9.3



continue

Course Classified	Course Nature	Hrs/Crs	Hrs Percentage (%)
Internship and Practical Training	Required	35w /17.5	19.2
Total		2364+35w/150.75	100
Practicum Credits		280+35w/25.75	28.7

## 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensive Practical Teaching

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练 (2 周)	必修	2W/1	5.7
工程训练	必修	2W/1	5.7
综合实践	必修	8W/4	22.9
生产实习 (社会实践)	必修	3W/1.5	8.6
课程设计	必修	6W/3	17.1
毕业设计 (论文)	必修	14W/7	40
合计		35W/17.5	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.7
Electrical Engineering Practice	Required	2/1	5.7
Comprehensive practice	Required	8/4	22.9
Engineering Internship (Social Practice)	Required	3/1.5	8.6
Course Project	Required	6/3	17.1
Undergraduate Thesis	Required	14/7	40
Total		35/17.5	100

## 3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动及创新创业	思政课社会实践（必修）：提交社会调查报告，通过答辩者（必修）		2
		创新创业项目	国家级立项并结题	6
			省级立项并结题	4
			校级立项并结题	2
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者		2
2	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		CSP 考试	200-500 分	2-5
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
3	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
4	论文	在国内外学术期刊或国际学术会议上发表高水平论文	视每篇论文质量	2-6
5	科研	视参与科研项目时间与科研能力	每项	1-3

续表

序号	课外活动名称	课外活动和社会实践的要求		课外学分
6	实践成果	创新创业成果、授权专利、专业认证证书、有编号漏洞等	每项成果等级	1-3
7	公益活动	为学校、学院组织的大型活动提供服务, 工程体验	每单元时间	0.5-2
8	劳动教育 (必修)	完成学校和学院制定的劳动教育活动	考核合格	2

注: 参加校体育运动会获第一名、第二名者与校级一等奖等同, 获第三名至第五名者与校级二等奖等同, 获第六至第八名者与校级三等奖等同。思政课社会实践和劳动教育为学生毕业必备条件的必修课外课程。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice and Innovation & Entrepreneurship	Social practice of Ideological and Political Courses, submit social survey reports and pass oral defense		2
		Projects of Innovation & Entrepreneurship	National Level Project Established and Completed	6
			Provincial Level Project Established and Completed	4
			University Level Project Established and Completed	2
		Win the honor of the Activist of Social Practice by the Communist Youth League of HUST or Hubei Province; Membership of the group which wins the honor of the Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	English and Computer Tests	CET-6 (College English Test Band 6)	Achieving required results of the university	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CSP	200-500 Points or Higher	2-5
		National Computer Software Qualification and Proficiency Test	Certificate of Programmer	2
			Certificate of Advanced Programmer	3
			Certificate of System Analyst	4
3	Competitions	University Level	First Prize	3
			Second Prize	2
			Third Prize	1
		Provincial Level	First Prize	4
			Second Prize	3
			Third Prize	2
		National Level	First Prize	6
			Second Prize	4
			Third Prize	3
4	Academic papers	High-level academic papers published in national or international journals or international academic conferences	Depending on the quality per paper	2-6
5	Scientific Research	Depending on the time spent in and ability demonstrated in scientific research projects	Per item	1-3
6	Experiment Achievements	Innovation and entrepreneurship achievements, authorized patents, professional certification certificates, numbered vulnerability, etc.	Per item	1-3
7	Volunteer Service	Provide services for large-scale activities organized by university and college	Per unit time	0.5-2
8	Labor Courses (Required)	Complete the labor courses set by the school and university	Pass the assessment	2

Note: The first and the second places, the third to fifth places and the sixth to eight places on the sports meetings

of HUST are equivalent to the first prize, the second prize and the third prize at the university level, respectively. The labor courses are required courses for students to graduate.

## (二) 研究生阶段 Graduate stage

研究生阶段的总学分要求 $\geq 53$  学分。其中学位课程学分 $\geq 34$ 、研究实践环节要求 19 学分。

The total credits of graduate students are required to be  $\geq 53$  credits. Among them, the degree course credits  $\geq 34$ , and the research and practice links require 19 credits.

## 七、主要课程和创新创业课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### (一) 主要课程 Main Courses

离散数学 Discrete Mathematics、汇编语言程序设计 Assembly Language Programming、C 语言程序设计 C Programming、数据结构 Data Structure、操作系统原理 Operating Systems、密码学原理 Principle of Cryptography、系统安全 System Security、计算机通信与网络 Computer Communications & Network、计算机网络安全 Computer Network Security、信号与线性系统 Signal and Liner System、通信原理与通信安全 Principles & Security of Communication

#### (二) 创新(创业)课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程 Enlightenment of Innovation Consciousness, Course : 信息技术导论 Introduction to Information Technology

创新能力培养类课程 Cultivation of Innovative Ability, Course :

网络空间安全综合实践 (I) Comprehensive practice of Cyberspace security (I)、

网络空间安全综合实践 (II) Comprehensive practice of Cyberspace security (II)、

网络空间安全综合实践 (III) Comprehensive practice of Cyberspace security (III)

创新实践训练类课程 Innovative Practice Training, Course :

网络空间安全综合实践 (IV) Comprehensive practice of Cyberspace security (IV)、网络空间安全综合实践 (V) Comprehensive practice of Cyberspace security (V)、网络空间安全综合实践 (VI) Comprehensive practice of Cyberspace security (VI)

## 八、主要实践教学环节(含专业实验)

### VIII. Main Internship and Practical Training

网络与系统安全课程设计 Course Project of Network and System Security、操作系统课程设计 Course Project of Operating Systems、程序设计综合课程设计 Course Project of Programming、网络空间安全综合实践(I) Comprehensive practice of Cyberspace security (I)、网络空间安全综合实践 (II) Comprehensive practice of Cyberspace security (II)、网络空间安全综合实践(III) Comprehensive practice of Cyberspace security (III)、网络空间安全综合实践(IV) Comprehensive practice of Cyberspace security (IV)、网络空间安全综合实践(V) Comprehensive practice of Cyberspace security (V)、网络空间安全综合实践(VI) Comprehensive practice of Cyberspace security (VI)、生产实习 Engineering Internship、毕业设计(论文) Undergraduate Thesis。

## 九、教学进程计划表

### IX. Table of Teaching Schedule

院(系): 网络空间安全学院

Department: School of Cyber Science and Engineering

专业: 网络空间安全

Major: Cyberspace Security

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课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Fundamentals of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			1-3
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	SFL0001	综合英语（一） Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语（二） Comprehensive English ( II )	56	3.5			2
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	选修 Elective		从不同的课程模块中修读若干课程，总学分不低于 10 学分（美育类课程不少于 2 学分、《大学生心理健康》必修、经济管理类课程不少于 2 学分）	160	10			1-4
学科(大类)基础课程 Basic Courses in General Discipline	必修 required	CST5391	信息技术导论 Introduction to Information Technology	24	1.5			1
	必修 required	MAT0722	线性代数 (A) Linear Algebra	48	3			1
	必修 required	MAT0552	微积分 (A) 上 Calculus (A)	96	6			1
	必修 required	MAT0532	微积分 (A) 下 Calculus (A)	96	6			2
	必修 required	PHY0511	大学物理（一） Physics ( I )	64	4			2
	必修 required	PHY0521	大学物理（二） Physics ( II )	64	4			3
	必修 required	PHY0551	物理实验（一） Physical Experiments ( I )	32	1	32		2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科(大类)基础课程 Basic Courses in General Discipline	必修 required	PHY0561	物理实验(二) Physical Experiments (II)	24	0.75	24		3
	必修 required	MAT0592	概率论与数理统计(A) Probability and Mathematics Statistic	48	3			3
	必修 required	SCS0051	C 语言程序设计 Advanced Programming Language (C)	32	2			1
	必修 required	SCS0061	C 语言程序设计实验 Advanced Programming Language(C) Experiments	48	1.5	48		1
	必修 Required	SCS0521	离散数学(一) Discrete Mathematics	40	2.5			2
	必修 Required	SCS0531	离散数学(二) Discrete Mathematics	40	2.5			3
	必修 Required	SSE0561	数据结构 Data Structure	48	3			2
	必修 Required	CST2271	数据结构实验 Data Structure Experiments	16	0.5	16		2
	必修 required	CST0541	计算机通信与网络 Computer Telecommunications & Network	40	2.5			3
	必修 Required	CST0561	计算机通信与网络实验 Computer Telecommunications & Network Experiments	16	0.5	16		3
	必修 Required	CST2081	汇编语言程序设计 Assembly Language Programming	24	1.5			3
	必修 Required	CST2101	汇编语言程序设计实验 Assembly Language Programming Experiments	16	0.5	16		3
	必修 required	SCS0091	网络空间安全数学基础 Foundation of Cyberspace security Mathematics	32	2			4
	必修 Required	SCS0101	算法设计与分析 Algorithmic Design and Analysis	48	2.5	16		5
学科专业基础课程	必修 required	SCS0121	密码学原理 Principle of Cryptography	32	2			4
	必修 required	SCS2011	数字电路与逻辑设计 Digital Circuit and Logic Design	32	2			4
	必修 required	SCS2021	数字电路与逻辑设计实验 Digital Circuit and Logic Design Experiments	16	0.5	16		4
	必修 required	SCS2032	计算机组成原理 Computer Organization	40	2.5			4
	必修 required	SCS2041	计算机组成原理实验 Computer Organization Experiments	16	0.5	16		4
	必修 required	CST2031	操作系统原理 Operating System	40	2.5			5
	必修 required	CST2041	操作系统原理实验 Operating System Experiments	16	0.5	16		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
	必修 required	CST2011	编译原理 Compiler Principles	32	2			6
	必修 required	SCS0321	编译原理实验 Compiler Principles Experiments	16	0.5	16		6
专业核心课程 Specialty Required Courses	必修 required	SCS0111	信号与线性系统 Signal and linear System	48	3			4
	必修 required	SCS0131	系统安全 System Security	48	3			5
	必修 required	SCS0141	系统安全实验 System security Experiments	16	0.5	16		5
	必修 required	SCS2101	计算机网络安全 Computer Network Security	32	2			5
	必修 required	CST2121	计算机网络安全实验 Computer Network Security Experiments	16	0.5	16		5
	必修 required	SCS2151	通信原理与通信安全 Principles & Security of Communication	48	3			6
	必修 required	SCS0151	通信原理与通信安全实验 Communication Principles and Communication Security Experiments	16	0.5	16		6
专业选修课程 Specialty-oriented Courses	要求选修学分不少于 17 学分							
	选修 elective	SCS0271	计算机基础 Computational Thinking	32	2	16		2
	选修 elective	SCS0181	ACM 算法实践 Practice of ACM Algorithm	32	1	32		2
	选修 elective	CST5481	人工智能导论 Artificial Intelligence	24	1.5			3
	选修 elective	CST2281	数据库系统原理 Database System	48	3	16		3
	选修 elective	SCS5081	硬件描述语言与数字系统设计 Hardware Description Language and Digital System Design	32	2	8		4
	选修 elective	SCS5071	计算方法 Numerical Analysis	32	2			4
	选修 elective	CST5221	逆向工程分析技术 Reverse Engineering Technology	32	2	8		5
	选修 elective	SCS5042	游戏设计与安全 Game Design and Game Security	16	1			5
	选修 elective	SCS5051	区块链技术及应用 Blockchain Technology and Application	24	1.5			5
	选修 elective	SCS0161	CTF 攻防实践 Comprehensive Practice of CTF	32	1	32		5
	选修 elective	CST5331	网络取证 Network Forensic	32	2	16		6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Specialty-oriented Courses	选修 elective	CST5341	无线网络安全 Wireless Network Security	32	2			6
	选修 elective	SCS5021	认证与访问控制 Access Control	24	1.5			6
	选修 elective	SCS5142	物联网安全与隐私保护 IOT Security and Privacy Protection	32	2	8		6
	选修 elective	SCS0171	云计算安全 Cloud Security	24	1.5			6
	选修 elective	SCS5161	移动通信原理 Principles of Mobile Communication	32	2			6
	选修 elective	SCS5171	通信编码安全理论 Security theory of Communication Coding	32	2			6
	选修 elective	CST5201	可信计算 Trusted Computing	32	2	8		6
	选修 elective	SCS5061	多媒体数据安全 Multimedia Security	32	2	8		6
	选修 elective	SCS0191	云容器安全（青藤云菁英班） Cloud Container Security	16	1			6
	选修 elective	SCS3592	网络空间安全综合实践（V） Comprehensive practice of Cyberspace Security（V）	2w	1	2w		7
	选修 Elective	SCS5091	芯片安全与测试技术导论 Introduction to Chip Security and Test Methods	24	1.5			7
	选修 Elective	SCS5181	多天线通信理论与技术 Multi Antenna Communication Theory and Technology	32	2			7
	选修 Elective	SCS5191	多载波通信技术 Multicarrier Communication Technology	32	2			7
	选修 Elective	CST5321	网络安全程序设计 Network Security Programming	32	2	8		7
	选修 Elective	SCS0071	移动应用安全 Mobile App Security	24	1.5			7
	选修 Elective	SCS5031	程序分析与安全 Program Analysis for Security	24	1.5			7
	选修 Elective	SCS0241	机器学习 Machine Learning	24	1.5			7
实习环节 Internship and Practical Training	必修 required	CST3521	操作系统课程设计 Course Project of Operating System	2w	1	2w		6
	必修 required	SCS3511	网络空间安全综合实践（I） Comprehensive Practice of Cyberspace Security（I）	2w	1	2w		2
	必修 required	SCS3522	网络空间安全综合实践（II） Comprehensive Practice of Cyberspace Security（II）	2w	1	2w		4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
实践环节 Internship and Practical Training	必修 required	SCS3532	网络空间安全综合实践 (III) Comprehensive Practice of Cyberspace Security (III)	2w	1	2w		5
	必修 required	SCS3542	网络空间安全综合实践 (IV) Comprehensive Practice of Cyberspace Security (IV)	2w	1	2w		6
	必修 required	RMWZ3511	军事训练 Military Training	2w	1	2w		1
	必修 required	ENG3551	工程训练 (七) Electrical Engineering Practice (VII)	2w	1	2w		3
	必修 required	CST3531	程序设计综合课程设计 Course Project of Programming	2w	1	2w		4
	必修 required	CST3601	生产实习 Engineering Internship	3w	1.5	3w		5
	必修 required	SCS0201	网络与系统安全课程设计 Course Project of Network & System Security	2w	1	2w		6
	必修 required	CST3511	毕业设计 (论文) (硕士阶段创新实践环节) Undergraduate Thesis	14w	7	14w		8

附件：研究生阶段（硕士及博士阶段）Postgraduate stage (Master and PHD stage)

## 1. 课程和学分要求

Course and credit requirements

总学分	≥53 学分	
学位课程	≥34 学分	校级公共必修课程≥9 学分，其中： 《新时代中国特色社会主义理论与实践》（2 学分）； 《自然辩证法概论》（1 学分）； 硕士第一外国语（2 学分） 《中国马克思主义与当代》（2 学分）； 《英语论文写作》（2 学分）。
		校级公共选修课≥1 学分：人文类或理工类或其它类课 1 学分。
		学科基础与专业课程≥24 学分，其中： 一级学科基础课程 8 学分（含《论文写作》1 学分） 二级学科基础课程 4 学分 硕士专业课程 4 学分 博士专业课程 4 学分 跨一级学科课程 4 学分
研究实践环节	≥19 学分	开题报告（1 学分）
		论文中期进展报告（1 学分）
		参加国内外学术会议并提交论文（1 学分）
		发表学术论文（1 学分）
		博士学位论文（15 学分）
其它	不计学分	补修课程、任选课程只计成绩，不计学分



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Total	≥53 credits	
Degree courses	≥34 credits	Public required courses in university ≥9 credits, including : 《Theory and Practice of Socialism with Chinese Characteristics in a New Era》(2 credits) ; 《Natural Dialectics》(1 credit) ; The First Foreign Language for Master(English) (2 credits); 《Chinese Marxism and Contemporary China》(2credits);《English Paper Writing》(2 credits) 。
		Public elective courses in university ≥1 credits : Humanities, science and engineering or other courses (1 credit)。
		Discipline-related basic courses and professional courses ≥ 24 credits, including : General courses of level I discipline (8 credits, including 1 credit for Thesis Writing) General courses of level II discipline (4 credits) Master's professional courses (4 credits) Doctor's professional course (4 credits) Level I interdisciplinary courses (4 credits)
		Thesis Opening Report (1credit)
Research and Practice	≥19 credits	Medium Progress Report for Thesis (1 credit)
		Participate in domestic and international academic conferences and submit papers (1credit)
		Publish academic papers (1 学分)
		Doctoral Dissertation (15 学分)
Others	No credits	Make up courses and elective courses are only counted as grades, no credits

2. 课程设置及学分分配

Curriculum and credit distribution

课程 course	类别 type	课程代码 course code	课程名称 course name	学时 hours	学分 credits	季节 season	开课单位 school for course	研习要求 study requirements
学位课程 Degree Courses	公共必修课程 Public Required courses	408210001	中国马克思主义与当代 Chinese Marxism and Contemporary China	36	2	秋 Autumn	马克思主义学院 School of Marxism	≥9 学分 credits
		411210001	英语论文写作 English Paper Writing	32	2	秋 Spring	外国语学院 School of Foreign Languages	
		408130001	新时代中国特色社会主义理论与实践 Theory and Practice of Socialism with Chinese Characteristics in a New Era	36	2	秋 Autumn	马克思主义学院 School of Marxism	
		408110001	自然辩证法概论 Natural Dialectics	18	1	秋 Autumn	马克思主义学院 School of Marxism	
		411130003	第一外国语(英语) The First Foreign Language for Master(English)	32	2	秋 Autumn	外国语学院 School of Foreign Languages	
	校级公选课程 Public elective courses in university	110130001	纳米技术与应用 Nanotechnology and Application	32	2	秋 Autumn	材料学院(基地) School of Materials Sci. and Eng. (in NCC)	≥1 学分 : 人文类或理工类或其它类课 1 学分 Humanities, science and engineering or other courses 1 credit
		121130001	新能源技术 New Energy Technology	32	2	秋 Autumn	能源学院 School of Energy	
		300130001	现代管理理论与方法 Modern Management Theory and Method	32	2	春 Spring	管理学院 School of Management	
		300130002	知识产权 Intellectual Property	16	1	春 Spring	管理学院 School of Management	
		400130001	中国传统文化评析 Comment on Chinese Traditional Culture	16	1	春 Spring	人文学院 School of Humanities	
		503130001	情报检索 Information Retrieval	24	1.5	春秋 Spring Autumn	图书馆 Library	
	通识课 General Courses	920131002	学术规范与论文写作 Academic Norms and Thesis Writing	16	1	春 Spring	网安学院 School of Cyber Sci. and Eng. (i.e.CSE)	≥1 学分 credit
		920132001	网安中国 Network Security China	16	1	春 Spring	网安学院 CSE	

续表

课程 course	类别 type	课程代码 course code	课程名称 course name	学时 hours	学分 credits	季节 season	开课单位 school for course	研习要求 study requirements
学位课程 Degree Courses	一级学科基础课 Basic courses of first level discipline	011110001	矩阵论 Matrix theory	48	3	秋 Autumn	数学与统计学院 School of Mathematics and Statistics	必修 ≥7 学分 (矩阵论、代数学二选一) Required ≥7 credits (Select 1 from Matrix Theory and Algebra)
		920131001	代数学 Algebra (CSE)	48	3	秋 Autumn	网安学院 CSE	
		920131016	现代密码学 Modern Cryptography	48	3	秋 Autumn	网安学院 CSE	
		920131020	复杂网络基础与应用 Foundation and Application of Complex Network	32	2	秋 Autumn	网安学院 CSE	
		920131026	计算系统安全 Computing System Security	32	2	秋 Autumn	网安学院 CSE	
		920131024	网络安全 (2022) Network Security(2022)	32	2	秋 Autumn	网安学院 CSE	
	二级学科基础课 Basic courses of second level discipline	920131003	区块链技术与应用 (网安) Blockchain Technology and Application(CSE)	32	2	秋 Autumn	网安学院 CSE	≥4 学分 credits
		920131017	高级网络安全技术 Advanced Network Security Technology	32	2	秋 Autumn	网安学院 CSE	
		920131018	隐私保护 Privacy Protection	48	3	秋 Autumn	网安学院 CSE	
		920131019	密码算法分析 Cryptographic Algorithm Analysis	32	2	秋 Autumn	网安学院 CSE	
		920131023	社交网络分析 Social Network Analysis	32	2	秋 Autumn	网安学院 CSE	
		920131025	软件安全 Software Security	32	2	秋 Autumn	网安学院 CSE	
		920131027	应用系统安全 Application System Security	32	2	秋 Autumn	网安学院 CSE	
	硕士专业选修课程 Elective courses for master	920131006	软件无线电(网安) Software Defined Radio(CSE)	32	2	春 Spring	网安学院 CSE	≥4 学分 credits
		920131008	智能媒体计算 (网安) Smart Media Computing(CSE)	32	2	秋 Autumn	网安学院 CSE	
		920131010	计算机病毒传播模型 Computer Virus Propagation Model	32	2	秋 Autumn	网安学院 CSE	
		920131012	量子计算与量子密码 Quantum Computing and Quantum Cryptography	32	2	秋 Autumn	网安学院 CSE	
		920131013	软件逆向分析技术及应用 Software Reverse Analysis Technology and Application	32	2	秋 Autumn	网安学院 CSE	
		920131014	现代数字通信 (网安) Modern Digital Communication (CSE)	48	3	秋 Autumn	网安学院 CSE	
		920131015	硬件安全与人工智能 (留学生) Hardware Security and Artificial Intelligence (oversea students)	32	2	秋 Autumn	网安学院 CSE	
		920131021	信息隐藏 (网安) Information Hiding (CSE)	32	2	秋 Autumn	网安学院 CSE	
		920131022	区块链金融安全 Blockchain Financial Security	32	2	秋 Autumn	网安学院 CSE	
		920131028	计算的基本理论 (2022) Computing Basic Theory (2022)	48	3	秋 Autumn	网安学院 CSE	
		920131029	创新与思辨 (方班研讨厅) Innovation and Speculation (Fangban Seminar Hall)	32	2	春 Spring	网安学院 CSE	

续表

类别 type		课程代码 course code	课程名称 course name	学时 hours	学分 credits	季节 season	开课单位 school for course	研习要求 study requirements	
课程 course									
学位课程 Degree Courses	Elective courses for doctor	920231001	大数据存储安全 Big Data Storage Security	32	2	秋 Autumn	网安学院 CSE	≥4 学分 credits	
		920231002	密码安全专题 Cryptography Security Topic	32	2	秋 Autumn	网安学院 CSE		
		920231005	网络安全专题 Network Security Topic	32	2	秋 Autumn	网安学院 CSE		
		920231006	新技术安全 New Technology Security	32	2	秋 Autumn	网安学院 CSE		
	disciplinary courses	跨一级学科课程 level 1 interdisciplinary courses	920131004	通信专题讲座（网安） Communication Topic (CSE)	32	2	秋 Autumn	网安学院 CSE	≥4 学分 credits
			920131005	信道编码（网安） Channel Coding (CSE)	32	2	春 Spring	网安学院 CSE	
研究环节 research		650219001	博士学位论文（学术型） Doctoral Dissertation (Academic)			15	研究生院 Graduate School	≥19 学分 credits	
		650239001	开题报告（博） Thesis Opening Report (Doctor)			1			
		650239002	论文中期进展报告（博） Medium Progress Report for Thesis (Doctor)			1			
		650239003	参加国内外学术会议并提交论文（博） Participate in Domestic and International Academic Conferences and Submit Papers (Doctor)			1			
		650239004	发表学术论文（博） Publish Academic Papers (Doctor)			1			

## 软 件 学 院

华中科技大学软件学院是经教育部批准（教高[2001]6 号文）的首批 35 所国家示范性软件学院之一。

学院坚持以立德树人为根本任务，紧密结合国家战略需求和关键核心软件领域，以特色化软件人才培养为导向，面向产业、面向领域；坚持国际合作、校企共建；坚持质量第一，素质与技术并重、基础与实践统一；坚持办学模式、管理体制、课程体系、教学内容和教学方法的改革和创新；秉承“厚基础、强能力、重实践、求创新”的工程教育理念；力争做到人才培养与社会需求无缝接轨，使学院成为培养高层次、复合型、国际化、工程型软件拔尖人才的基地。

学院具有“软件工程”与“数字媒体技术”两个国家级特色专业建设点和“软件工程领域”全国工程硕士研究生教育特色工程领域，是全国为数不多同时获得本科教育“国家级特色专业建设点”和研究生教育“特色工程领域”的国家示范性软件学院。其中，软件工程专业是国家级一流专业建设点。

## 软件工程专业本科培养计划

### Undergraduate Program in Software Engineering

#### 一、培养目标

##### I . Program Objectives

软件工程专业培养具有良好的道德操守、规范的职业素养，具备扎实的工程基础与专业知识、在拥有宽广的专业基础上掌握基础软件与大型工业软件等领域的专门知识、能够熟练掌握一门外语，能够熟练应用软件工程的分析、设计、开发与管理工具，解决复杂的工程问题，具备社会责任感、创新能力、组织能力、国际视野与团队合作精神的软件工程技术和人才。毕业生能够从事软件工程等相关领域的科研、开发及管理等工作，成为德智体美劳全面发展的社会主义建设者和接班人。

The objectives of the training of the students in software engineering are to cultivate the technical and management talents with good moral integrity, high professional standards and quality, solid engineering foundation and professional knowledge, specialized knowledge in key infrastructural software and large-scale industrial software on the basis of broad view in engineering fields, proficient in a foreign language, and skilled application of software engineering analysis, design, development and management tools to solve complex problems, and with a sense of social responsibility, innovation ability, organizational ability, international vision and team spirit. Graduates are expected to work in the areas of research, development and management of software engineering and other related fields, and become the socialist builders and successors of all-round development of morality, intelligence, physique, beauty and labor.

#### 二、基本要求

##### II . Learning Outcomes

毕业生应获得以下几方面的知识和能力：

1.工程知识：具备数学、自然科学、工程基础和软件工程专业知识，并能用于解决复杂软件工程问题

1.1 能将数学、自然科学和信息科学的语言工具用于复杂软件工程问题的表述。

1.2 能针对复杂软件工程问题的具体对象进行建模和求解。

1.3 能将软硬件知识、相关工程知识和模型方法用于推演、分析复杂软件工程问题。

1.4 能将软硬件知识、相关工程知识和模型方法用于复杂软件工程问题解决方案的比较和综合。

2.问题分析：能够应用数学、自然科学、工程科学、计算机科学以及软件工程的基本原理，识别、表达、并通过文献研究分析复杂软件工程问题，以获得有效结论

2.1 能综合运用数学、自然科学、工程科学、计算机科学以及软件工程的基本原理，识别、判断和表达复杂软件工程问题的关键环节。

2.2 对复杂软件工程问题的一个系统或者过程，能选择或建立一种模型，对关键影响因素进行分析。

2.3 对复杂软件工程的多种可选方案，能根据约束条件并结合文献进行分析和研究，并得出有效结论。

3.设计/开发解决方案：能设计针对复杂软件工程问题的解决方案，能设计满足特定需求的模

块、算法流程或系统，并能在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素

3.1 掌握与复杂软件工程问题有关的工程设计和软硬件产品开发全周期、全流程的基本设计/开发方法和技术，了解影响设计目标和技术方案的多种因素。

3.2 能为复杂软件工程问题解决方案设计满足特定需求的软件模块。

3.3 能为复杂软件工程问题解决方案进行软件系统和应用系统设计，并能在设计中体现创新意识。

3.4 能在复杂软件工程问题解决方案设计中考虑社会、健康、安全、法律、文化及环境等制约因素。

4.研究：能基于软件工程原理并采用科学方法对复杂软件工程问题进行研究，通过设计实验、建模仿真、分析与解释数据，并通过信息综合得到合理有效结论

4.1 能基于计算机科学和软件工程理论，采用文献研究、调研、案例分析、建模仿真等科学方法，分析复杂软件工程问题的关键环节。

4.2 能根据复杂软件工程问题解决方案的特定对象特征，选择研究路线，设计实验方案、构建实验系统，并进行实验和正确采集实验数据。

4.3 能对实验结果进行理论分析，对实验现象进行解释，并能通过信息综合得到合理有效的结论。

5.使用现代工具：能针对复杂软件工程问题设计、预测、模拟与实现的需要，开发、选择与使用恰当的技术、软硬件及系统资源、现代化开发工具，并能够理解所使用工具和资源的局限性

5.1 了解软件工程专业常用的现代仪器、信息技术工具、工程工具和模拟软件的使用原理和方法，并理解其局限性。

5.2 能够根据解决软件工程领域复杂工程问题的实际需要，选择和使用恰当的仪器、开发或选用满足特定需求的现代化工具，对具体对象进行模拟、预测、分析或设计，并能分析优势与局限性。

6.工程与社会：能基于软件工程领域工程相关背景知识进行合理分析，评价计算机软硬件开发、系统设计等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

6.1 了解计算机软件相关的技术标准、知识产权保护、法律法规及产业政策，理解不同社会文化对计算机软件相关工程活动的影响。

6.2 能分析和评价具体的软件工程实践和复杂工程问题解决方案与社会、健康、安全、法律以及文化的之间相互影响，理解工程师应承担的责任。

7.环境和可持续发展：能理解和评价针对复杂软件工程问题的专业工程实践对环境、社会可持续发展的影响

7.1 贯彻科学发展观，能理解环境保护和社会可持续发展的理念和内涵，了解信息化与环境保护的关系，熟悉软件产业相关环境保护和可持续发展的方针、政策和法律法规。

7.2 能分析和评价复杂软件工程问题的解决方案和专业实践与客观世界和社会可持续发展间的相互影响。

8.职业规范：具有人文社会科学素养和社会责任感，能在软件工程实践中理解并遵守工程职业道德和规范，履行工程师的责任

8.1 具有正确价值观，理解个人和社会的关系，了解中国国情和我国信息产业发展现状。

8.2 理解诚实公正、诚信守则的工程职业道德和规范，并能在工程实践中自觉遵守。

8.3 能理解工程师对公众的安全、健康以及环境保护的社会责任，并能在工程实践中自觉履行责任。

9.个人和团队：具有团队意识和团队能力，能够在多学科背景下的团队中协同工作，并承担

个体、团队成员以及负责人的角色

9.1 具有团队意识，能理解团队中角色的划分及其重要性，能与其他学科的成员有效沟通，合作共事。

9.2 能够在多学科背景下的团队中独立或合作开展工作，承担负责人的角色，组织、协调和指挥团队开展工作。

10.沟通：能够就复杂软件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

10.1 能就专业问题，以口头、文稿、图表等方式，准确表达自己的观点，回应质疑，理解与同行和社会公众等不同对象及不同方式交流的差异性。

10.2 了解软件工程领域的国际发展趋势、研究热点，理解和尊重世界不同文化的差异性和多样性。

10.3 具有跨文化交流的语言和书面表达能力，能就软件工程专业问题在跨文化背景下进行基本的沟通与交流。

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

11.1 理解工程管理与经济决策的重要性，掌握工程项目中涉及的管理原理与经济决策方法。

11.2 了解信息系统工程及产品全周期、全流程的成本构成，能在多学科环境下，将管理原理、经济方法应用于设计开发软件工程领域复杂工程问题解决方案的过程中。

12.终身学习：具有自主学习和终身学习的意识，具有通过不断学习掌握新技术、适应信息技术新发展的能力

12.1 能认识到软件技术日新月异的发展特点，认同自主学习和终身学习的必要性。

12.2 具备自主学习能力，能通过多种途径拓展自己的知识和能力，包括理解能力、归纳总结能力和提出问题的能力等。

Graduates should acquire the following knowledge and abilities:

1. Engineering knowledge: Possess professional knowledge of mathematics, natural science, engineering foundation and software engineering, and apply it to solve complex software engineering problems

1.1 Having the ability to use the language and tools of mathematics, natural science and information science for the presentation of complex software engineering problems.

1.2 Being able to model and solve specific objects of complex software engineering problems.

1.3 Being able to use hardware and software knowledge, related engineering knowledge and modeling methods to deduce and analyze complex software engineering problems.

1.4 Being able to compare and synthesize solutions to complex software engineering problems using hardware and software knowledge, related engineering knowledge and modeling methods.

2. Problem analysis: Apply the basic principles of mathematics, natural science, engineering science, computer science and software engineering to identify, express, and analyze complex software engineering problems through literature research to reach the effective conclusions

2.1 Being able to comprehensively use the basic principles of mathematics, natural science, engineering science, computer science and software engineering to identify, judge and express the key links of complex software engineering problems.

2.2 Select or establish a model to analyze the key influencing factors for a system or process of complex software engineering problems.

2.3 Being able to analyze and study multiple alternative schemes of complex software engineering according to constraint conditions and combined with literature, and draw effective conclusions.

3. Design/develop solutions: Design solutions to complex software engineering problems, design modules, algorithmic processes or systems to meet specific needs, and demonstrate the sense of innovation in the design process, considering social, health, safety, legal, cultural and environmental factors

3.1 Master the basic design/development methods and technologies of engineering design and software and hardware product development in the whole cycle and process related to complex software engineering problems, and understand the various factors affecting design objectives and technical solutions.

3.2 Design software modules to meet specific requirements for solutions to complex software engineering problems.

3.3 Being able to design software system and application system for solving complex software engineering problems, and be able to reflect innovation consciousness in the design.

3.4 Being able to consider social, health, safety, legal, cultural and environmental constraints in the design of solutions to complex software engineering problems.

4. Research: Able to study complex software engineering problems based on software engineering principles and adopt scientific methods. By designing experiments, modeling and simulation, analyzing and interpreting data, obtain reasonable and effective conclusions through information synthesis

4.1 Being able to analyze the key links of complex software engineering problems based on computer science and software engineering theory and adopt scientific methods such as literature research, research, case analysis, modeling and simulation.

4.2 Select the research route, design the experimental scheme, build the experimental system, conduct experiments and collect the experimental data correctly, according to the specific object characteristics of complex software engineering solutions.

4.3 Being able to make theoretical analysis of experimental results, explain experimental phenomena, and draw reasonable and effective conclusions through information synthesis.

5. Use modern tools: Able to develop, select and use appropriate technologies, software, hardware and system resources, and modern development tools for the design, prediction, simulation and implementation of complex software engineering problems, and able to understand the limitations of the tools and resources used

5.1 Understand the use principles and methods of modern instruments, information technology tools, engineering tools and simulation software commonly used in software engineering majors, and understand their limitations.

5.2 Select and use appropriate instruments, develop or select modern tools that meet specific needs, simulate, predict, analyze or design specific objects, and analyze advantages and limitations, conform to the actual needs of solving complex engineering problems in the field of software engineering.

6. Engineering and society: can conduct reasonable analysis based on engineering background knowledge in the field of software engineering, evaluate the impact of engineering practices such as computer software and hardware development, system design and solutions to complex engineering problems on society, health, safety, law and culture, and understand the responsibilities to be assumed

6.1 Understand computer software-related technical standards, intellectual property protection, laws and regulations and industrial policies, and understand the impact of different social cultures on computer software-related engineering activities.

6.2 Being able to analyze and evaluate the interaction between specific software engineering



practices and solutions to complex engineering problems and society, health, safety, law and culture, and understand the responsibilities of engineers.

7. Environment and sustainable development: able to understand and evaluate the impact of professional engineering practices for complex software engineering problems on environmental and social sustainable development

7.1 Implement the Scientific Outlook on Development, be able to understand the concept and connotation of environmental protection and social sustainable development, understand the relationship between information technology and environmental protection, and be familiar with the guidelines, policies, laws and regulations of environmental protection and sustainable development of software industry.

7.2 Being able to analyze and evaluate the interaction between solutions and professional practices of complex software engineering problems and the objective world and the sustainable development of society.

8. Professional norms: have humanistic and social science literacy and social responsibility, can understand and abide by engineering professional ethics and norms in software engineering practice, and fulfill the responsibilities of an engineer

8.1 Having correct values, understand the relationship between individuals and society, understand China's national conditions and the development status of China's information industry.

8.2 Understand engineering professional ethics and codes of honesty, fairness and integrity, and be able to consciously abide by them in engineering practice.

8.3 Being able to understand the social responsibility of engineers for public safety, health and environmental protection, and can conscientiously fulfill the responsibility in engineering practice.

9. Individuals and Teams: Team-minded and capable of working in a multi-disciplinary team as an individual, team member and leader

9.1 Having team spirit, able to understand the division and importance of roles in a team, able to effectively communicate and cooperate with members of other disciplines.

9.2 Being able to work independently or cooperatively in a multi-disciplinary team, play the role of a leader, organize, coordinate and direct the team to carry out the work.

10. Communication: Able to effectively communicate and communicate with industry peers and the public on complex software engineering issues, including writing reports and design documents, making presentations, clearly expressing or responding to instructions, having a certain international perspective, and being able to communicate and communicate in a cross-cultural context

10.1 Being able to accurately express their views on professional issues orally, in writing, in charts, etc., respond to doubts, and understand the differences in communication with peers and the public in different ways and with different objects.

10.2 Understand the international development trends and research hotspots in the field of software engineering, understand and respect the differences and diversity of different cultures in the world.

10.3 Having the ability of language and written expression in cross-cultural communication, and be able to conduct basic communication and exchange on software engineering issues in cross-cultural background.

11. Project Management: Understand and master engineering management principles and economic decision-making methods and be able to apply them in a multidisciplinary environment

11.1 Understand the importance of project management and economic decision-making, and

master the management principles and economic decision-making methods involved in engineering projects.

11.2 Understand the cost structure of information system engineering and the whole cycle and process of products, and be able to apply management principles and economic methods in the process of designing and developing solutions to complex engineering problems in the field of software engineering in a multidisciplinary environment.

12. Lifelong learning: have the consciousness of self-learning and lifelong learning, and have the ability to master new technology and adapt to the new development of information technology through continuous learning

12.1 Being able to recognize the ever-changing development characteristics of software technology and recognize the necessity of autonomous learning and lifelong learning.

12.2 Having self-learning ability, able to expand their knowledge and ability through a variety of ways, including understanding ability, summarizing ability and the ability to ask questions.

### 三、培养特色

#### III. Program Highlights

1. 厚基础：夯实专业基础。学生须掌握软件工程领域扎实的理论基础和宽广的专业知识，在基础软件和大型工业软件等多个专业领域具有长期、深入发展潜质和竞争能力；

2. 强能力：强化能力素质。学生应具备运用先进的工程化方法、技术和工具，从事软件研发、维护、管理等工作的能力，以及工程项目的组织与管理能力、团队协作能力和创新能力；

3. 重实践：注重工程应用。采取国际合作、校企共建和层次化的工程实践能力培养体系，使学生掌握软件产业最新的开发流程和规范，具有快速参与国际化企业开发和解决大型软件工程项目的能力；

4. 育创新：培养创新思维。采用系统的课程学习、层次化的工程实践体系、创新项目驱动等多种培养方式，培养与国际接轨的国际化、复合型、工程型软件精英人才。

1. Solid foundation: consolidating professional foundation. Students should have a solid theoretical foundation and broad professional knowledge in the field of software engineering, and have long-term and in-depth development potential and competitiveness in many professional fields as infrastructural software and large-scale industrial software;

2. Strong ability: strengthening ability and quality training. Students should have the ability to apply advanced engineering methods, techniques and tools to conduct software development, maintenance and management, as well as the organization and management ability, team cooperation ability and innovation ability of engineering projects;

3. Emphasis in practice: paying attention to engineering application. With the help of international cooperation, school-enterprise coordination and a systematic engineering practical training program, students can master the latest development process and specification of software industry, and have the ability to quickly participate in the development in international enterprises and solve large-scale software engineering projects;

4. Seeking innovation: cultivating innovative thinking. The school adopts a variety of training methods, such as systematic course learning, hierarchical engineering practical training schedule, innovation/project driven learning, etc., to cultivate international awareness, compound and engineering software skills for the talents in line with international standards.

### 四、主干学科

#### IV. Main Discipline

软件工程

Software Engineering

## 五、学制与学位

### V. Program Length and Degree

学制：四年

Program Length : 4 years

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

## 六、学时与学分

### VI. Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：154.3 分

Minimum curriculum credits (including courses and practicum) : 154.3Credits

完成学业最低课外学分要求：4 学分（每生必须完成思政课社会实践，通过劳动教育类课程考核）

Minimum Extracurricular Credits: 4 credits (Each student is required to complete the social practice activity, to acquire credits of labor education)

#### 1. 课程体系学时与学分

##### Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学时比例（%）
素质教育通识课程		必修	588/30	20.22
		选修	160/10	5.50
学科基础课程		必修	1000/60.8	34.39
专业课程	专业核心课程	必修	168/10.5	5.78
	专业选修课程	选修	384/24	13.20
集中性实践教学环节		必修	38w/19	20.91
合计			2300+38w/154.3	100
其中，总实验（实践）学时及占比			744	25.58

Course Type		Required /Elective	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses		Required	588/30	20.22
		Elective	160/10	5.50
Discipline-related Courses		Required	1000/60.8	34.39
Major-specific Courses	Core	Required	168/10.5	5.78
	Elective	Elective	384/24	13.20
Internship and Practical Training		Required	38w/19	20.91
Total			2300+38w/154.3	100
Practicum Credits			744	25.58

#### 2. 集中性实践教学环节周数与学分

##### Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例（%）
军事训练	必修	2/1	5.26
课程设计、课程实验	必修	13/6.5	34.21
专业实训	必修	9/4.5	23.68
毕业设计（论文）	必修	14/7	36.84
合计		38/19	100

华中科技大学 2022 级本科专业培养计划

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2/1	5.26
Course Project	Required	13/6.5	34.21
Professional Practice	Required	9/4.5	23.68
Undergraduate Thesis	Required	14/7	36.84
Total		38/19	100

3. 课外学分

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		课外学分
1	社会实践活动	提交社会调查报告,通过答辩者		2
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者		2
2	思政课社会实践(必修)	提交调查报告, 取得成绩		2
3	劳动教育(必修)	32 学时		2
4	英语及计算机考试	全国大学英语六级考试	获六级证书者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文	在国内外刊物发表论文	每篇论文	2-3
7	科研	视参与科研项目时间与科研能力	每项	1-3

No.	Activities	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submitting a report and passing the oral defense		2
		Individuals awarded "Active Participant" / Teams awarded "Excellent Performance" by HUST or Hubei Youth League Committee		2
2	Ideological and political course Social Practice	Submit a report and obtain a passing score		2
3	Labor Education	Acquire credits of one of the three provided courses		2
4	Examinations in English and Computer	CET-6	Certificate	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	300 Points or Higher	3
		National Computer Rank Examination	Certificate (Grade 1 / 2)	2

continue

No.	Activities	Requirements		Extracurricular Credits
4	Examinations in English and Computer	Qualifications for Computer and Software Technology Proficiency	Programmer	2
			Senior Programmer	3
			System Analyst	4
5	Competitions	University Level	First prize	3
			Second prize	2
			Third prize	1
		Provincial Level	First prize	4
			Second prize	3
			Third prize	2
		National Level	First prize	6
			Second prize	4
			Third prize	3
6	Academic Papers	Publish papers in domestic and foreign journals	Each paper	2-3
7	Research Programs	Contribution and research capability	Each program	1-3

## 七、主要课程及创新（创业）课程

### VII. Main Courses and Innovation (Entrepreneurship) Courses

#### 1. 主要课程 Main Courses

软件工程理论与实践 Introduction to Software Engineering、数据结构 Data Structures、操作系统原理 Principle of Operating Systems、软件体系结构 Software Architecture、数据库系统原理 Principle of Database Systems、编译技术 Compiler Techniques、算法设计与分析 Algorithm Design and Analysis、人工智能导论 Introduction to Artificial Intelligence、软件质量与测试 Software Quality and Testing.

#### 2. 创新（创业）课程 Innovation (Entrepreneurship) Courses

创新意识启迪类课程：批判性思维 Critical Thinking、创新思维与创新实践 Innovative Thinking and Practice. 创新能力培养类课程：前沿技术讲座 Lectures of Up-to-date Technology、创新创业讲座 Innovation and Entrepreneurship Lectures

创新实践训练类课程：专业实训（一）Engineering Internship (I)、专业实训（二）Engineering Internship (II)、专业实训（三）Engineering Internship (III)

## 八、主要实践教学环节（含专业实验）

### VIII. Practical Module (experiments Included)

C 语言程序设计实验 Advanced Programming Language Labs (C)、软件设计综合实践 Course Project of Data Structure、操作系统设计与实践 Operating Systems Principles Labs、编译技术课程设计 Course Project of Compiler Techniques、数据库系统原理课程设计 Database Systems Principles Labs、软件工程理论与实践课程设计 Course Project of Introduction to Software Engineering、军事训练 Military Training、专业实训 Professional Internship、毕业设计 Undergraduate Thesis.

## 九、教学进程计划表

### IX. Course schedule

院（系）：软件学院

School (Department): School of Software Engineering

专业：软件工程

Major: Software Engineering

华中科技大学 2022 级本科专业培养计划

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Morals & Ethics & Law	40	2.5	8 (课外)		1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Basic Principles of Marxism	40	2.5			3
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0032	形势与政策 Current Affairs and Policy	48	1.5			5-7
	必修 Required	SFL0001	综合英语 (一) Comprehensive English ( I )	56	3.5			1
	必修 Required	SFL0011	综合英语 (二) Comprehensive English ( II )	56	3.5			2
	必修 Required	PHE0002	大学体育 (一) Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育 (二) Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育 (三) Physical Education ( III )	24	1			5-6
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			1
	选修 Elective		从不同的课程模块中修读若干课程, 美育类、大学生心理健康课程均不低于 2 学分, 总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0551	微积分 (一) 上 Calculus ( I )	88	5.5			1
	必修 Required	MAT0531	微积分 (一) 下 Calculus ( I )	88	5.5			2
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physics Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physics Experiments ( II )	24	0.8	24		3
	必修 Required	MAT0721	线性代数 Linear Algebra	40	2.5			1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0591	概率论与数理统计 Probability and Mathematics Statistics	40	2.5			3
	必修 Required	SSE0591	信息技术导论 Introduction to Information Technologies	24	1.5		8	1
	必修 Required	SSE0601	C 语言程序设计 Advanced Programming Language (C)	48	3			1
	必修 Required	SSE0551	离散数学 Discrete Mathematics	80	5			2
	必修 Required	SSE0561	数据结构 Data Structures	48	3			3
	必修 Required	SSE0581	数字逻辑 Digital Logic	48	3		8	4
	必修 Required	SSE0521	操作系统原理 Principle of Operating Systems	48	3			4
	必修 Required	SSE0631	批判性思维 Critical Thinking	16	1			4
	必修 Required	SSE0541	计算机组成原理 Principles of Computer Organization	48	3		8	5
	必修 Required	SSE0641	数据库系统原理 Database Systems Principles	48	3			5
	必修 Required	SSE0511	编译技术 Compiler Techniques	48	3			5
	必修 Required	SSE0611	创新思维与创新实践 Innovative Thinking and Practice	16	1			6
	必修 Required	SSE5191	计算机网络 Computer Networks	48	3		16	6
专业核心课程 Major-specific Core Courses	必修 Required	SSE2132	软件工程理论与实践 Theory and Practice of Software Engineering	40	2.5		8	4
	必修 Required	SSE2122	算法设计与分析 Algorithm Design and Analysis	32	2		8	4
	必修 Required	SSE2072	软件体系结构 Software Architecture	32	2		8	5
	必修 Required	SSE2092	人工智能导论 Introduction to Artificial Intelligence	32	2		8	5
	必修 Required	SSE5511	软件质量与测试 Software Quality and Testing	32	2		8	6
专业选修课程（需修满 24 学分） Elective courses below should be taken to get 24 credits.								
	选修 Elective	SSE5611	数据科学导论 Introduction to Data Science	32	2		8	2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置学期 semester
						实验 exp.	上机 operation	
专业选修课程 Major-specific Electives	选修 Elective	SSE2031	面向对象程序设计 Object-Oriented Programming	32	2			3
	选修 Elective	SSE5352	微机原理与接口技术 Microcomputer Principle and Interface Techniques	64	4		20	5
	选修 Elective	SSE5521	数学建模与最优化 Mathematical Modeling and Optimization	48	3		4	5
	选修 Elective	SSE5321	数字图像处理技术 Digital Image Processing Techniques	40	2.5		12	5
	选修 Elective	SSE5211	面向对象系统分析与设计 Object-Oriented System Analysis and Design	48	3		16	5
	选修 Elective	SSE2081	软件文档写作 Software Documentation Writing	16	1		4	6
	选修 Elective	SSE5401	虚拟现实技术 Virtual Reality Technology	32	2		12	6
	选修 Elective	SSE5201	计算机游戏设计 Computer Games Design	32	2		12	6
	选修 Elective	SSE5041	ERP 与供应链 ERP and Supply Chain	32	2		12	6
	选修 Elective	SSE5531	云计算 Cloud Computing	32	2			6
	选修 Elective	SSE5181	计算机图形学 Computer Graphics	40	2.5		8	6
	选修 Elective	SSE5471	机器学习导论 Introduce to Machine Learning	32	2		8	7
	选修 Elective	SSE5231	前沿技术讲座 Lectures of Up-to-date Technology	16	1			7
	选修 Elective	SSE5071	创新创业讲座 Innovation and Entrepreneurship Lectures	16	1			7
	选修 Elective	SSE5681	区块链技术 Blockchain Technology	32	2			7
	选修 Elective	SSE5131	嵌入式操作系统 Embedded Operating Systems	32	2			7
实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	SSE0602	C 语言程序设计实验 Programming Language Labs (C)	32	1			1
	必修 Required	SSE3721	软件设计综合实践 Course Project of Software Design	32	1			3
	必修 Required	SSE3731	操作系统设计与实践 Operating System Design and Practice	32	1			4
	必修 Required	SSE3751	软件工程理论与实践课程设计 Course Project of Software Engineering	64	2			4



续表

课程 类别 course type	课程 性质 required/ elective	课程 代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including		设置 学期 semester
						实验 exp.	上机 operation	
实践环节 Practical Training Items	必修 Required	SSE3701	编译技术课程设计 Course Project of Compiler Techniques	16	0.5			5
	必修 Required	SSE3741	数据库系统原理课程设计 Database Systems Principles Labs	32	1			5
	选修 Elective	SSE3581	面向对象系统分析与设计课程设计 Course Project of Object-Oriented system Analysis and design	16	0.5			5
	选修 Elective	SSE3661	AR/VR 课程设计 Course Projects for AR/VR	24	0.75			7
	必修 Required	SSE3611	专业实训（一） Engineering Internship（I）	2w	1			2
	必修 Required	SSE3621	专业实训（二） Engineering Internship（II）	3w	1.5			4
	必修 Required	SSE3631	专业实训（三） Engineering Internship（III）	4w	2			6
	必修 Required	SSE3511	毕业设计（论文） Undergraduate Thesis	14w	7			8

## 未来技术学院

华中科技大学未来技术学院是教育部 2021 年 5 月批准成立的首批 12 所未来技术学院之一。学院着眼于未来科学技术原创，旨在建立以交叉学科研究为基础的人才培养模式，培养具有前瞻性、能够引领未来发展的科技创新领军人才。

未来技术学院聚焦“大工程大健康”未来战略产业发展，依托机械工程、生物医学工程、光电信息科学与工程、自动化等国家一流本科专业的优质科教资源，发挥武汉光电国家研究中心、国家数字化设计与制造创新中心等重大科学研究平台以及国家集成电路产教融合创新平台科教协同育人、产教融合的优势，凝练先进智能制造、生物医学成像、光电子芯片与系统、人工智能等未来交叉学科技术方向，探索专业交叉、科教协同、产教融合的新工科人才培养新模式，着力培养驱动科学研究、引领未来科技和产业变革的人才，打造未来技术领军人才培养基地。

## 未来技术学院本硕博实验班培养计划（机械方向）（本研贯通）

### Program for Bachelor-Master-PhD Experimental Class, School of Future Technology

#### 一、培养目标

##### I. Program Objectives

致力于培养德、智、体、美、劳全面发展，科学和工程基础知识扎实，在机械工程、生物医学工程、光电信息科学与工程、自动化等领域具有宽广的专业及跨专业知识，具有多学科视野和国际竞争力的拔尖创新领军人才。毕业生能在未来交叉学科技术方向持续深造，在未来社会急需的智能制造、智能感知、智能健康等技术领域引领科技和产业变革。

The program aims to cultivate tip-top internationalized talents with cross-disciplinary vision. The graduates will have solid foundation in science and engineering with both breadth and depth in fields of Mechanical Engineering, Biomedical Engineering, Optoelectronic Information Science and Engineering, or Automation. The graduates will pursue post-graduate studies at world class graduate schools in cross-disciplinary areas, and are expected to contribute to technical innovation and industrial revolution in Intelligent Manufacturing, Intellisense and Intelligent Health.

#### 二、基本规格要求

##### II. Skills profile

毕业生应达到如下要求：

1. 具有科技报国的家国情怀和使命担当，良好的品德修养，良好的科学与工程伦理素养。
2. 具有较好的人文艺术和社会科学素养，较强的社会责任感和良好的职业道德，良好的语言表达能力和人际交往能力；
3. 了解机械工程知识，并具有应用数学、自然科学和工程学知识解决工程学与生物学交叉问题的能力；
4. 具有制订实验方案、进行实验、分析和解释数据的能力；
5. 具有设计一个系统、一个部件或一个过程的能力；
6. 具有对工程问题进行系统表达、建立模型、分析求解和论证的能力；
7. 具有在工程实践中运用各种技术、技能和现代工程工具的能力；
8. 具有创新意识和从事科学研究的初步能力，具有团队合作精神，在多学科工作集体中发挥作用的能力；
9. 能正确认识工程和机器人对于客观世界、经济、环境和社会的影响，了解与本专业相关的法律法规，熟悉环境保护和可持续发展等方面的方针和政策；
10. 具有国际视野、终生教育的意识和继续学习的能力；
11. 至少掌握一门外语，能熟练阅读本专业外文资料，具有良好的听说能力和跨文化的交流与合作能力。

Graduates should have the following knowledge and capacity:

1. Patriotism and sense of responsibility to support national construction with science and technology strength, good moral quality, a high science and engineering ethical standard;
2. A knowledge of liberal arts and social sciences, an understanding of social, professional and

ethical responsibility, and an ability to communicate effectively in oral, written and visual forms.

3. An understanding of mechanical engineering, and the capability to apply advanced mathematics, science, and engineering to solve problems at the interface of engineering and biology.

4. An ability to design and conduct experiments, to analyze and interpret data, and to report findings.

5. An ability to design a system, component, or process to meet specifications.

6. An ability to identify, formulate, analyze and solve engineering problems.

7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

8. Innovative thinking, team spirit, a preliminary ability to conduct scientific research, and an ability to function in multi-disciplinary teams.

9. An understanding about the impact of engineering and robotic solutions in a global, economic, environmental, and societal context, a knowledge of laws and regulations relevant to engineering, environmental protection and sustainable development.

10. International vision, a recognition of the need for and an ability to engage lifelong learning to remain effective in a climate of continually emerging technologies.

11. A mastery of at least one foreign language, an ability to read foreign references and conduct inter-cultural communication and cooperation.

### 三、培养特色

#### III. Program Features

指导思想：

- 宏观思维能力（系统观念、人文情怀，问题视野，领导力）
- 科学和工程素养（数理化生基础扎实，科学与工程并重）
- 多学科视野（专业能力培养，多专业方向知识，基于项目进行多学科交叉学习）
- 跨文化交流沟通能力（国际化师资，国际交流平台）

Guiding principles:

- Comprehensive thinking (Systematic consideration, humanistic feelings, problem-based view, leadership)
- Science and Engineering knowledge (A solid base of knowledge in mathematics, physics, chemistry and biology; Combination between science and engineering)
- Multidisciplinary view (Track for one major, knowledge for multiple majors, crossing learning by doing project)
- Cross-culture communication skills (Internationalized faculties, international exchange platform)

以培养工学博士为目标，衔接本科教育阶段。以未来技术创新与应用为方向，构建核心基础课程群为主体、个性化交叉课程为辅的课程体系，遵行“群体培养与多元发展相统一、工程实践与科学思维相统一”的人才培养理念，坚持多学科交叉培养、个性化、小班化、国际化、导师制的培养特色，整个本科阶段，导师指导不断线，理论学习不断线，科研实践不断线。

实施“3+1+X”的过程培养模式。前三年，按照机械大类，推行创新素质教育；第四年，自主选择交叉模块进行学习并与研究生阶段衔接。渐进式培养过程中，实行竞争分流和阶段之间有机衔接，本硕连读，并优先推荐免试攻读博士学位。

This program is the undergraduate stage of cultivating engineering doctor. The talent ability training focuses on mechanical engineering, and is oriented by their applications in mechanical

engineering systems. The curriculum is based on the core courses group, supplemented by personalized and diversified courses. Talent training follows the concept of “the unity of group training and diversified development, the unity of engineering practice and scientific thinking”. This program implements a multi-disciplinary, personalized, small-class, international and mentor-led training system. Mentor guidance, theoretical study and scientific research Practice will run through the entire undergraduate stage.

The process culture mode of “3+1+X” is adopted. In the first three years, we will implement innovative quality education in accordance with mechanical engineering classes. In the fourth year, as the connecting stage of undergraduate and graduate student, in addition to continuing to study undergraduate courses according to the requirements of the training plan, you can also study some graduate courses. In the fifth year, you can begin your doctoral study. In the process of progressive training, competitive diversion and effective linkage between stages will be implemented. Students will continue to study for undergraduate and master’s degrees, and give priority to the test-free recommendation to study for a doctorate.

#### 四、主干学科

##### IV. Major Discipline

光电信息科学与工程

Optoelectronic Information Science and Engineering

集成电路与集成系统

Integrated Circuits & Integrated Systems

机械工程

Mechanical Engineering

机器人

Robotics

人工智能

Artificial Intelligence

生物医学工程

Biomedical Engineering

#### 五、学制与学位

##### V. Program Length and Degree

学制：最低学习年限 8 年，最长学习年限 10 年。

Program Length: Four years

授予学位：工学博士

第一次分流：第 4 年完成本科环节学业可申请学士学位，第二次分流：第 5 年博士开题未通过但完成硕士学业可在第 7 年申请硕士学位。

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

##### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：202.8

Minimum Credits of Curriculum (Comprising course system and intensive practical training and internship): 202.8

完成学业最低课外学分要求：5

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Minimum Extracurricular Credits: 5

1. 课程体系学时与学分

Hours/Credits of Course System

● 博士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	572/29	14.3
	选修	160/10	4.9
学科基础课程	必修	1084/64.8	32
专业核心课程	必修	480/30	14.8
本硕衔接课程	必修	398/24	11.8
博士阶段课程	必修	164/10	4.9
集中性实践教学环节(本科阶段)	必修	45w/16	7.9
集中性实践教学环节(博士研究生阶段)	必修	19	9.4
总计		2858+45w/202.8	100
其中, 总实验(实践)学时学分		886/63	31

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	572/29	14.3
	Elective	160/10	4.9
Discipline-related General Courses	Required	1084/64.8	32
Professional Core Curriculum	Required	480/30	14.8
Undergraduate Pathway Programs	Required	398/24	11.8
PhD level courses	Required	164/10	4.9
Internship and Practical Training (Undergraduate)	Required	45w/16	7.9
Research (Postgraduate)	Required	19	9.4
Total		2858+45w/202.8	100
Practicum Credits		886/63	31

● 硕士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	572/29	15.5
	选修	160/10	5.3
学科基础课程	必修	1084/64.8	34.7
专业核心课程	必修	480/30	16.1
硕士阶段课程(其中本硕衔接阶段至少 12 学分)	必修	398/24	12.8
集中性实践教学环节(本科阶段)	必修	45w/16	8.6
研究环节(硕士研究生阶段)	必修	13	7
总计		2694+45w/186.8	100
其中, 总实验(实践)学时学分		808/56	30

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	572/29	15.5
	Elective	160/10	5.3
Discipline-related General Courses	Required	1084/64.8	34.7
Professional Core Curriculum	Required	480/30	16.1
Undergraduate Pathway Programs	Required	398/24	12.8
Internship and Practical Training (Undergraduate)	Required	45w/16	8.6
Research (Master)	Required	13	7
Total		2694+45w/186.8	100
Practicum Credits		808/56	30

## 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensified Internship and Practical Training

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	2.9
专业方向课程设计	必修	2w/1	2.9
创新项目实践	必修	6w/3	8.5
企业项目实践	必修	4w/2	5.7
毕业设计(论文)	必修	16w/6	17.1
实验室轮转	必修	15w/3	8.6
开题报告	必修	1	2.9
论文中期进展报告	必修	1	2.9
参加国内外学术会议并提交论文	必修	1	2.9
发表学术论文	必修	1	2.9
博士学位论文	必修	15	42.7
合计	必修	35	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	2.9
Discipline Perceive Practice	Required	2w/1	2.9
Innovative Project Practice	Required	6w/3	8.5
Entrepreneurial Project Practice	Required	4w/2	5.7
Undergraduate Thesis	Required	16w/6	17.1
Lab rotation	Required	15w/3	8.6
Literature reading and the report on subject selection	Required	1	2.9
Thesis Interim Progress Report	Required	1	2.9
Participation in International academic conferences	Required	1	2.9
Publish academic papers	Required	1	2.9
Doctoral Dissertation	Required	15	42.7
Total	Required	35	100

## 3. 课外学分(本科阶段)

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求	学分
1	社会实践活动	提交社会调查报告, 通过答辩者	1
		个人被校团委或团省委评为社会实践活动积极分子者, 集体被校团委或团省委评为优秀社会实践队者。	2
2	思政课社会实践(必修)	提交调查报告, 取得成绩	2
3	劳动教育(必修)	32 学时	2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者
		托福考试	达 90 分以上者
		雅思考试	达 6.5 分以上者
		GRE 考试	达 325 分以上者
		全国大学英语口语成绩	A, B, C,
		全国计算机等级考试	获二级以上证书者
		全国计算机软件资格、水平考试	获程序员证书者
			获高级程序员证书者
			获系统分析员证书者
5	竞赛	校级	获一等奖者
			获二等奖者
			获三等奖者
		省级	获一等奖者
			获二等奖者
			获三等奖者

续表

序号	课外活动名称	课外活动和社会实践的要求		学分
5	竞赛	全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文、专利	根据论文水平	每篇论文	2-5
		发明专利授权	每项前两名	2
		实用新型、软件著作权	每项前两名	1
7	参加科研和创新设计活动	参与科研项目时间与科研能力；纳入创新计划；提交结题报告、导师审查评分、学院审核。		1-3

说明：参加校级体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六名至第八名者与校级三等奖等同。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		1
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group that is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and Political Course Social Practice	Submit a report and obtain a passing score		2
3	Public Service Work	(Labor education) (required 32 Hours/2 Credits)		2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CET Oral Examination	A、B、C	3,2,1
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
5	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
6	Papers, Patent	Published in national-level journals	Per piece	2-5
		Patent of invention	Per piece	2
		Utility model patent	Top two of each item	1
7	Scientific Research and Extracurricular Activity	Depending on time and quality of the research; Selected by the innovation scheme; Submit report, scored by supervisors, evaluated by the School		1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level.



## 七、教学进程计划表

## VII. Course Schedule

## (一) 本科阶段学位课程

院(系): 未来技术学院

专业: 依据专业方向

School: School of Future Technology

Major: Mechanical Design, Manufacturing and Automation

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Ethics and Rule of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Theory of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	PHE0002	大学体育(一) Physical Education (I)	60	1.5			1-2
	必修 Required	PHE0012	大学体育(二) Physical Education (II)	60	1.5			3-4
	必修 Required	PHE0022	大学体育(三) Physical Education (III)	24	1			5-6
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	必修 Required	SFL0003	综合英语(一) Comprehensive English (I)	48	3			1
	必修 Required	SFL0013	综合英语(二) Comprehensive English (II)	48	3			2
	选修 Elective		从不同的课程模块中修读若干课程:含美育类课程、经济管理类课程和大学生心理健康课程各 2 学分,总学分不低于 10 学分 General Education Courses (elective)	160	10			2-8
学科基础课程 Discipline-related General Courses	必修 Required	MAT0552	微积分(A)上 Calculus (I)	96	6			1
	必修 Required	MAT0532	微积分(A)下 Calculus (II)	96	6			2
	必修 Required	MAT0722	线性代数(A) Linear Algebra (A)	48	3			1
	必修 Required	MAT0592	概率论与数理统计(A) Probability and Mathematics Statistics (A)	48	3			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics Special Functions	40	2.5			4
	必修 Required	PHY0511	大学物理（一） Physics（I）	64	4			2
	必修 Required	PHY0521	大学物理（二） Physics（II）	64	4			3
	必修 Required	PHY0551	物理实验（一） Physical Experiments（I）	32	1	32		2
	必修 Required	PHY0561	物理实验（二） Physical Experiments（II）	24	0.8	24		3
	必修 Required	MESE0891	工程制图（一） Engineering Graphics（I）	40	2.5		(12)	1
	必修 Required	QMX0011	科学思维与研究方法（新生研讨课） Method of Scientific Thinking and Research	16	1			1
	必修 Required	SFT0001	普通化学 General Chemistry	64	3.5	16		2
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	SFT0031	数据结构与算法设计 Data Structure and Algorithm Design	60	3		24	3
	必修 Required	SFT0021	科技阅读与写作 Academic Reading and Writing	32	2			3
	必修 Required	OEI5801	人工智能导论 Foundation of Artificial Intelligence	32	2			4
	必修 Required	SFT0041	单片机与嵌入式系统 Microcontroller & Embedded System	72	4.5	8		5
	必修 Required	EIC2131	线性电路理论与实验 Circuit Theory and Experiments	72	4.5	16		4
	必修 Required	MASE5311	工程材料学 Engineering Materials	32	2	4		4
	必修 Required	AE0671	工程力学 Engineering Mechanics	64	4	6		4
专业核心课程 Major-Specific Core Courses	必修 Required	MESE5821	学科（专业）概论 An Introduction to Discipline （Mechanical Engineering）	16	1			3
	必修 Required	MESE1141	智能制造装备与工艺（一） Intelligent Manufacturing Equipment and Technology（I）	40	2.5	4		4
	必修 Required	MESE2391	智能制造装备与工艺（二） Intelligent Manufacturing Equipment and Technology（II）	88	5.5	12		5
	必修 Required	MESE2381	机电控制与检测（二） Mechantronic Control and Measurement（II）	88	5.5	24		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
专业核心课程 Major-Specific Core Courses	必修 Required	NAO0571	流体力学（一） Fluid Mechanics（I）	32	2	4		5
	必修 Required	MESE2401	机械设计理论与方法（二） Theory and Methodology of Mechanical Engineering Design（II）	88	5.5	8		5
	必修 Required	MESE5661	机器人学 Robotics	48	3	4+(4)		6
	四选一 One out of Four	MESE5731	数控技术 Numerical Control Technology	48	3	4+(4)		6
		MESE5831	液压与气压传动 Hydraulic and Pneumatic Transmission	48	3	4		6
		MESE2391	智能制造装备与工艺（三） Intelligent Manufacturing Equipment and Technology（III）	48	3	4		6
		MESE6331	机械设计理论与方法（三） Theory and Methodology of Mechanical Engineering Design（III）	48	3		16	6
	必修 Required	SFT0111	热力学与统计力学 Thermodynamics and Statistical Mechanics	32	2			5

\* 如仅学士学位毕业，后续研究生学位课程中仍需完成本硕衔接一级基础课和二级基础课要求。

## （二）研究生阶段学位课程

类别		课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注	
课程	硕士阶段 (校级公共必修课程)	408110001	自然辩证法概论	18	1	春秋学期	马克思主义学院	校级公共课 在 7-10 学期 完成	
		408130001	新时代中国特色社会主义理论与实践研究	36	2	春秋学期	马克思主义学院		
411130003		第一外国语（英语一）	32	2	春秋学期	外国语学院	修满 5 学分		
学位课程	硕士阶段 (校级公共选修课程)	100130001	工程伦理	16	1	秋学期	机械科学与工程学院	校级公共课 在 7-10 学期 完成	
		110130001	纳米技术与应用	32	2	秋学期	材料科学与工程学院		
		121130001	新能源技术	32	2	秋学期	能源与动力工程学院		
		184130001	面向对象的程序设计	32	2	秋学期	人工智能与自动化学院		
		184130002	人工智能导论	16	1	秋学期	人工智能与自动化学院		
		210130001	数据库设计与实现	32	2	秋学期	计算机科学与技术学院		
		261130001	环境工程导论	16	1	秋学期	环境科学与工程学院		
		300130001	现代管理理论与方法	32	2	春学期	管理学院		修满 1 学分
		300130002	知识产权	16	1	春学期	管理学院		
		400130001	中国传统文化评析	16	1	春学期	人文学院		
		503130001	情报检索	24	1.5	春秋学期	图书馆		
		513130001	心理压力与应对	16	1	秋学期	公共卫生学院		
	学科通识课	100132001	学术规范与论文写作(机械学院)	24	1.5	秋学期	机械科学与工程学院	要求 7-8 学期 机械学院学生必修	
								修满 1 学分	

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类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	100131001	数值方法 Numerical Methods	48	3	秋学期	机械科学与工程学院	要求第 7, 8 学期, 一级基础课至少选修 2 门 修满 4 学分
	100131003	现代控制工程 The Principle of Modern Control Engineering	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (一级基础课)	100131004	有限元分析及应用 Finite Element Analysis and Applications	32	2	秋学期	机械科学与工程学院	
	100131002	计算力学 Computational Mechanics	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131005	数字信号分析理论与实践 Digital Signal Processing Theory and Practice	48	3	秋学期	机械科学与工程学院	
	100131006	机械振动学 Mechanical Vibration	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131007	运筹学 Operations Research	32	2	秋学期	机械科学与工程学院	
	100131009	现代制造过程技术 Advanced Manufacturing Technology	32	2	秋学期	机械科学与工程学院	要求第 7, 8 学期, 二级基础课至少选修 2 门 修满 4 学分
学位课程	100131010	微纳制造技术基础 Fundamentals of Micro- and Nano Fabrication	32	2	秋学期	机械科学与工程学院	
	100131011	工程测试与信号分析 Engineering measurement and Signal analysis	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131013	现代数控技术 Modern Numeric Control Technology	32	2	秋学期	机械科学与工程学院	
	100131008	机电一体化控制技术与系统 Mechatronics Control Technology and System	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131014	计算机图形学 Computer Graphics	32	2	秋学期	机械科学与工程学院	
	100131015	计算几何与算法设计 Computational Geometry and Algorithms	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131016	软件工程与面向对象技术 Software engineering and Object-oriented programming	32	2	秋学期	机械科学与工程学院	
	100131017	多体系统动力学 Multibody System Dynamics	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131018	精密测量原理和技术 Precision Measurement Principle and Technology	32	2	秋学期	机械科学与工程学院	
	100131034	管理学 Management	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131035	光电检测技术 Optoelectronic Detection Technology	32	2	秋学期	机械科学与工程学院	
	100131061	仪器智能 Instrument Intelligence	32	2	秋学期	机械科学与工程学院	
本硕衔接课程 (二级基础课)	100131069	机械创新设计 Mechanical Creative Design	32	2	春学期	机械科学与工程学院	
	100131049	生产计划与控制 Production Planning and Control	32	2	秋学期	机械科学与工程学院	

续表

类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	本硕衔接课程 (数学课)	011110001 矩阵论	48	3	秋学期	数学与统计学院	要求第 7, 8 学期, 数学课限选一门  修满 3 学分
		011110002 数值分析	48	3	春学期	数学与统计学院	
		011110004 数理统计	48	3	秋学期	数学与统计学院	
		011110005 随机过程	48	3	秋学期	数学与统计学院	
	硕士专业选修课	100131019 增材制造 Additive Manufacturing	32	2	秋学期	机械科学与工程学院	第 9, 10 学期, 要求专业选修课 2 门  修满 4 学分
		100131020 CAD 技术及应用 CAD Technology and Applications	32	2	秋学期	机械科学与工程学院	
		100131021 薄膜技术 Thin Film Technology	32	2	秋学期	机械科学与工程学院	
		100131022 不确定性系统分析 Uncertainty Quantification & Analysis in Systems Modeling and Simulation	32	2	秋学期	机械科学与工程学院	
		100131023 产品全生命周期管理 Product Lifecycle Management	32	2	秋学期	机械科学与工程学院	
		100131024 车辆系统动力学工程实践 Engineering Practice in Vehicle System Dynamics	32	2	秋学期	机械科学与工程学院	
		100131025 电液控制系统现代设计方法 Modern Design Method on Electro-hydraulic Control System	32	2	秋学期	机械科学与工程学院	
		100131026 工程实验设计 Design and Analysis of Engineering Experiments	32	2	秋学期	机械科学与工程学院	
		100131027 工程优化设计方法 Optimal Design Methods in Engineering	32	2	秋学期	机械科学与工程学院	
		100131029 运动控制原理及技术 The Principle and technology of the Motion Control System	32	2	秋学期	机械科学与工程学院	
		100131030 功能材料基础与应用 Foundation and Applications of Function Materials	32	2	秋学期	机械科学与工程学院	
		100131031 供应链管理基础 Basics on Supply Chain Management	32	2	秋学期	机械科学与工程学院	
		100131032 故障诊断学 Fault Diagnostics	32	2	秋学期	机械科学与工程学院	
		100131033 管理信息系统分析与设计 Analysis & Design of Management Information System	32	2	秋学期	机械科学与工程学院	
		100131036 机电系统动力学分析与控制 Dynamic analysis and Control of Mechatronic Systems	32	2	秋学期	机械科学与工程学院	
		100131038 机器人操作系统 Robotic Manipulation System	32	2	秋学期	机械科学与工程学院	
		100131039 基于大数据的智能化数控系统实验课程 Experimental course of Intelligent CNC System Based on Big Data	32	2	秋学期	机械科学与工程学院	
		100131040 基于微机电系统的仪器原理与测控技术 The Theory and Technology of Instrumentation Based on Micro Electro Mechanical Systems (MEMS)	32	2	秋学期	机械科学与工程学院	

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续表

类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程		智能制造系统 Intelligent Manufacturing System	32	2	秋学期	机械科学与工程学院	
	100131042	精密机械设计 Precision Machine Design	32	2	秋学期	机械科学与工程学院	
	100131043	精密减振 Precision Vibration Isolation	32	2	秋学期	机械科学与工程学院	
	100131044	开放式数控系统理论及应用 The Theory and Application of Open CNC System	32	2	秋学期	机械科学与工程学院	
	100131046	气动控制及自动化技术 pneumatics and automatics	32	2	秋学期	机械科学与工程学院	
	100131047	人机协作与交互 Human Robot Cooperation and Interaction	32	2	春学期	机械科学与工程学院	
	100131048	柔性电子器件与制造 Flexible Electronic Device and Manufacturing	32	2	秋学期	机械科学与工程学院	
	100131050	水液压技术 Water Hydraulic Transmission	32	2	秋学期	机械科学与工程学院	
	100131051	椭圆测量学 Introduction to Ellipsometry	32	2	秋学期	机械科学与工程学院	
	100131052	微机电系统封装技术基础 Fundamentals of Microsystems Packaging	32	2	秋学期	机械科学与工程学院	
	100131053	微纳测试技术 Micro and Nano Metrology	32	2	秋学期	机械科学与工程学院	
	100131054	微纳系统仿真 Micro/Nano System Simulation	32	2	秋学期	机械科学与工程学院	
	100131055	高端无损检测 Advanced Nondestructive Testing	32	2	秋学期	机械科学与工程学院	
	100131056	物流系统工程 Logistics System Engineering	32	2	秋学期	机械科学与工程学院	
	100131057	系统仿真 System simulation	32	2	秋学期	机械科学与工程学院	
	100131058	现代数控编程与机器人加工技术 Numerical Control Programming & Robot Machining Technology	32	2	秋学期	机械科学与工程学院	
	100131059	项目管理学 Project Management	32	2	秋学期	机械科学与工程学院	
	100131060	信息系统安全技术 Security Technology of Information System	32	2	秋学期	机械科学与工程学院	
	100131062	噪声与振动控制 Noise, Vibration and its Control	32	2	秋学期	机械科学与工程学院	
	100131063	制造系统的智能控制、监控与诊断 Intelligent control, Monitoring and Diagnosis for Modern Manufacturing System	32	2	秋学期	机械科学与工程学院	
	100131064	制造执行系统与数字化车间 Manufacturing Execution System and Digital Workshop	32	2	秋学期	机械科学与工程学院	
	100131065	制造装备智能化控制技术 Manufacturing Equipment Intelligent Technology	32	2	秋学期	机械科学与工程学院	

续表

类别	课程代码	课程名称	学时	学分	季节	开课单位	修读要求 备注
学位课程	硕士专业选修课	100131066 智能移动机器人 An Introduction to Autonomous Mobile Robots	32	2	秋学期	机械科学与工程学院	
		100131067 智能优化方法 Intelligent Optimization Methods	32	2	春学期	机械科学与工程学院	
		100131068 自由曲面加工理论及应用 Theory and Applications of Sculptured Surface Machining	32	2	秋学期	机械科学与工程学院	
		100131072 智能检测仪器的工程化设计 Engineering Design of Intelligent Testing Instrument	32	2	秋学期	机械科学与工程学院	
	跨一级学科课程	从学院其他方向中任选 1 门	32	2	春秋学期	机械科学与工程学院	第 9, 10 学期, 要求跨一级学科 1 门 (从学院其他方向中任选 1 门) 修满 2 学分
	博士阶段课程 (校级公共课)	408210001 中国马克思主义与当代 Chinese Marxism	36	2	秋学期	马克思主义学院	第五年末完成博士开题后, 进入博士阶段课程学习 修满 4 学分
		411210001 英语论文写作 English Academic Writing	32	2	秋学期	外国语学院	
	博士专业选修课	100231001 先进制造工程学 Advanced Manufacturing Engineering	64	4	秋学期	机械科学与工程学院	第六年要求学习 2 门博士专业选修课程 修满 4 学分
		100231002 现代设计学 Modern Design Methodology	48	3	秋学期	机械科学与工程学院	
	跨学科课程	可以选其他校级公选课或者其他方向的研究生专业课	32	2	春秋学期		第 11, 12 学期, 要求跨一级学科 1 门 (从学院其他方向中任选 1 门), 由导师指定 修满 2 学分

## (三) 实践/研究环节

类别	课程代码	课程名称	学时	学分	学期	开课单位	修读要求 备注
本科实践环节 Undergraduate Practical Training Items	RMWZ3511	军事训练 Military Training	2w	1	1		必修
	SFT0171	专业方向课程设计 Discipline Perceive Practice	2w	1	4		
	SFT0181	创新项目实践 Innovative Project Practice	6w	3	5,6		
	SFT0191	企业项目实践 Entrepreneurial Project Practice	4w	2	6		
	SFT0201	本科毕业设计 (论文) Undergraduate Thesis	16w	6	7,8		
	SFT0211	实验室轮转 Lab Rotation	15w	3	2,3		
硕士研究生环节	650119001	硕士学位论文 (学术型) Master Thesis		10			必修

续表

课程	类别	课程代码	课程名称	学时	学分	学期	开课单位	修读要求 备注
硕士研究生环节		650139001	开题报告（硕） Literature Reading and the Report on Subject Selection		1			
		650139002	论文中期进展报告（硕） Thesis Interim Progress Report		1			
		650139003	参加校内外公开学术报告会或在学术会议上作报告（硕） Participate In Public Academic Lectures on And Off Campus or Give Presentations at Academic Conferences		1			
博士研究生环节		650219001	博士学位论文（学术型） Doctoral Dissertation		15			必修
		650239001	开题报告（博） Literature reading and the Report on Subject Selection		1			
		650239002	论文中期进展报告（博） Thesis Interim Progress Report		1			
		650239003	参加国内外学术会议并提交论文(博) Participation in International Academic Conferences		1			
		650239004	发表学术论文（博） Publish Academic Papers		1			

\* 硕博培养计划在本计划基础上根据硕博入学当年培养方案微调。

### 博士研究生过程考核要求：

博士研究生的培养实行导师负责制，组成以博士生导师为组长的博士研究生指导小组，负责博士研究生的培养和考核工作。

#### 一、研究环节要求

##### 1. 博士资格审查（第十学期末以前完成）

博士资格审查是博士生完成主要课程学习后、开展博士学位论文工作前组织的综合考核，是博士生培养过程中的重要环节。资格审查的内容包括博士生课程学习的完成情况、开题报告，学位论文的前期进展情况及其选题是否达到博士论文的水平等。通过博士资格审查后，博士生即可进入博士论文工作阶段。资格审查的具体要求另见考核实施细则。

##### 2. 文献阅读与选题报告

博士生根据自己所选定的研究方向和学位论文课题要求，一般应在第九至第十学期在导师的指导下完成文献阅读报告与选题报告且通过答辩。

博士生查阅一定量的国内外相关文献后撰写文献综述报告；根据学位论文选题，就选题的目的、意义、国内外相关研究概况、研究思路、研究内容、预期目标、研究方法、课题可行性等做出论证后撰写选题报告。

博士生的选题报告答辩会由学院各系中心统一组织，各系中心提前一周将开题时间、地点、开题人员名单报院研究生科备案。答辩专家组须由至少 3 名专家（博士生导师，其中包含一位学院学位审议会成员）组成，答辩结果为通过和不通过。

对于已通过选题，但因故更换选题的博士研究生，应在导师的安排下重新组织选题报告会，选题报告会要求同上。

博士生提交经导师签字且通过选题答辩的文献综述报告、学位论文选题报告及选题答辩材料到学院研究生科后，计 1 学分。



### 3. 参加国内外学术会议并提交论文

博士生应积极参加本学科重要的国内外学术会议并在会议上交流学术论文。会议结束后，博士生提交经导师签字的会议交流论文至学院研究生科，计 1 学分。

### 4. 论文中期进展报告（第十三学期末以前完成）

博士生的论文课题进行到中期（选题通过约一年），博士生应向其所在博士生指导小组作学位论文中期进展报告，汇报论文工作进展情况，听取质疑并商讨改进意见，提出下一阶段的计划和措施，并形成书面报告交与会者审议。

博士生提交经导师签字且通过指导小组审议的论文中期进展报告到学院研究生科，计 1 学分。

### 5. 发表学术论文

撰写和发表高水平的学术论文是博士研究生培养训练的重要内容之一，博士研究生应在导师的指导下以第一作者公开发表与学位论文有关的高水平学术论文。博士生提交经导师签字的已在期刊上公开发表的学术论文 1 篇到学院研究生科后，计 1 学分。

## 二、学位论文要求

博士学位论文是综合衡量博士生培养质量和学术水平的重要标志，应在导师指导下由博士生独立完成。博士生从事科学研究和撰写学位论文的时间不得少于两年，起始时间从开题通过的时间计算。

博士生学位论文必须有课题来源，并与导师及其所在博士学科点所承担的科研项目相结合。选题范围可以是基础研究、应用基础研究或开发研究。博士生的论文工作应以社会发展及科学技术发展中的重要理论问题、实际问题、高新技术、国家基金和重大工程技术问题为背景。要注意创造条件让博士生参加课题论证、承担和参与鉴定科研项目等方面的科研实践活动，增长才干，培养独立从事科学研究和组织科研活动的能力。

博士学位论文要坚持理论联系实际，应对我国社会主义建设、科技发展或社会发展有理论意义或应用价值，在科学或专门技术上做出创造性的成果，并表明作者具有独立从事科学研究工作的能力。博士学位论文应是系统的完整的学术论文并按《华中科技大学博士、硕士学位论文撰写规定》的要求撰写。

## 三、毕业结业及授予学位要求

完成培养计划规定的学习内容，考核合格，并通过学位论文答辩，经学院学位评定分会审议，学校审批，准予毕业；达到毕业要求，并满足机械学院博士研究生申请学位的质量标准学术成果创新性要求，经学院学位评定分会审议，报校学位评定委员会表决通过，授予博士学位；完成培养计划规定的学习内容，考核合格，并通过开题答辩，可申请结业。

## 四、其它要求

执行学校有关规定。

如果第 5 年末博士开题未过，就进行第二次分流，进入硕士学习阶段。

## 硕士研究生过程考核要求：

### 一、研究环节要求

#### 1. 文献阅读与选题报告（第十学期末以前完成）

本学科硕士生应在导师指导下，通过查阅资料，调查研究，在第十学期末（最迟在第十一期）提出文献阅读与选题报告，经所在系或科研组组织答辩通过后可进入论文工作。

硕士生提交经导师签字且通过选题答辩的文献综述报告、学位论文选题报告及选题答辩材料到学院研究生科，计 1 学分。

#### 2. 论文中期进展报告（第十二学期末以前完成）

硕士生的论文课题进行到中期（选题通过一年左右），硕士生向指导小组汇报中期进展情况

并提交学位论文中期报告，说明论文进展情况（是否按预期进行，总结已取得的成绩、遇到的问题、解决方法并提出需要改进的地方），由导师评定，主管系主任认定后，计 1 学分。

3. 参加校内外公开学术报告会或在学术会议上作报告

本学科硕士生应至少听满 6 次学术报告或者在学术会议上作报告，提交学术报告记录本或者在学术会议上作报告的材料，由导师评定，记 1 学分。

**二、学位论文要求**

硕士生用于学位论文研究的时间不得少于一年。论文选题要有学术价值或对国民经济建设有一定意义；硕士学位论文应当有创新性或新见解并按《华中科技大学博士、硕士学位论文撰写规定》的要求撰写。

**三、毕业结业及授予学位要求**

完成培养计划规定的学习内容，考核合格，并通过学位论文答辩，经学院学位评定分会审议，学校审批，准予毕业；达到毕业要求，并满足机械学院硕士研究生申请学位的质量标准学术成果创新性要求，经学院学位评定分会审议，报校学位评定委员会表决通过，授予硕士学位；完成培养计划规定的学习内容，考核合格，并通过开题答辩，可申请结业。

**四、其它要求**

执行学校有关规定。

## 未来技术学院本硕博实验班培养计划（生医方向）（本研贯通）

### Program for Bachelor-Master-PhD Experimental Class, School of Future Technology

#### 一、培养目标

##### I. Program Objectives

致力于培养德、智、体、美、劳全面发展，科学和工程基础知识扎实，在机械工程、生物医学工程、光电信息科学与工程、自动化等领域具有宽广的专业及跨专业知识，具有多学科视野和国际竞争力的拔尖创新领军人才。毕业生能在未来交叉学科技术方向持续深造，在未来社会急需的智能制造、智能感知、智能健康等技术领域引领科技和产业变革。

The program aims to cultivate tip-top internationalized talents with cross-disciplinary vision. The graduates will have solid foundation in science and engineering with both breadth and depth in fields of Mechanical Engineering, Biomedical Engineering, Optoelectronic Information Science and Engineering, or Automation. The graduates will pursue post-graduate studies at world class graduate schools in cross-disciplinary areas, and are expected to contribute to technical innovation and industrial revolution in Intelligent Manufacturing, Intellisense and Intelligent Health.

#### 二、基本规格要求

##### II. Skills profile

毕业生应达到如下要求：

1. 具有科技报国的家国情怀和使命担当，良好的品德修养，良好的科学与工程伦理素养。
2. 具有较好的人文艺术和社会科学素养，较强的社会责任感和良好的职业道德，良好的语言表达能力和人际交往能力；
3. 了解生物学和生理学知识，并具有应用数学、自然科学和工程学知识解决工程学与生物学交叉问题的能力；
4. 具有制订实验方案、进行实验、分析和解释数据的能力；
5. 具有设计一个系统、一个部件或一个过程的能力；
6. 具有对工程问题进行系统表达、建立模型、分析求解和论证的能力；
7. 具有在工程实践中运用各种技术、技能和现代工程工具的能力；
8. 具有创新意识和从事科学研究的初步能力，具有团队合作精神，在多学科工作集体中发挥作用的能力；
9. 能正确认识工程和生物医学工程对于客观世界、经济、环境和社会的影响，了解与本专业相关的法律法规，熟悉环境保护和可持续发展等方面的方针和政策；
10. 具有国际视野、终生教育的意识和继续学习的能力；
11. 至少掌握一门外语，能熟练阅读本专业外文资料，具有良好的听说能力和跨文化的交流与合作能力。

Graduates should have the following knowledge and capacity:

1. Patriotism and sense of responsibility to support national construction with science and technology strength, good moral quality, a high science and engineering ethical standard;
2. A knowledge of liberal arts and social sciences, an understanding of social, professional and

ethical responsibility, and an ability to communicate effectively in oral, written and visual forms.

3. An understanding of biology and physiology, and the capability to apply advanced mathematics, science, and engineering to solve problems at the interface of engineering and biology.

4. An ability to design and conduct experiments, to analyze and interpret data, and to report findings.

5. An ability to design a system, component, or process to meet specifications.

6. An ability to identify, formulate, analyze and solve engineering problems.

7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

8. Innovative thinking, team spirit, a preliminary ability to conduct scientific research, and an ability to function in multi-disciplinary teams.

9. An understanding about the impact of engineering and biomedical engineering solutions in a global, economic, environmental, and societal context, a knowledge of laws and regulations relevant to engineering, environmental protection and sustainable development.

10. International vision, a recognition of the need for and an ability to engage lifelong learning to remain effective in a climate of continually emerging technologies.

11. A mastery of at least one foreign language, an ability to read foreign references and conduct inter-cultural communication and cooperation.

### 三、培养特色

#### III. Program Features

指导思想：

- 宏观思维能力（系统观念、人文情怀，问题视野，领导力）
- 科学和工程素养（数理化生基础扎实，科学与工程并重）
- 多学科视野（专业能力培养，多专业方向知识，基于项目进行多学科交叉学习）
- 跨文化交流沟通能力（国际化师资，国际交流平台）

Guiding principles:

- Comprehensive thinking (Systematic consideration, humanistic feelings, problem-based view, leadership)
- Science and Engineering knowledge (A solid base of knowledge in mathematics, physics, chemistry and biology; Combination between science and engineering)
- Multidisciplinary view (Track for one major, knowledge for multiple majors, crossing learning by doing project)
- Cross-culture communication skills (Internationalized faculties, international exchange platform)

以培养工学博士为目标，衔接本科教育阶段。以未来技术创新与应用为方向，构建核心基础课程群为主体、个性化交叉课程为辅的课程体系，遵循“群体培养与多元发展相统一、工程实践与科学思维相统一”的人才培养理念，坚持多学科交叉培养、个性化、小班化、国际化、导师制的培养特色，整个本科阶段，导师指导不断线，理论学习不断线，科研实践不断线。

实施“3+1+X”的过程培养模式。前三年，按照信息大类，推行创新素质教育；第四年，自主选择交叉模块进行学习并与研究生阶段衔接。渐进式培养过程中，实行竞争分流和阶段之间有机衔接，本硕连读，并优先推荐免试攻读博士学位。

This program is the undergraduate stage of cultivating engineering doctor. The talent ability training focuses on the design and manufacture of electronic and/or optoelectronic chips and devices,

and is oriented by their applications in optical and/or electronic systems. The curriculum is based on the core courses group, supplemented by personalized and diversified courses. Talent training follows the concept of “the unity of group training and diversified development, the unity of engineering practice and scientific thinking”. This program implements a multi-disciplinary, personalized, small-class, international and mentor-led training system. Mentor guidance, theoretical study and scientific research Practice will run through the entire undergraduate stage.

The process culture mode of “3+1+X” is adopted. In the first two years, we will implement innovative quality education in accordance with the Optical and electronic information classes. In the third year, students will enter the majors of their own choice through major diversion (all the four majors of the Optical and electronic information classes can be chosen). In the fourth year, as the connecting stage of undergraduate and graduate student, in addition to continuing to study undergraduate courses according to the requirements of the training plan, you can also study some graduate courses. In the fifth year, you can begin your doctoral study. In the process of progressive training, competitive diversion and effective linkage between stages will be implemented. Students will continue to study for undergraduate and master’s degrees, and give priority to the test-free recommendation to study for a doctorate.

#### 四、主干学科

##### IV. Major Discipline

光电信息科学与工程

Optoelectronic Information Science and Engineering

集成电路与集成系统

Integrated Circuits & Integrated Systems

机器人

Robotics

人工智能

Artificial Intelligence

生物医学工程

Biomedical Engineering

#### 五、学制与学位

##### V. Program Length and Degree

学制：最低学习年限 8 年，最长学习年限 10 年。

Program Length: Four years

授予学位：工学博士

第一次分流：第 4 年完成本科环节学业可申请学士学位，第二次分流：第 5 年博士开题未通过但完成硕士学业可在第 7 年申请硕士学位。

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

##### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：203.1

Minimum Credits of Curriculum (Comprising course system and intensive practical training and internship): 203.1

完成学业最低课外学分要求：5

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Minimum Extracurricular Credits: 5

1. 课程体系学时与学分

Hours/Credits of Course System

● 博士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	572/29	14.2
	选修	160/10	3.9
学科基础课程	必修	1148/68.8	28.4
专业核心课程	必修	472/26.3	11.7
本硕衔接课程	必修	374/23	9.3
博士阶段课程	必修	164/10	4
集中性实践教学环节(本科阶段)	必修	512/16	12.7
集中性实践教学环节(博士研究生阶段)	必修	640/19	15.8
总计		4042/202.1	100
其中, 总实验(实践)学时学分		1152/35	28.5

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	572/29	14.2
	Elective	160/10	3.9
Discipline-related General Courses	Required	1148/68.8	28.4
Professional Core Curriculum	Required	472/26.3	11.7
Undergraduate Pathway Programs	Required	374/23	9.3
PhD level courses	Required	164/10	4
Internship and Practical Training (Undergraduate)	Required	512/16	12.7
Internship and Practical Training (postgraduate)	Required	640/19	15.8
Total		4042/202.1	100
Practicum Credits		1152/35	28.5

● 硕士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	572/29	15.7
	选修	160/10	4.4
学科基础课程	必修	1148/68.8	31.4
专业核心课程	必修	472/26.3	12.9
硕士阶段课程(其中本硕衔接阶段至少 12 学分)	必修	374/23	10.2
集中性实践教学环节(本科阶段)	必修	512/16	14
集中性实践教学环节(硕士研究生阶段)	必修	416/13	11.4
总计		3654/186.1	100
其中, 总实验(实践)学时学分		928/29	25.4

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	572/29	15.7
	Elective	160/10	4.4
Discipline-related General Courses	Required	1148/68.8	31.4
Professional Core Curriculum	Required	472/26.3	12.9
Undergraduate Pathway Programs	Required	374/23	10.2
Internship and Practical Training (Undergraduate)	Required	512/16	14
Internship and Practical Training (Master)	Required	416/13	11.4
Total		3654/186.1	100
Practicum Credits		928/29	25.4

## 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensified Internship and Practical Training

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	2.9
专业方向课程设计	必修	2w/1	2.9
创新项目实践	必修	6w/3	8.5
企业项目实践	必修	4w/2	5.7
毕业设计 (论文)	必修	16w/6	17.1
实验室轮转	必修	15w/3	8.6
开题报告	必修	1	2.9
论文中期进展报告	必修	1	2.9
参加国内外学术会议并提交论文	必修	1	2.9
发表学术论文	必修	1	2.9
博士学位论文	必修	15	42.7
合计	必修	35	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	2.9
Discipline Perceive Practice	Required	2w/1	2.9
Innovative Project Practice	Required	6w/3	8.5
Entrepreneurial Project Practice	Required	4w/2	5.7
Undergraduate Thesis	Required	16w/6	17.1
Lab rotation	Required	15w/3	8.6
Literature reading and the report on subject selection	Required	1	2.9
Thesis Interim Progress Report	Required	1	2.9
Participation in International academic conferences	Required	1	2.9
Publish academic papers	Required	1	2.9
Doctoral Dissertation	Required	15	42.7
Total	Required	35	100

## 3. 课外学分 (本科阶段)

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		学分
1	社会实践活动	提交社会调查报告，通过答辩者		1
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者。		2
2	思政课社会实践（必修）	提交调查报告，取得成绩		2
3	劳动教育（必修）	32 学时		2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国大学英语口语成绩	A，B，C，	3,2,1
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2

续表

序号	课外活动名称	课外活动和社会实践的要求		学分
5	竞赛	全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文、专利	根据论文水平	每篇论文	2-5
		发明专利授权	每项前两名	2
		实用新型、软件著作权	每项前两名	1
7	参加科研和创新设计活动	参与科研项目时间与科研能力；纳入创新计划；提交结题报告、导师审查评分、学院审核。		1-3

说明：参加校级体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六名至第八名者与校级三等奖等同。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		1
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group that is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and Political Course Social Practice	Submit a report and obtain a passing score		2
3	Public Service Work	(Labor education) (required 32 Hours/2 Credits)		3
2	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CET Oral Examination	A、B、C	3,2,1
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
3	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
4	Research articles	National Journals	Per piece	2
		SCI Journals	Per piece	4
5	Scientific Research and Extracurricular Activity	Depending on time and quality of the research; Selected by the innovation scheme; Submit report, scored by supervisors, evaluated by the School		1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level

## 七、教学进程计划表

### VII. Course Schedule

院（系）：未来技术学院  
School: School of Future Technology

专业：依据专业方向  
Major: Major Dependent



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课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Ethics and Rule of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Theory of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0013	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	PHE0002	大学体育（一） Physical Education (I)	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education (II)	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education (III)	24	1			5-6
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	选修 Elective		从不同的课程模块中修读若干课程，总学分不低于10学分，其中美育教育类课程、《大学生心理健康》均不低于2学分 General Education Courses (aesthetic education 2 credits at minimum)	160	10			2-8
	必修 Required	SFL0003	综合英语（一） Comprehensive English (I)	48	3			1
	必修 Required	SFL0013	综合英语（二） Comprehensive English (II)	48	3			2
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0552	微积分（A）上 Calculus (I)	96	6			1
	必修 Required	MAT0532	微积分（A）下 Calculus (II)	96	6			2
	必修 Required	MAT0722	线性代数（A） Linear Algebra	48	3			1
	必修 Required	MAT0592	概率论与数理统计（A） Probability and Mathematics Statistics	48	3			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics Special Functions	40	2.5			4
	必修 Required	PHY0511	大学物理（一） Physics (I)	64	4			2

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	PHY0521	大学物理 (二) Physics (II)	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments ( II )	24	0.8	24		3
	必修 Required	MESE0891	工程制图 (一) Engineering Graphics ( I )	40	2.5			1
	必修 Required	QMX0011	科学思维与研究方法 (新生研讨课) Method of Scientific Thinking and Research	16	1			1
	必修 Required	SFT0001	普通化学 General Chemistry	64	3.5	16		2
	必修 Required	SFT0091	基础生命科学 Fundamental Life Science ( I )	32	2			4
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	SFT0031	数据结构与算法设计 Data Structure and Algorithm Design	60	3		24	3
	必修 Required	SFT0021	科技阅读与写作 Academic Reading and Writing	32	2			3
	必修 Required	OEI5801	人工智能导论 Foundation of Artificial Intelligence	32	2			4
	必修 Required	SFT0041	单片机与嵌入式系统 Microcontroller & Embedded System	72	4.5	8		5
	必修 Required	EIC2131	线性电路理论与实验 Circuit Theory and experiments	72	4.5	16		4
	必修 Required	SFT0061	电子器件与电路 Electronic Devices and Circuits	72	4.5	16		5
	必修 Required	OEI0581	信号与线性系统 Signals and Linear Systems	56	3.5		4	4
专业核心课程 Major-Specific Core Courses	必修 Required	SFT0141	光学原理 Principles of Optics	72	4	16		6
	必修 Required	BI02081	解剖与生理学 Anatomy and Physiology	64	4			5
	必修 Required	BI02091	解剖与生理学实验 Experiments in Anatomy and Physiology	32	1	32		5
	必修 Required	ENS2021	生物医学数字信号处理 Biomedical Digital Signal Processing	48	3			6
	必修 Required	SFT0101	基础生命科学 (二) Fundamental Life Science ( II )	48	2.5	16		5
	必修 Required	SFT0121	模式识别与机器学习 Pattern Recognition & Machine Learning	48	3			5
	必修 Required	SFT0131	最优化理论与方法 Optimization Theory & Methods	48	3			6

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
Major-Specific Core Courses	必修 Required	BI02291	生物医学数字信号处理实验 Experiments in Biomedical Digital Signal Processing	16	0.5		16	6
	必修 Required	BI02261	生物医学传感检测与仪器 Biomedical Sensor, Testing and Instrumentation	40	2.5			6
	必修 Required	BI02271	生物医学传感检测与仪器实验 Experiments in Biomedical Sensing, Testing and Instrumentation	24	0.8	24		6
	必修 Required	ENS2031	定量生理学 Quantitative Physiology as a Basis for Bioengineering	32	2	8		5
硕士阶段课程 (校级公共课)		选课说明	校级公共课可以选在 7-10 学期完成。					
	必修 Required	408110001	自然辩证法概论	18	1			7-10
	必修 Required	408130001	新时代中国特色社会主义理论与实践研究	36	2			7-10
	必修 Required	411130003	第一外国语 (英语一)	32	2			7-10
本硕博衔接课程 (一级基础课)		选课说明	要求第 7, 8 学期, 一级基础课、二级基础课至少各选修 2 门, 一级基础课最少 5 个学分。					
	必修 Required	170132001	学术规范与论文写作 (生命学院)	16	1			7
	限选							
	选修 Elective	170111044	现代分子生物学	32	2			7
	选修 Elective	170111045	现代细胞生物学	32	2			7
	选修 Elective	AUT2101	计算机视觉	32	2			7
	选修 Elective	184111035	现代最优化理论与方法	32	2			7
	选修 Elective	170111046	生物医学统计学	16	1			7
本硕博衔接课程 (二级基础课)	选修 Elective	170111035	现代医学图像处理	32	3			7
	选修 Elective	170111037	医学影像学	32	2			7
	选修 Elective	170111039	组织光学	32	2			7
	选修 Elective	1701310007	生物医学工程进展	32	2			7
	选修 Elective	170111029	生物信息学	32	2			7
	选修 Elective	170111038	组织工程与人工器官	32	2			7

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
本硕博衔接课程(数学课)		选课说明	数学课限选一门					
	选修 Elective	11110001	矩阵论	48	3			7
	选修 Elective	11110005	随机过程	48	3			7
	选修 Elective	11110002	数值分析	48	3			8
	选修 Elective	11110004	数理统计	48	3			7
硕 士 选 修 课		选课说明	第 9, 10 学期, 要求专业选修课 2 门, 跨一级学科 1 门(从学院其他方向中任选 1 门)。					
	选修 Elective	170111022	嵌入式医学仪器系统设计	32	2			9
	选修 Elective	170111028	生物信息获取技术	32	2			9
	选修 Elective	170111036	医学动物模型方法学	32	2			9
	选修 Elective	170111003	神经光学成像	32	2			9
	选修 Elective	170131010	生物医学成像与电子学实验	48	3			9
	选修 Elective	170111042	医疗器械监管科学	32	2			9
跨学科课程	必修 Required		从学院其他方向中任选 1 门	32	2			9-10
								12
(校级公共课)			第五年末完成博士开题后, 进入博士阶段课程学习					
	必修 Required	408210001	中国马克思主义与当代 Chinese Marxism	36	2			11
	必修 Required	411210001	英语论文写作 English Academic Writing	32	2			11
跨学科课程	必修 Required		可以选其他校级公选课或者其他方向的研究生专业课	32	2			11-12
博 士 专 修 课			第六年要求学习 2 门博士专修课程					
	选修 Elective	170231006	现代生物医学仪器	32	2			11
	选修 Elective	170231002	分子影像学	32	2			11
	选修 Elective	170231004	光学分子成像	32	2			11
	选修 Elective	170211001	生命科学与技术进展	32	2			11

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
本科实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	SFT0171	专业方向课程设计 Discipline Perceive Practice	2w	1			4
	必修 Required	SFT0181	创新项目实践 Innovative Project Practice	6w	3			5, 6
	必修 Required	SFT0191	企业项目实践 Entrepreneurial Project Practice	4w	2			6
	必修 Required	SFT0201	本科毕业设计（论文） Undergraduate Thesis	16w	6			7, 8
	必修 Required	SFT0211	实验室轮转 Lab Rotation	15w	3			2, 3
硕士研究生实践环节	必修 Required	650119001	开题报告 Literature Reading and the Report on Subject Selection		1			10
	必修 Required	650139001	论文中期进展报告 Thesis Interim Progress Report		1			12
	必修 Required	650139002	参加校内外公开学术报告会或在学术会议上作报告 Participate in Public Academic Lectures on and Off Campus or Give Presentations at Academic Conferences		1			9-14
	必修 Required	650139003	学位论文 Master Thesis		10			14
博士研究生实践环节	必修 Required	650219001	博士学位论文（学术型） Doctoral Dissertation		15			16
	必修 Required	650239001	开题报告（博） Literature Reading and the Report on Subject Selection		1			10
	必修 Required	650239002	论文中期进展报告 Thesis Interim Progress Report		1			12
	必修 Required	650239003	参加国内外学术会议并提交论文(博) Participation in International Academic Conferences		1			11-15
	必修 Required	650239004	发表学术论文（博） Publish Academic Papers		1			11-15

### 博士研究生过程考核要求：

博士研究生的培养实行导师负责制，组成以博士生导师为组长的博士研究生指导小组，负责博士研究生的培养和考核工作。

#### 一、过程管理

1. 博士资格审查（第十学期末以前完成）：是博士生完成主要课程学习后、开展博士学位论文工作前组织的综合考核，是博士生培养过程中的重要环节。资格审查的内容包括博士生课程学习的完成情况、开题报告，学位论文的前期进展情况及其选题是否达到博士论文的水平等。通过博士资格审查后，博士生即可进入博士论文工作阶段。资格审查的具体要求另见考核实施细则。

开题报告应包括的内容为：

- (1) 课题的来源、意义；
- (2) 课题的国内外研究概况及发展趋势；
- (3) 课题的研究内容和技术方案；
- (4) 理论与实践方面预计的创造性成果；
- (5) 主要参考文献。

2. 中期考核（第十三学期末以前完成）：考核内容包含课程学习的完成情况、论文中期进展报告和思想品德三个方面。考核合格的博士生，继续按博士生培养。考核的具体要求另见考核实施细则。

论文中期进展报告是博士生撰写博士学位论文前，要向博士生指导小组或有关学者、专家报告研究工作成果，听取质疑与商讨改进意见，待创造性研究成果获得认同后，方可撰写论文。报告应包含内容：

- (1) 开题后论文工作进展情况；
- (2) 前期取得的成果；
- (3) 下一阶段的计划和改进措施。

#### 3. 参加国内外学术会议并提交论文

博士生在校期间必须积极、主动参加校内外本学科、本专业或其他相关专业的各种学术活动，并达到规定次数。且至少参加一次由国内一级学会组织的全国性会议或者国际会议，并提交论文被接收。

#### 4. 博士研究生申请论文答辩

博士生完成学位论文初稿后，经导师审核认为论文符合要求的，由导师组织有关专家，对学位论文进行预答辩。博士学位论文预答辩应在博士学位论文评审之前完成，预答辩通过后，博士生方可上传评审论文。

博士研究生申请论文答辩的基本条件：

- (1) 修完所规定的课程学分；
- (2) 完成研究环节中开题报告、论文中期进展报告和参加国内外学术会议并提交论文等的学分；
- (3) 博士毕业的学术条件：发表期刊论文一篇。
- (4) 完成博士论文的撰写；
- (5) 通过校内外专家的预答辩和评审。

### 二、学位论文要求

1. 博士论文选题范围可以是基础研究、应用基础研究或开发研究。博士生的论文工作应以社会发展及科学技术发展中的重要理论问题、实际问题、高新技术、国家基金和重大工程技术问题为背景。

2. 博士学位论文内容应体现学位申请人在光学工程学科掌握坚实的基础理论和系统的专门知识，并在专门研究方向有系统、深入的专业知识和能力，具有独立从事科学研究工作的能力。论文应体现作者本人创造性思维，创新成果重点在学术创新。

3. 博士生可以以学术期刊论文、学术会议论文、专利、科研奖励、科技报告等多种形式（以下统称相关学术成果）展现其创造性成果。相关学术成果可以作为评价学位论文水平的重要参考。

4. 博士学位论文应是一篇系统、完整的学术文章，内容结构完整、逻辑清晰、论述有据、数据真实、语句通顺，工作量饱满，满足学校学位论文的撰写要求。

### 三、毕业结业及授予学位要求

1. 研究生在规定的学习年限内，完成培养方案规定内容，考核合格，且学位论文答辩通过，院(系)学位审议委员会或党政联席会审核，学校审批，准予毕业并发给毕业证书。

达到学位授予条件的，可按程序申请学位。未达到学位授予条件的，毕业后一年内若达到学

位授予条件，可按程序申请学位。

毕业后申请学位仅限一次。

2. 研究生在校学习已满基本学习年限且在最长学习年限内，未达到毕业要求但符合结业要求的。可申请结业。

具体要求参照学校有关文件执行。

**四、其余培养要求按照《华中科技大学博士研究生培养工作规定》执行。**

如果第 5 年末博士开题未过，就进行第二次分流，进入硕士学习阶段。

**硕士研究生过程考核要求：**

### **一、研究环节要求**

#### **1. 开题报告**

考核以书面报告和口头报告方式。通过考核可正式进入硕士论文工作。具体审核要求另见考核实施细则。开题报告应包含下列内容：

- (1) 课题的来源、意义；
- (2) 课题的国内外研究概况及发展趋势；
- (3) 课题的研究内容和技术方案；
- (4) 理论与实践方面预计的预期成果；
- (5) 主要参考文献。

#### **2. 论文中期进展报告**

中期考核在第十二学期末完成，考核以书面报告和口头报告方式。具体审核要求另见考核实施细则。

论文中期进展报告应包含下列内容：

- (1) 开题后论文工作进展情况；
- (2) 取得的成果；
- (3) 下一阶段的计划和措施。

#### **3. 参加校内外公开学术报告会或在学术会议上作报告**

在校期间必须积极、主动参加校内外本学科、本专业或其他相关专业的各种学术活动，并达到规定次数；或在学术会议上做报告。

### **二、学位论文要求**

1. 硕士生用于申请硕士学位的创新成果，应当由申请学位的硕士生在读期间独立完成，并以学位论文的形式完整呈现。论文选题应属于本学科专业相关研究方向的基础研究或应用研究课题，有较大的理论意义或应用价值，对学科发展或国家需求有重要学术意义或应用价值。学位论文是进行学位评定的主要依据；

2. 硕士生可以以学术期刊论文、学术会议论文、专著、专利、软件著作权、报告等多种形式（以下统称相关学术成果）展现其创新成果。相关学术成果可以作为评价学位论文水平的重要参考；

3. 论文内容应体现学位申请人在电子科学与技术学科掌握坚实的基础理论和系统的专门知识，且具有从事科学研究工作或独立担负专门技术工作的能力。论文应体现作者本人创造性思维，申请学术型硕士学位的创新成果重点在学术创新；

4. 论文应具有系统性和完整性，表达清楚，论证严谨，引文准确、全面，行文规范。

### **三、毕业结业及授予学位要求**

1. 研究生在规定的学习年限内，完成培养方案规定内容，考核合格，且学位论文答辩通过，经院（系）学位审议委员会或党政联席会审核，学校审批，准予毕业并发给毕业证书。

达到学位授予条件的，可按程序申请学位。未达到学位授予条件的，毕业后一年内若达到学

位授予条件，可按程序申请学位。

毕业后申请学位仅限一次。

2. 研究生在校学习已满基本学习年限且在最长学习年限内，未达到毕业要求但符合结业要求的，可申请结业。

具体要求参照学校有关文件执行。

#### **四、其它要求**

其余培养要求按照《华中科技大学硕士研究生培养工作规定》执行。



## 未来技术学院本硕博实验班培养计划（光电方向）（本研贯通）

### Program for Bachelor-Master-PhD Experimental Class, School of Future Technology

#### 一、培养目标

##### I. Program Objectives

致力于培养德、智、体、美、劳全面发展，科学和工程基础知识扎实，在机械工程、生物医学工程、光电信息科学与工程、自动化等领域具有宽广的专业及跨专业知识，具有多学科视野和国际竞争力的拔尖创新领军人才。毕业生能在未来交叉学科技术方向持续深造，在未来社会急需的智能制造、智能感知、智能健康等技术领域引领科技和产业变革。

The program aims to cultivate tip-top internationalized talents with cross-disciplinary vision. The graduates will have solid foundation in science and engineering with both breadth and depth in fields of Mechanical Engineering, Biomedical Engineering, Optoelectronic Information Science and Engineering, or Automation. The graduates will pursue post-graduate studies at world class graduate schools in cross-disciplinary areas, and are expected to contribute to technical innovation and industrial revolution in Intelligent Manufacturing, Intellisense and Intelligent Health.

#### 二、基本规格要求

##### II. Skills profile

毕业生应达到如下要求：

1. 具有科技报国的家国情怀和使命担当，良好的品德修养，良好的科学与工程伦理素养。
2. 具有较好的人文艺术和社会科学素养，较强的社会责任感和良好的职业道德，良好的语言表达能力和人际交往能力；
3. 了解生物学和生理学知识，并具有应用数学、自然科学和工程学知识解决工程学与生物学交叉问题的能力；
4. 具有制订实验方案、进行实验、分析和解释数据的能力；
5. 具有设计一个系统、一个部件或一个过程的能力；
6. 具有对工程问题进行系统表达、建立模型、分析求解和论证的能力；
7. 具有在工程实践中运用各种技术、技能和现代工程工具的能力；
8. 具有创新意识和从事科学研究的初步能力，具有团队合作精神，在多学科工作集体中发挥作用的能力；
9. 能正确认识工程和光电信息工程对于客观世界、经济、环境和社会的影响，了解与本专业相关的法律法规，熟悉环境保护和可持续发展等方面的方针和政策；
10. 具有国际视野、终生教育的意识和继续学习的能力；
11. 至少掌握一门外语，能熟练阅读本专业外文资料，具有良好的听说能力和跨文化的交流和合作能力。

Graduates should have the following knowledge and capacity:

1. Patriotism and sense of responsibility to support national construction with science and technology strength, good moral quality, a high science and engineering ethical standard;
2. A knowledge of liberal arts and social sciences, an understanding of social, professional and

ethical responsibility, and an ability to communicate effectively in oral, written and visual forms.

3. An understanding of biology and physiology, and the capability to apply advanced mathematics, science, and engineering to solve problems at the interface of engineering and biology.

4. An ability to design and conduct experiments, to analyze and interpret data, and to report findings.

5. An ability to design a system, component, or process to meet specifications.

6. An ability to identify, formulate, analyze and solve engineering problems.

7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

8. Innovative thinking, team spirit, a preliminary ability to conduct scientific research, and an ability to function in multi-disciplinary teams.

9. An understanding about the impact of engineering and biomedical engineering solutions in a global, economic, environmental, and societal context, a knowledge of laws and regulations relevant to engineering, environmental protection and sustainable development.

10. International vision, a recognition of the need for and an ability to engage lifelong learning to remain effective in a climate of continually emerging technologies.

11. A mastery of at least one foreign language, an ability to read foreign references and conduct inter-cultural communication and cooperation.

### 三、培养特色

#### III. Program Features

指导思想：

- 宏观思维能力（系统观念、人文情怀，问题视野，领导力）
- 科学和工程素养（数理化生基础扎实，科学与工程并重）
- 多学科视野（专业能力培养，多专业方向知识，基于项目进行多学科交叉学习）
- 跨文化交流沟通能力（国际化师资，国际交流平台）

Guiding principles:

- Comprehensive thinking (Systematic consideration, humanistic feelings, problem-based view, leadership)
- Science and Engineering knowledge (A solid base of knowledge in mathematics, physics, chemistry and biology; Combination between science and engineering)
- Multidisciplinary view (Track for one major, knowledge for multiple majors, crossing learning by doing project)
- Cross-culture communication skills (Internationalized faculties, international exchange platform)

以培养工学博士为目标，衔接本科教育阶段。以未来技术创新与应用为方向，构建核心基础课程群为主体、个性化交叉课程为辅的课程体系，遵行“群体培养与多元发展相统一、工程实践与科学思维相统一”的人才培养理念，坚持多学科交叉培养、个性化、小班化、国际化、导师制的培养特色，整个本科阶段，导师指导不断线，理论学习不断线，科研实践不断线。

实施“3+1+X”的过程培养模式。前三年，按照信息大类，推行创新素质教育；第四年，自主选择交叉模块进行学习并与研究生阶段衔接。渐进式培养过程中，实行竞争分流和阶段之间有机衔接，本硕连读，并优先推荐免试攻读博士学位。

This program is the undergraduate stage of cultivating engineering doctor. The talent ability training focuses on the design and manufacture of electronic and/or optoelectronic chips and devices,

and is oriented by their applications in optical and/or electronic systems. The curriculum is based on the core courses group, supplemented by personalized and diversified courses. Talent training follows the concept of “the unity of group training and diversified development, the unity of engineering practice and scientific thinking”. This program implements a multi-disciplinary, personalized, small-class, international and mentor-led training system. Mentor guidance, theoretical study and scientific research Practice will run through the entire undergraduate stage.

The process culture mode of “3+1+X” is adopted. In the first two years, we will implement innovative quality education in accordance with the Optical and electronic information classes. In the third year, students will enter the majors of their own choice through major diversion (all the four majors of the Optical and electronic information classes can be chosen). In the fourth year, as the connecting stage of undergraduate and graduate student, in addition to continuing to study undergraduate courses according to the requirements of the training plan, you can also study some graduate courses. In the fifth year, you can begin your doctoral study. In the process of progressive training, competitive diversion and effective linkage between stages will be implemented. Students will continue to study for undergraduate and master’s degrees, and give priority to the test-free recommendation to study for a doctorate.

#### 四、主干学科

##### IV. Major Discipline

光电信息科学与工程

Optoelectronic Information Science and Engineering

集成电路与集成系统

Integrated Circuits & Integrated Systems

机器人

Robotics

人工智能

Artificial Intelligence

生物医学工程

Biomedical Engineering

#### 五、学制与学位

##### V. Program Length and Degree

学制：最低学习年限 8 年，最长学习年限 10 年。

Program Length: Four years

授予学位：工学博士

第一次分流：第 4 年完成本科环节学业可申请学士学位，第二次分流：第 5 年博士开题未通过但完成硕士学业可在第 7 年申请硕士学位。

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

##### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：202.8

Minimum Credits of Curriculum (Comprising course system and intensive practical training and internship): 202.8

完成学业最低课外学分要求：5

Minimum Extracurricular Credits: 5

## 1. 课程体系学时与学分

Hours/Credits of Course System

## ● 博士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	572/29	14
	选修	160/10	4
学科基础课程	必修	1164/68.8	29
专业核心课程	必修	440/26	11
本硕衔接课程	必修	374/23	9.3
博士阶段课程	必修	164/10	4.1
集中性实践教学环节(本科阶段)	必修	512/16	12.7
集中性实践教学环节(博士研究生阶段)	必修	640/19	15.9
总计		4026/201.8	100
其中, 总实验(实践)学时学分		1152/35	28.6

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	572/29	14
	Elective	160/10	4
Discipline-related General Courses	Required	1164/68.8	29
Professional Core Curriculum	Required	440/26	11
Undergraduate Pathway Programs	Required	374/23	9.3
PhD level courses	Required	164/10	4.1
Internship and Practical Training( Undergraduate)	Required	512/16	12.7
Internship and Practical Training( postgraduate)	Required	640/19	15.9
Total		4026/201.8	100
Practicum Credits		1152/35	28.6

## ● 硕士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	572/29	15.1
	选修	160/10	4.4
学科基础课程	必修	1164/68.8	32.1
专业核心课程	必修	440/26	12.1
硕士阶段课程(其中本硕衔接阶段至少 12 学分)	必修	374/23	10.3
集中性实践教学环节(本科阶段)	必修	512/16	14.1
集中性实践教学环节(硕士研究生阶段)	必修	416/13	11.5
总计		3638/185.8	100
其中, 总实验(实践)学时学分		928/29	25.6

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	572/29	15.1
	Elective	160/10	4.4
Discipline-related General Courses	Required	1164/68.8	32.1
Professional Core Curriculum	Required	440/26	12.1
Undergraduate Pathway Programs	Required	374/23	10.3
Internship and Practical Training (Undergraduate)	Required	512/16	14.1
Internship and Practical Training (Master)	Required	416/13	11.5
Total		3638/185.8	100
Practicum Credits		928/29	25.6

## 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensified Internship and Practical Training

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	2.9
专业方向课程设计	必修	2w/1	2.9
创新项目实践	必修	6w/3	8.5
企业项目实践	必修	4w/2	5.7
毕业设计(论文)	必修	16w/6	17.1
实验室轮转	必修	15w/3	8.6
开题报告	必修	1	2.9
论文中期进展报告	必修	1	2.9
参加国内外学术会议并提交论文	必修	1	2.9
发表学术论文	必修	1	2.9
博士学位论文	必修	15	42.7
合计	必修	35	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	2.9
Discipline Perceive Practice	Required	2w/1	2.9
Innovative Project Practice	Required	6w/3	8.5
Entrepreneurial Project Practice	Required	4w/2	5.7
Undergraduate Thesis	Required	16w/6	17.1
Lab rotation	Required	15w/3	8.6
Literature reading and the report on subject selection	Required	1	2.9
Thesis Interim Progress Report	Required	1	2.9
Participation in International academic conferences	Required	1	2.9
Publish academic papers	Required	1	2.9
Doctoral Dissertation	Required	15	42.7
Total	Required	35	100

## 3. 课外学分(本科阶段)

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		学分
1	社会实践活动	提交社会调查报告，通过答辩者		1
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者。		2
2	思政课社会实践（必修）	提交调查报告，取得成绩		2
3	劳动教育（必修）	32 学时		2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达 90 分以上者	3
		雅思考试	达 6.5 分以上者	3
		GRE 考试	达 325 分以上者	3
		全国大学英语口语成绩	A，B，C，	3,2,1
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
			获系统分析员证书者	4
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1

续表

序号	课外活动名称	课外活动和社会实践的要求		学分
5	竞赛	省级	获一等奖者	4
			获二等奖者	3
			获三等奖者	2
		全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文、专利	根据论文水平	每篇论文	2-5
		发明专利授权	每项前两名	2
		实用新型、软件著作权	每项前两名	1
7	参加科研和创新设计活动	参与科研项目时间与科研能力；纳入创新计划；提交结题报告、导师审查评分、学院审核。		1-3

说明：参加校级体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六名至第八名者与校级三等奖等同。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		1
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group that is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and Political Course Social Practice	Submit a report and obtain a passing score		2
3	Public Service Work	(Labor education) (required 32 Hours/2 Credits)		3
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CET Oral Examination	A、B、C	3,2,1
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
			Win certificate of System Analyst	4
5	Competitions	University Level	Win first prize	3
			Win second prize	2
			Win third prize	1
		Provincial Level	Win first prize	4
			Win second prize	3
			Win third prize	2
		National Level	Win first prize	6
			Win second prize	4
			Win third prize	3
6	Research articles	National Journals	Per piece	2
		SCI Journals	Per piece	4
7	Scientific Research and Extracurricular Activity	Depending on time and quality of the research; Selected by the innovation scheme; Submit report, scored by supervisors, evaluated by the School		1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level

## 七、教学进程计划表

## VII. Course Schedule

院（系）：未来技术学院

专业：依据专业方向

School: School of Future Technology

Major: Major Dependent

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Ethics and Rule of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Theory of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	选修 Elective		从不同的课程模块中修读若干课程，总学分不低于 10 学分，其中美育教育类课程、《大学生心理健康》均不低于 2 学分 General Education Courses (aesthetic education 2 credits at minimum)	160	10			2-8
	必修 Required	SFL0003	综合英语（一） Comprehensive English ( I )	48	3			1
	必修 Required	SFL0013	综合英语（二） Comprehensive English ( II )	48	3			2
学科基础课程 Discipline-related General Courses	必修 Required	MAT0552	微积分（A）上 Calculus ( I )	96	6			1
	必修 Required	MAT0532	微积分（A）下 Calculus ( II )	96	6			2
	必修 Required	MAT0722	线性代数（A） Linear Algebra	48	3			1
	必修 Required	MAT0592	概率论与数理统计（A） Probability and Mathematics Statistics	48	3			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
学科基础课程 Discipline-Related General Courses	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics Special Functions	40	2.5			4
	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics (II )	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments (II)	24	0.8	24		3
	必修 Required	MESE0891	工程制图 (一) Engineering Graphics ( I )	40	2.5			1
	必修 Required	QMX0011	科学思维与研究方法 (新生研讨课) Method of Scientific Thinking and Research	16	1			1
	必修 Required	SFT0001	普通化学 General Chemistry	64	3.5	16		2
	必修 Required	SFT0091	基础生命科学 (一) Fundamental Life Sciences ( I )	32	2			4
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	SFT0031	数据结构与算法设计 Data Structure and Algorithm Design	48	3		24	3
	必修 Required	SFT0021	科技阅读与写作 Academic Reading and Writing	32	2			3
	必修 Required	OEI5801	人工智能导论 Foundation of Artificial Intelligence	32	2			4
	必修 Required	SFT0041	单片机与嵌入式系统 Microcontroller & Embedded System	72	4.5	8		5
	必修 Required	EIC2131	线性电路理论与实验 Circuit Theory and experiments	72	4.5	16		4
	必修 Required	SFT0061	电子器件与电路 Electronic Devices and Circuits	72	4.5	16		5
	必修 Required	OEI0581	信号与线性系统 Signals and Linear Systems	56	3.5		4	4
专业核心课程 Major-Specific Core Courses	必修 Required	SFT0051	理论力学 Theoretical Mechanics	32	2			4
	必修 Required	SFT0071	电动力学 Electronical Mechanics	32	2			4
	必修 Required	SFT0081	量子力学 Quantum Mechanics	32	2			5
	必修 Required	SFT0111	热力学与统计力学 Thermodynamics and Statistical Mechanics	32	2			5



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
Major-Specific Core Courses 专业核心课程	必修 Required	SFT0121	模式识别与机器学习 Pattern Recognition & Machine Learning	48	3			5
	必修 Required	SFT0131	最优化理论与方法 Optimization Theory and Methods	48	3			6
	必修 Required	SFT0141	光学原理 Principles of Optics	72	4	16		6
	必修 Required	SFT0151	光电探测与信号处理 Optoelectronic Detection and Signal Processing	72	4	16		6
	必修 Required	SFT0161	激光原理与技术 Laser and Photonics	72	4	16		6
(校级公共课) 硕上阶段课程		选课说明	校级公共课可以选在 7-10 学期完成。					
	必修 Required	408110001	自然辩证法概论	18	1			7-10
	必修 Required	408130001	新时代中国特色社会主义理论与实践研究	36	2			7-10
	必修 Required	411130003	第一外国语（英语一）	32	2			7-10
本硕博衔接课程（一级基础课）		选课说明	要求第 7，8 学期，一级基础课、二级基础课至少各选修 2 门					
	必修 Required	182131001	学术规范与论文写作（光电学院） Thesis Writing	16	1			8
	限选							
	选修 Elective	182131063	计算电磁学 Computational Electromagnetics	48	3			7
	选修 Elective	182131028	光波导技术 Optical Waveguide Technologies	48	3			7
	选修 Elective	182131003	激光光学 Laser Optics	48	3			7
	选修 Elective	182131006	光子学与光电子学 Photonics and Optoelectronics	48	3			7
	选修 Elective	182111009	光电器件物理基础 Physical Fundamentals of Optoelectronic Devices	32	2			7
	选修 Elective	182111010	光电器件化学基础 Chemical Fundamentals of Optoelectronic Devices	32	2			7
	选修 Elective	182111008	光电测试方法 Optoelectronic Test and Measurement Methods	32	2			8
	选修 Elective	182131015	非线性光学（光电学院） Nonlinear Optics	48	3			8
	选修 Elective	182131004	光电成像原理与技术 Principle and Technology of Photoelectric Imaging	32	2			8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
	选修 Elective	182131007	现代实用光学系统 Modern Practical Optical System	32	2			8
	选修 Elective	182131010	现代激光物理与技术 Modern laser physics and technology	48	3			8
本硕衔接课程(二级基础课)	选修 Elective	182111005	相干光通信技术 Coherent Optical Communication Technology	48	3			7
	选修 Elective	182111011	平面光学 Planar Optics	32	2			7
	选修 Elective	182131030	MEMS 设计与集成技术 MEMS Design and Integration Technology	32	2			7
	选修 Elective	182111012	信息光电子器件 Information Optoelectronic Devices	48	3			7
	选修 Elective	182131033	硅基光子学 Silicon Photonics	32	2			7
	选修 Elective	182111002	光电信号处理 Optoelectronic Signal Processing	48	3			7
	选修 Elective	182131032	光谱学技术 Optical Spectroscopic Techniques	32	2			8
	选修 Elective	182131029	先进光纤通信系统 Advanced Optical Fiber Communication system	32	2			8
	选修 Elective	182111019	储能原理与技术 Principle and Technology of Energy Storage	32	2			8
	选修 Elective	182111022	太阳能电池 Solar Cells	32	2			8
本硕衔接课程(数学课)		选课说明	数学课限选一门					
	选修 Elective	11110001	矩阵论	48	3			7
	选修 Elective	11110005	随机过程	48	3			7
	选修 Elective	11110002	数值分析	48	3			8
	选修 Elective	11110004	数理统计	48	3			7
硕士选修课		选课说明	第 9, 10 学期, 要求专业选修课 2 门, 跨一级学科 1 门(从学院其他方向中任选 1 门)。					
	选修 Elective	182131067	光交换技术与系统应用 Optics Switching Technology and System Application	32	2			9
	选修 Elective	182131044	飞秒激光光学 Femtosecond laser optics	32	2			9
	选修 Elective	182111004	微纳制造与光电分析技术 Micro / Nano Manufacturing and Optoelectronic Analysis Technology	32	2			9

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
硕士选修课	选修 Elective	182131038	宽带光接入网 Broadband Optical Access Network	32	2			9
	选修 Elective	182131039	机器视觉技术 Machine Vision	32	2			9
	选修 Elective	182131045	晶体材料物理 Crystal Materials Physics	32	2			9
	选修 Elective	182111018	先进传感技术 Advanced Sensing Technology	32	2			9
	选修 Elective	182131056	光纤传感精密测量技术与应用 Optical Fiber Sensing Technology for Precision Measurement and Applications	32	2			9
	选修 Elective	182131060	纳米压印光电子学 Nano-imprint lithography optoelectronics	32	2			9
	选修 Elective	182111020	零碳燃料制备与利用 Zero-Carbon Fuels : Synthesis and Consumption	32	2			9
	选修 Elective	182111021	光电节能技术 Optoelectronic Technology for Energy Saving	32	2			9
	选修 Elective	182131046	空间激光通信原理和技术 Principles and Technologies of Free Space Optical Communication	32	2			10
	选修 Elective	182131050	半导体激光器及其应用 Semiconductor Lasers and Their Applications	32	2			10
	选修 Elective	182131054	激光材料加工技术与设备 Laser Materials Processing: Principle, Apparatus and its Applications	32	2			10
	选修 Elective	182131057	光纤通信器件原理与设计 The Principle and Design of Devices for Optical Communication	32	2			10
跨学科课程	必修 Required		从学院其他方向中任选 1 门	32	2			9-10
博士阶段课程 (校级公共课)			第五年末完成博士开题后, 进入博士阶段课程学习					
	必修 Required	408210001	中国马克思主义与当代 Chinese Marxism	36	2			11
	必修 Required	411210001	英语论文写作 English Academic Writing	32	2			11
跨学科课程	必修 Required		可以选其他校级公选课或者其他方向的研究生专业课	32	2			11-12
博士专修课			第六年要求学习 2 门博士专修课程					
	选修 Elective	182211005	博士生专题讲座 Seminar Course for PhD Students	32	2			12
	选修 Elective	182231004	宽禁带半导体材料与器件 Wide Bandgap Semiconductor Materials and Devices	32	2			12

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
博士选修课	选修 Elective	182211004	能源光电材料与器件 Energy Optoelectronic Materials and Devices	32	2			12
	选修 Elective	182231006	特种光纤与器件技术 Specialty Optical Fibers and Device Technologies	32	2			12
	选修 Elective	182231007	全固态激光器原理与技术 All-solid-state Lasers: Fundamentals and Technology	32	2			11
本科实践环节 Practical Training Items	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	SFT0171	专业方向课程设计 Discipline Perceive Practice	2w	1			4
	必修 Required	SFT0181	创新项目实践 Innovative Project Practice	6w	3			5, 6
	必修 Required	SFT0191	企业项目实践 Entrepreneurial Project Practice	4w	2			6
	必修 Required	SFT0201	本科毕业设计（论文） Undergraduate Thesis	16w	6			7, 8
	必修 Required	SFT0211	实验室轮转 Lab Rotation	15w	3			2, 3
硕士研究生实践环节	必修 Required	650119001	开题报告 Literature Reading and The Report on Subject Selection		1			10
	必修 Required	650139001	论文中期进展报告 Thesis Interim Progress Report		1			12
	必修 Required	650139002	参加校内外公开学术报告会或在学术会议上作报告 Participate in Public Academic Lectures on And Off Campus or Give Presentations at Academic Conferences		1			9-14
	必修 Required	650139003	学位论文 Master Thesis		10			14
博士研究生实践环节	必修 Required	650219001	博士学位论文（学术型） Doctoral Dissertation		15			16
	必修 Required	650239001	开题报告（博） Literature Reading and The Report on Subject Selection		1			10
	必修 Required	650239002	论文中期进展报告 Thesis Interim Progress Report		1			12
	必修 Required	650239003	参加国内外学术会议并提交论文(博) Participation in International Academic Conferences		1			11-15
	必修 Required	650239004	发表学术论文（博） Publish Academic Papers		1			11-15

#### 博士研究生过程考核要求：

博士研究生的培养实行导师负责制，组成以博士生导师为组长的博士研究生指导小组，负责博士研究生的培养和考核工作。

#### 一、过程管理

1. 博士资格审查（第十学期末以前完成）：是博士生完成主要课程学习后、开展博士学位论文工作前组织的综合考核，是博士生培养过程中的重要环节。资格审查的内容包括博士生课程学习的完成情况、开题报告，学位论文的前期进展情况及其选题是否达到博士论文的水平等。通过博士资格审查后，博士生即可进入博士论文工作阶段。资格审查的具体要求另见考核实施细则。

开题报告应包括的内容为：

- (1) 课题的来源、意义；
- (2) 课题的国内外研究概况及发展趋势；
- (3) 课题的研究内容和技术方案；
- (4) 理论与实践方面预计的创造性成果；
- (5) 主要参考文献。

2. 中期考核（第十三学期末以前完成）：考核内容包含课程学习的完成情况、论文中期进展报告和思想品德三个方面。考核合格的博士生，继续按博士生培养。考核的具体要求另见考核实施细则。

论文中期进展报告是博士生撰写博士学位论文前，要向博士生指导小组或有关学者、专家报告研究工作成果，听取质疑与商讨改进意见，待创造性研究成果获得认同后，方可撰写论文。报告应包含内容：

- (1) 开题后论文工作进展情况；
- (2) 前期取得的成果；
- (3) 下一阶段的计划和改进措施。

#### 3. 参加国内外学术会议并提交论文

博士生在校期间必须积极、主动参加校内外本学科、本专业或其他相关专业的各种学术活动，并达到规定次数。且至少参加一次由国内一级学会组织的全国性会议或者国际会议，并提交论文被接收。

#### 4. 博士研究生申请论文答辩

博士生完成学位论文初稿后，经导师审核认为论文符合要求的，由导师组织有关专家，对学位论文进行预答辩。博士学位论文预答辩应在博士学位论文评审之前完成，预答辩通过后，博士生方可上传评审论文。

博士研究生申请论文答辩的基本条件：

- (1) 修完所规定的课程学分；
- (2) 完成研究环节中开题报告、论文中期进展报告和参加国内外学术会议并提交论文等的学分；
- (3) 博士毕业的学术条件：发表期刊论文一篇。
- (4) 完成博士论文的撰写；
- (5) 通过校内外专家的预答辩和评审。

#### 二、学位论文要求

1. 博士论文选题范围可以是基础研究、应用基础研究或开发研究。博士生的论文工作应以社会发展及科学技术发展中的重要理论问题、实际问题、高新技术、国家基金和重大工程技术问题为背景。

2. 博士学位论文内容应体现学位申请人在光学工程学科掌握坚实的基础理论和系统的专门

知识，并在专门研究方向有系统、深入的专业知识和能力，具有独立从事科学研究工作的能力。论文应体现作者本人创造性思维，创新成果重点在学术创新。

3. 博士生可以以学术期刊论文、学术会议论文、专利、科研奖励、科技报告等多种形式（以下统称相关学术成果）展现其创造性成果。相关学术成果可以作为评价学位论文水平的重要参考。

4. 博士学位论文应是一篇系统、完整的学术文章，内容结构完整、逻辑清晰、论述有据、数据真实、语句通顺，工作量饱满，满足学校学位论文的撰写要求。

### 三、毕业结业及授予学位要求

1. 研究生在规定的学习年限内，完成培养方案规定内容，考核合格，且学位论文答辩通过，经院（系）学位审议委员会或党政联席会审核，学校审批，准予毕业并发给毕业证书。

达到学位授予条件的，可按程序申请学位。未达到学位授予条件的，毕业后一年内若达到学位授予条件，可按程序申请学位。

毕业后申请学位仅限一次。

2. 研究生在校学习已满基本学习年限且在最长学习年限内，未达到毕业要求但符合结业要求的，可申请结业。

具体要求参照学校有关文件执行。

### 四、其余培养要求按照《华中科技大学博士研究生培养工作规定》执行。

如果第 5 年末博士开题未过，就进行第二次分流，进入硕士学习阶段。

#### 硕士研究生过程考核要求：

##### 一、研究环节要求

###### 1. 开题报告

考核以书面报告和口头报告方式。通过考核可正式进入硕士论文工作。具体审核要求另见考核实施细则。开题报告应包含下列内容：

- (1) 课题的来源、意义；
- (2) 课题的国内外研究概况及发展趋势；
- (3) 课题的研究内容和技术方案；
- (4) 理论与实践方面预计的预期成果；
- (5) 主要参考文献。

###### 2. 论文中期进展报告

中期考核在第十二学期末完成，考核以书面报告和口头报告方式。具体审核要求另见考核实施细则。

论文中期进展报告应包含下列内容：

- (1) 开题后论文工作进展情况；
- (2) 取得的成果；
- (3) 下一阶段的计划和措施。

###### 3. 参加校内外公开学术报告会或在学术会议上作报告

在校期间必须积极、主动参加校内外本学科、本专业或其他相关专业的各种学术活动，并达到规定次数；或在学术会议上做报告。

##### 二、学位论文要求

1. 硕士生用于申请硕士学位的创新成果，应当由申请学位的硕士生在读期间独立完成，并以学位论文的形式完整呈现。论文选题应属于本学科专业相关研究方向的基础研究或应用研究课题，有较大的理论意义或应用价值，对学科发展或国家需求有重要学术意义或应用价值。学位论文是进行学位评定的主要依据；

2. 硕士生可以以学术期刊论文、学术会议论文、专著、专利、软件著作权、报告等多种形式（以下统称相关学术成果）展现其创新成果。相关学术成果可以作为评价学位论文水平的重要参考；

3. 论文内容应体现学位申请人在电子科学与技术学科掌握坚实的基础理论和系统的专门知识，且具有从事科学研究工作或独立担负专门技术工作的能力。论文应体现作者本人创造性思维，申请学术型硕士学位的创新成果重点在学术创新；

4. 论文应具有系统性和完整性，表达清楚，论证严谨，引文准确、全面，行文规范。

### **三、毕业结业及授予学位要求**

1. 研究生在规定的学习年限内，完成培养方案规定内容，考核合格，且学位论文答辩通过，经院（系）学位审议委员会或党政联席会审核，学校审批，准予毕业并发给毕业证书。

达到学位授予条件的，可按程序申请学位。未达到学位授予条件的，毕业后一年内若达到学位授予条件，可按程序申请学位。

毕业后申请学位仅限一次。

2. 研究生在校学习已满基本学习年限且在最长学习年限内，未达到毕业要求但符合结业要求的，可申请结业。

具体要求参照学校有关文件执行。

### **四、其它要求**

其余培养要求按照《华中科技大学硕士研究生培养工作规定》执行。

## 未来技术学院本硕博实验班培养计划（人工智能方向） （本研贯通）

### Program for Bachelor-Master-PHD Experimental Class, School of Future Technology

#### 一、培养目标

##### I. Program Objectives

致力于培养德、智、体、美、劳全面发展，科学和工程基础知识扎实，在机械工程、生物医学工程、光电信息科学与工程、自动化等领域具有宽广的专业及跨专业知识，具有多学科视野和国际竞争力的拔尖创新领军人才。毕业生能在未来交叉学科技术方向持续深造，在未来社会急需的智能制造、智能感知、智能健康等技术领域引领科技和产业变革。

The program aims to cultivate tip-top internationalized talents with cross-disciplinary vision. The graduates will have solid foundation in science and engineering with both breadth and depth in fields of Mechanical Engineering, Biomedical Engineering, Optoelectronic Information Science and Engineering, or Automation. The graduates will pursue post-graduate studies at world class graduate schools in cross-disciplinary areas, and are expected to contribute to technical innovation and industrial revolution in Intelligent Manufacturing, Intelligent sense and Intelligent Health.

#### 二、基本规格要求

##### II. Skills profile

毕业生应达到如下要求：

1. 具有科技报国的家国情怀和使命担当，良好的品德修养，良好的科学与工程伦理素养；
2. 具有较好的人文艺术和社会科学素养，较强的社会责任感和良好的职业道德，良好的语言表达能力和人际交流能力；
3. 了解人工智能知识，并具有应用数学、自然科学和工程学知识解决工程学与生物学交叉问题的能力；
4. 具有制订实验方案、进行实验、分析和解释数据的能力；
5. 具有设计一个系统、一个部件或一个过程的能力；
6. 具有对工程问题进行系统表达、建立模型、分析求解和论证的能力；
7. 具有在工程实践中运用各种技术、技能和现代工程工具的能力；
8. 具有创新意识和从事科学研究的初步能力，具有团队合作精神，在多学科工作集体中发挥作用的能力；
9. 能正确认识人工智能对于客观世界、经济、环境和社会的影响，了解与本专业相关的法律法规，熟悉环境保护和可持续发展等方面的方针和政策；
10. 具有国际视野、终生教育的意识和继续学习的能力；
11. 至少掌握一门外语，能熟练阅读本专业外文资料，具有良好的听说能力和跨文化的交流与合作能力。

Graduates should have the following knowledge and capacity:

1. Patriotism and sense of responsibility to support national construction with science and technology strength, good moral quality, a high science and engineering ethical standard.



2. A knowledge of liberal arts and social sciences, an understanding of social, professional and ethical responsibility, and an ability to communicate effectively in oral, written and visual forms.

3. An understanding of Artificial Intelligence, and the capability to apply advanced mathematics, science, and engineering to solve problems at the interface of engineering and biology.

4. An ability to design and conduct experiments, to analyze and interpret data, and to report findings.

5. An ability to design a system, component, or process to meet specifications.

6. An ability to identify, formulate, analyze and solve engineering problems.

7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

8. Innovative thinking, team spirit, a preliminary ability to conduct scientific research, and an ability to function in multi-disciplinary teams.

9. An understanding about the impact of engineering solutions in a global, economic, environmental, and societal context, a knowledge of laws and regulations relevant to engineering, environmental protection and sustainable development.

10. International vision, a recognition of the need for and an ability to engage lifelong learning to remain effective in a climate of continually emerging technologies.

11. A mastery of at least one foreign language, an ability to read foreign references and conduct inter-cultural communication and cooperation.

### 三、培养特色

#### III. Program Features

指导思想：

- 宏观思维能力（系统观念、人文情怀，问题视野，领导力）
- 科学和工程素养（数理化生基础扎实，科学与工程并重）
- 多学科视野（专业能力培养，多专业方向知识，基于项目进行多学科交叉学习）
- 跨文化交流沟通能力（国际化师资，国际交流平台）

Guiding principles:

- Comprehensive thinking (Systematic consideration, humanistic feelings, problem-based view, leadership)
- Science and Engineering knowledge (A solid base of knowledge in mathematics, physics, chemistry and biology; Combination between science and engineering)
- Multidisciplinary view (Track for one major, knowledge for multiple majors, crossing learning by doing project)
- Cross-culture communication skills (Internationalized faculties, international exchange platform)

以培养工学博士为目标，衔接本科教育阶段。以未来技术创新与应用为方向，构建核心基础课程群为主体、个性化交叉课程为辅的课程体系，遵行“群体培养与多元发展相统一、工程实践与科学思维相统一”的人才培养理念，坚持多学科交叉培养、个性化、小班化、国际化、导师制的培养特色，整个本科阶段，导师指导不断线，理论学习不断线，科研实践不断线。

实施“3+1+X”的过程培养模式。前三年，按照信息大类，推行创新素质教育；第四年，自主选择交叉模块进行学习并与研究生阶段衔接。渐进式培养过程中，实行竞争分流和阶段之间有机衔接，本硕连读，并优先推荐免试攻读博士学位。

This program is the undergraduate stage of cultivating engineering doctor. The talent ability

training focuses on the design and manufacture of electronic and/or optoelectronic chips and devices, and is oriented by their applications in optical and/or electronic systems. The curriculum is based on the core courses group, supplemented by personalized and diversified courses. Talent training follows the concept of “the unity of group training and diversified development, the unity of engineering practice and scientific thinking”. This program implements a multi-disciplinary, personalized, small-class, international and mentor-led training system. Mentor guidance, theoretical study and scientific research Practice will run through the entire undergraduate stage.

The process culture mode of “3+1+X” is adopted. In the first two years, we will implement innovative quality education in accordance with the Optical and electronic information classes. In the third year, students will enter the majors of their own choice through major diversion (all the four majors of the Optical and electronic information classes can be chosen). In the fourth year, as the connecting stage of undergraduate and graduate student, in addition to continuing to study undergraduate courses according to the requirements of the training plan, you can also study some graduate courses. In the fifth year, you can begin your doctoral study. In the process of progressive training, competitive diversion and effective linkage between stages will be implemented. Students will continue to study for undergraduate and master’s degrees, and give priority to the test-free recommendation to study for a doctorate.

#### 四、主干学科

##### IV. Major Discipline

光电信息科学与工程

Optoelectronic Information Science and Engineering

集成电路与集成系统

Integrated Circuits & Integrated Systems

机器人 Robotics

人工智能

Artificial Intelligence

生物医学工程 Biomedical Engineering

#### 五、学制与学位

##### V. Program Length and Degree

学制：最低学习年限 8 年，最长学习年限 10 年。

Program Length: Four years

授予学位：工学博士

第一次分流：第 4 年完成本科环节学业可申请学士学位，第二次分流：第 5 年博士开题未通过但完成硕士学业可在第 7 年申请硕士学位。

Degrees Conferred: Bachelor of Engineering

#### 六、学时与学分

##### VI. Hours/Credits

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：203.8

Minimum Credits of Curriculum (Comprising course system and intensive practical training and internship): 203.8

完成学业最低课外学分要求：5

Minimum Extracurricular Credits: 5

## 1. 课程体系学时与学分

Hours/Credits of Course System

博士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	564/30	14.7
	选修	160/10	4.9
学科基础课程	必修	1164/69.8	34.2
专业核心课程	必修	440/26	12.8
本硕衔接课程	必修	374/23	11.3
博士阶段课程	必修	164/10	4.9
集中性实践教学环节(本科阶段)	必修	45w/16	7.9
集中性实践教学环节(博士研究生阶段)	必修	19	9.3
总计		2866+45w/203.8	100
其中, 总实验(实践)学时学分		35	17.2

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	564/30	14.7
	Elective	160/10	4.9
Discipline-related General Courses	Required	1164/69.8	34.2
Professional Core Curriculum	Required	440/26	12.8
Undergraduate Pathway Programs	Required	374/23	11.3
PhD level courses	Required	164/10	4.9
Internship and Practical Training( Undergraduate)	Required	45w/16	7.9
Internship and Practical Training( postgraduate)	Required	19	9.3
Total		2866+45w/203.8	100
Practicum Credits		35	17.2

硕士学位

课程类别	课程性质	学时/学分	占课程体系学时比例 (%)
素质教育通识课程	必修	564/30	16.0
	选修	160/10	5.3
学科基础课程	必修	1164/69.8	37.2
专业核心课程	必修	440/26	13.8
硕士阶段课程(其中本硕衔接阶段至少12学分)	必修	374/23	12.2
集中性实践教学环节(本科阶段)	必修	45w/16	8.6
集中性实践教学环节(硕士研究生阶段)	必修	13	6.9
总计		2702+45w/187.8	100
其中, 总实验(实践)学时学分		39	21

Course Classified	Course Nature	Hrs/Crs	Percentage (%)
Essential-qualities-oriented Education General Courses	Required	564/30	16.0
	Elective	160/10	5.3
Discipline-related General Courses	Required	1164/69.8	37.2
Professional Core Curriculum	Required	440/26	13.8
Undergraduate Pathway Programs	Required	374/23	12.2
Internship and Practical Training (Undergraduate)	Required	45w/16	8.6
Internship and Practical Training (Master)	Required	13	6.9
Total		2702+45w/187.8	100
Practicum Credits		39	21

## 2. 集中性实践教学环节周数与学分

Weeks/Credits of Intensified Internship and Practical Training

实践教学环节名称	课程性质	周数/学分	占实践教学环节学时比例 (%)
军事训练	必修	2w/1	2.9
专业方向课程设计	必修	2w/1	2.9
创新项目实践	必修	6w/3	8.5
企业项目实践	必修	4w/2	5.7
毕业设计(论文)	必修	16w/6	17.1
实验室轮转	必修	15w/3	8.6
开题报告	必修	1	2.9
论文中期进展报告	必修	1	2.9
参加国内外学术会议并提交论文	必修	1	2.9
发表学术论文	必修	1	2.9
博士学位论文	必修	15	42.7
合计	必修	35	100

Internship & Practical Training	Course Nature	Weeks/Credits	Percentage (%)
Military Training	Required	2w/1	2.9
Discipline Perceive Practice	Required	2w/1	2.9
Innovative Project Practice	Required	6w/3	8.5
Entrepreneurial Project Practice	Required	4w/2	5.7
Undergraduate Thesis	Required	16w/6	17.1
Lab rotation	Required	15w/3	8.6
Literature reading and the report on subject selection	Required	1	2.9
Thesis Interim Progress Report	Required	1	2.9
Participation in International academic conferences	Required	1	2.9
Publish academic papers	Required	1	2.9
Doctoral Dissertation	Required	15	42.7
Total	Required	35	100

## 3. 课外学分(本科阶段)

Extracurricular Credits

序号	课外活动名称	课外活动和社会实践的要求		学分
1	社会实践活动	提交社会调查报告，通过答辩者		1
		个人被校团委或团省委评为社会实践活动积极分子者，集体被校团委或团省委评为优秀社会实践队者。		2
2	思政课社会实践（必修）	提交调查报告，取得成绩		2
3	劳动教育（必修）	32学时		2
4	英语及计算机考试	全国大学英语六级考试	考试成绩达到学校要求者	2
		托福考试	达90分以上者	3
		雅思考试	达6.5分以上者	3
		GRE考试	达325分以上者	3
		全国大学英语口语成绩	A，B，C，	3,2,1
		全国计算机等级考试	获二级以上证书者	2
		全国计算机软件资格、水平考试	获程序员证书者	2
			获高级程序员证书者	3
5	竞赛	校级	获一等奖者	3
			获二等奖者	2
			获三等奖者	1
		省级	获一等奖者	4
			获二等奖者	3
			获三策奖者	2

续表

序号	课外活动名称	课外活动和社会实践的要求		学分
5	竞赛	全国	获一等奖者	6
			获二等奖者	4
			获三等奖者	3
6	论文、专利	根据论文水平	每篇论文	2-5
		发明专利授权	每项前两名	2
		实用新型、软件著作权	每项前两名	1
7	参加科研和创新设计活动	参与科研项目时间与科研能力；纳入创新计划；提交结题报告、导师审查评分、学院审核。		1-3

说明：参加校级体育运动会获第一名、第二名者与校级一等奖等同，获第三名至第五名者与校级二等奖等同，获第六名至第八名者与校级三等奖等同。

No.	Extracurricular Activities and Social Practice	Requirements		Extracurricular Credits
1	Activities of Social Practice	Submit report and pass oral defense		1
		Entitled as Activist by the Communist Youth League of HUST or Hubei Province; Membership of the group that is entitled as Excellent Social Practice Group by the Communist Youth League of HUST or Hubei Province		2
2	Ideological and Political Course Social Practice	Submit a report and obtain a passing score		2
3	Public Service Work	(Labor education) (required 32 Hours/2 Credits)		2
4	Examinations in English and Computer	CET-6	Students whose Band-6 exam scores accord our requirements	2
		TOEFL	90 Points or Higher	3
		IELTS	6.5 Points or Higher	3
		GRE	1350 Points or Higher	3
		CET Oral Examination	A、B、C	3,2,1
		National Computer Rank Examination	Win certificate of Band-2 or higher	2
		National Computer Software Qualification	Win certificate of programmer	2
			Win certificate of Advanced Programmer	3
5	Competitions	University Level	Win certificate of System Analyst	4
			Win first prize	3
			Win second prize	2
		Provincial Level	Win third prize	1
			Win first prize	4
			Win second prize	3
		National Level	Win third prize	2
			Win first prize	6
			Win second prize	4
6	Research articles	National Journals	Per piece	2
		SCI Journals	Per piece	4
7	Scientific Research and Extracurricular Activity	Depending on time and quality of the research; Selected by the innovation scheme; Submit report, scored by supervisors, evaluated by the School		1-3

Note: In HUST Sports Meeting, the first and the second prize, the third to the fifth prize, and the sixth prize to the eighth prize are deemed respectively the first prize, the second prize and the third prize of university level

## 七、教学进程计划表

### VII. Course Schedule

院（系）：未来技术学院

School: School of Future Technology

专业：依据专业方向

Major: Major Dependent

华中科技大学 2022 级本科专业培养计划

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	MAX0022	思想道德与法治 Ethics and Rule of Law	40	2.5			1
	必修 Required	MAX0042	中国近现代史纲要 Survey of Modern Chinese History	40	2.5			2
	必修 Required	MAX0013	马克思主义基本原理 Theory of Marxism	40	2.5			3
	必修 Required	MAX0063	毛泽东思想和中国特色社会主义理论体系概论 General Introduction to Mao Zedong Thought and Socialist Theory with Chinese Characteristics	48	3			4
	必修 Required	MAX0072	习近平新时代中国特色社会主义思想概论 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	48	3			3
	必修 Required	MAX0032	形势与政策 Situation and Policy	48	1.5			5-7
	必修 Required	PHE0002	大学体育（一） Physical Education ( I )	60	1.5			1-2
	必修 Required	PHE0012	大学体育（二） Physical Education ( II )	60	1.5			3-4
	必修 Required	PHE0022	大学体育（三） Physical Education ( III )	24	1			5-6
	必修 Required	CHI0001	中国语文 Chinese	32	2			1
	必修 Required	RMWZ0002	军事理论 Military Theory	36	2			2
	选修 Elective		从不同的课程模块中修读若干课程，总学分不低于10 学分，其中美育教育类课程、《大学生心理健康》均不低于2 学分 General Education Courses (aesthetic education 2credits at minimum)	160	10			2-8
学科基础课程 Discipline-related General Courses	必修 Required	SFL0003	综合英语（一） Comprehensive English ( I )	48	3			1
	必修 Required	SFL0013	综合英语（二） Comprehensive English ( II )	48	3			2
	必修 Required	MAT0552	微积分（A）上 Calculus ( I )	96	6			1
	必修 Required	MAT0532	微积分（A）下 Calculus ( II )	96	6			2
	必修 Required	MAT0722	线性代数（A） Linear Algebra	48	3			1
	必修 Required	MAT0592	概率论与数理统计（A） Probability and Mathematics Statistics	48	3			2
	必修 Required	MAT0561	复变函数与积分变换 Complex Function and Integral Transform	40	2.5			3
	必修 Required	MAT0701	数理方程与特殊函数 Equations of Mathematical Physics Special Functions	40	2.5			4

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
学科基础课程 Discipline-related General Courses	必修 Required	PHY0511	大学物理 (一) Physics ( I )	64	4			2
	必修 Required	PHY0521	大学物理 (二) Physics ( II )	64	4			3
	必修 Required	PHY0551	物理实验 (一) Physical Experiments ( I )	32	1	32		2
	必修 Required	PHY0561	物理实验 (二) Physical Experiments ( II )	24	0.8	24		3
	必修 Required	MESE0891	工程制图 (一) Engineering Graphics ( I )	40	2.5			1
	必修 Required	QMX0011	科学思维与研究方法 (新生研讨课) Method of Scientific Thinking and Research	16	1			1
	必修 Required	SFT0001	普通化学 General Chemistry	64	3.5	16		2
	必修 Required	BIO0261	普通生物学 General Biology	32	2			4
	必修 Required	OEI0561	软件技术基础 Fundamental of Software Programming	48	3			1
	必修 Required	SFT0031	数据结构与算法设计 Data Structure and Algorithm Design	60	3		24	3
	必修 Required	SFT0021	科技阅读与写作 Academic Reading and Writing	32	2			3
	必修 Required	OEI5801	人工智能导论 Foundation of Artificial Intelligence	32	2			4
	必修 Required	SFT0041	单片机与嵌入式系统 Microcontroller & Embedded System	72	4.5	8		5
	必修 Required	EIC2131	线性电路理论与实验 Circuit Theory and Experiments	72	4.5	16		4
	必修 Required	EIC2031	电子器件与电路 Electronic Devices and Circuits	72	4.5	16		5
	必修 Required	OEI0581	信号与线性系统 Signals and Linear Systems	56	3.5		4	4
专业核心课程 Major-Specific Core Courses	必修 Required	SFT0051	理论力学 Theoretical Mechanics	32	2			4
	必修 Required	SFT0071	电动力学 Electrodynamics	32	2			4
	必修 Required	SFT0081	量子力学 Quantum Mechanics	32	2			5
	必修 Required	SFT0111	热力学与统计力学 Thermodynamics and Statistical Mechanics	32	2			5
	必修 Required	SFT0121	模式识别与机器学习 Pattern Recognition & Machine Learning	48	3			5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
Major-Specific Core Courses 专业核心课程	必修 Required	AUT5951	数据科学基础 Foundation of Data Science	32	2			6
	必修 Required	AUT5501	人机交互技术 Human-computer Interaction Technology	32	2			6
	必修 Required	AUT2222	自动控制原理（一） Control Theory（I）	56	3.5			6
	必修 Required	AUT6082	脑与认知科学导论 Introduction to Brain and Cognition Science	32	2	8		6
	必修 Required	AUT6171	虚拟现实技术 Virtual Reality Technology	32	2			6
	必修 Required	AUT6231	智能芯片设计 Design of Intelligent Chip	32	2			6
	必修 Required	SFT0151	光电探测与信号处理 Optoelectronic Detection and Signal Processing	72	4	16		6
		选课说明	校级公共课可以选在 7-10 学期完成。					
校级公共课 硕士阶段课程	必修 Required	408110001	自然辩证法概论	18	1			7-10
	必修 Required	408130001	新时代中国特色社会主义理论与实践研究	36	2			7-10
	必修 Required	411130003	第一外国语（英语一）	32	2			7-10
本硕博衔接课程 一级基础课		选课说明	要求第 7, 8 学期, 一级基础课、二级基础课至少各选修 5 学分					
	必修 Required	一级基础课	学术规范与论文写作（人工智能学院）	16	1			8
	限选							
	选修 Elective	AUT5641	数字图像处理 Digital Image Processing	32	2			7
	选修 Elective	AUT5351	计算机视觉 Computer Vision	32	2	8		8
	选修 Elective	AUT6331	视觉认知工程 Cognitive Engineering for Vision	32	2			7
	选修 Elective	AUT6251	自主智能系统 Swarm Intelligence	32	2			8
	选修 Elective	AUT2232	自动控制原理（二） Control Theory（II）	40	2.5			5
	选修 Elective	184111037	图像分析	32	2			8
	选修 Elective	184111013	纳米科学导论	32	2			7



续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
	选修 Elective	184111035	现代最优化理论与方法	32	2			7
	选修 Elective	184231006	凸优化理论及算法	32	2			8
本硕博衔接课程 二级基础课	选修 Elective	184111005	高级计算机视觉	32	2			8
	选修 Elective	184231007	高级机器学习	32	2			7
	选修 Elective	184131010	模式识别理论	32	2			7
	选修 Elective	184111007	系统辨识	32	2			7
	选修 Elective	184111012	随机运筹学	32	2			7
	选修 Elective	184111014	决策支持系统	32	2			7
	选修 Elective	184111036	现代数字图像处理	32	2			7
	选修 Elective	184111028	自适应与学习系统	32	2			7
	选修 Elective	184111029	数据统计与监测	32	2			7
	选修 Elective	184231002	智能计算系统	32	2			8
	选修 Elective	184231008	计算神经科学	32	2			7
本硕博衔接课程 数学课		选课说明	数学课限选一门					
	选修 Elective	11110001	矩阵论	48	3			7
	选修 Elective	11110005	随机过程	48	3			7
	选修 Elective	11110002	数值分析	48	3			8
	选修 Elective	11110004	数理统计	48	3			7
硕士选修课		选课说明	第 9, 10 学期, 要求专业选修课 2 门 (可选择前面未选择的一二级基础课程), 跨一级学科 1 门 (从学院其他方向中任选 1 门)。					
	选修 Elective	184131004	机器人导论	32	2			7
	选修 Elective	184111019	遥感图像处理与分析	16	1			8

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
硕士选修课	选修 Elective	184111020	飞行器导航制导技术	16	1			8
	选修 Elective	184111021	复杂网络与群体智能	16	1			8
	选修 Elective	184111033	多谱成像原理与技术	32	2			7
	选修 Elective	184131007	数据挖掘技术	32	2			7
	选修 Elective	184111032	形式语言与自动机	32	2			7
	选修 Elective	184111030	数字视频处理	32	2			7
	选修 Elective	184111025	图像处理中的数学方法	32	2			7
	选修 Elective	184131005	信息系统工程	32	2			7
	选修 Elective	184111024	博弈分析	32	2			7
	选修 Elective	184111023	计算智能	32	2			7
跨学科课程	必修 Required		从学院或者计算机、网安、电信、光电其他方向中任选 1 门	32	2			9-10
校级公共课			第五年末完成博士开题后，进入博士阶段课程学习					
	必修 Required	408210001	中国马克思主义与当代 Chinese Marxism	36	2			11
	必修 Required	411210001	英语论文写作 English Academic Writing	32	2			11
跨学科课程	必修 Required		可以选其他校级公选课或者其他方向的研究生专业课	32	2			11-12
博士专修课			第六年要求学习 2 门博士专修课程					
	选修 Elective	新课	博士生专题讲座 Seminar Course for PhD Students	32	2			12
	选修 Elective	184231001	类脑智能科学前沿讲座	16	1			11
	选修 Elective	184231004	智能医疗前沿讲座	16	1			11
	选修 Elective	184231005	智能武器前沿讲座	16	1			11
	选修 Elective	184211012	目标识别与跟踪研讨课	16	1			12

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 including		设置学期 semester
						实验 exp	上机 operation	
博士专修课	选修 Elective	184211010	模式识别与智能系统研讨课	16	1			12
	选修 Elective	184211001	系统工程与决策分析	32	2			12
	选修 Elective	184211008	图像处理中的优化方法	32	2			11
	选修 Elective	184211014	大数据基础	32	2			11
本科实践环节	必修 Required	RMWZ3511	军事训练 Military Training	2w	1			1
	必修 Required	SFT0171	专业方向课程设计 Discipline Perceive Practice	2w	1			4
	必修 Required	SFT0181	创新项目实践 Innovative Project Practice	6w	3			5, 6
	必修 Required	SFT0191	企业项目实践 Entrepreneurial Project Practice	4w	2			6
	必修 Required	SFT0201	本科毕业设计（论文） Undergraduate Thesis	16w	6			7, 8
	必修 Required	SFT0211	实验室轮转 Lab Rotation	15w	3			2, 3
硕士研究生实践环节	必修 Required	650119001	开题报告 Literature Reading and the Report on Subject Selection		1			10
	必修 Required	650139001	论文中期进展报告 Thesis Interim Progress Report		1			12
	必修 Required	650139002	参加校内外公开学术报告会或在学术会议上作报告 Participate in Public Academic Lectures on and Off Campus or Give Presentations at Academic Conferences		1			9-14
	必修 Required	650139003	学位论文 Master Thesis		10			14
博士研究生实践环节	必修 Required	650219001	博士学位论文（学术型） Doctoral Dissertation		15			16
	必修 Required	650239001	开题报告（博） Literature reading and The Report on Subject Selection		1			10
	必修 Required	650239002	论文中期进展报告 Thesis Interim Progress Report		1			12
	必修 Required	650239003	参加国内外学术会议并提交论文(博) Participation in International Academic Conferences		1			11-15
	必修 Required	650239004	发表学术论文（博） Publish Academic Papers		1			11-15

### 博士研究生过程考核要求：

博士研究生的培养实行导师负责制，组成以博士生导师为组长的博士研究生指导小组，负责博士研究生的培养和考核工作。

#### 一、过程管理

1. 博士资格审查(第十学期末以前完成)：是博士生完成主要课程学习后、开展博士学位论文工作前组织的综合考核，是博士生培养过程中的重要环节。资格审查的内容包括博士生课程学习的完成情况、开题报告，学位论文的前期进展情况及其选题是否达到博士论文的水平等。通过博士资格审查后，博士生即可进入博士论文工作阶段。资格审查的具体要求另见考核实施细则。

开题报告应包括的内容为：

- (1) 课题的来源、意义；
- (2) 课题的国内外研究概况及发展趋势；
- (3) 课题的研究内容和技术方案；
- (4) 理论与实践方面预计的创造性成果；
- (5) 主要参考文献。

2. 中期考核(第十三学期末以前完成)：考核内容包含课程学习的完成情况、论文中期进展报告和思想品德三个方面。考核合格的博士生，继续按博士生培养。考核的具体要求另见考核实施细则。

论文中期进展报告是博士生撰写博士学位论文前，要向博士生指导小组或有关学者、专家报告研究工作成果，听取质疑与商讨改进意见，待创造性研究成果获得认同后，方可撰写论文。报告应包含内容：

- (1) 开题后论文工作进展情况；
- (2) 前期取得的成果；
- (3) 下一阶段的计划和改进措施。

#### 3. 参加国内外学术会议并提交论文

博士生在校期间必须积极、主动参加校内外本学科、本专业或其他相关专业的各种学术活动，并达到规定次数。且至少参加一次由国内一级学会组织的全国性会议或者国际会议，并提交论文被接收。

#### 4. 博士研究生申请论文答辩

博士生完成学位论文初稿后，经导师审核认为论文符合要求的，由导师组织有关专家，对学位论文进行预答辩。博士学位论文预答辩应在博士学位论文评审之前完成，预答辩通过后，博士生方可上传评审理文。

博士研究生申请论文答辩的基本条件：

- (1) 修完所规定的课程学分；
- (2) 完成研究环节中开题报告、论文中期进展报告和参加国内外学术会议并提交论文等的学分；
- (3) 博士毕业的学术条件：发表期刊论文一篇。
- (4) 完成博士论文的撰写；
- (5) 通过校内外专家的预答辩和评审。

#### 二、学位论文要求

1. 博士论文选题范围可以是基础研究、应用基础研究或开发研究。博士生的论文工作应以社会发展及科学技术发展中的重要理论问题、实际问题、高新技术、国家基金和重大工程技术问题为背景。

2. 博士学位论文内容应体现学位申请人在光学工程学科掌握坚实的基础理论和系统的专门知识，并在专门研究方向有系统、深入的专业知识和能力，具有独立从事科学研究工作的能力。

论文应体现作者本人创造性思维，创新成果重点在学术创新。

3. 博士生可以以学术期刊论文、学术会议论文、专利、科研奖励、科技报告等多种形式（以下统称相关学术成果）展现其创造性成果。相关学术成果可以作为评价学位论文水平的重要参考。

4. 博士学位论文应是一篇系统、完整的学术文章，内容结构完整、逻辑清晰、论述有据、数据真实、语句通顺，工作量饱满，满足学校学位论文的撰写要求。

### 三、毕业结业及授予学位要求

1. 研究生在规定的学习年限内，完成培养方案规定内容，考核合格，且学位论文答辩通过，经院（系）学位审议委员会或党政联席会审核，学校审批，准予毕业并发给毕业证书。

达到学位授予条件的，可按程序申请学位。未达到学位授予条件的，毕业后一年内若达到学位授予条件，可按程序申请学位。

毕业后申请学位仅限一次。

2. 研究生在校学习已满基本学习年限且在最长学习年限内，未达到毕业要求但符合结业要求的，可申请结业。

具体要求参照学校有关文件执行。

四、其余培养要求按照《华中科技大学博士研究生培养工作规定》执行。

如果第 5 年末博士开题未过，就进行第二次分流，进入硕士学习阶段。

### 硕士研究生过程考核要求：

#### 一、研究环节要求

##### 1. 开题报告

开题答辩在第十学期末完成，考核以书面报告和口头报告方式。文献阅读量一般在 30 篇以上，其中外文 10 篇以上。通过开题答辩可正式进入论文工作。具体审核要求另见考核实施细则。

开题报告应包含下列内容：

- (1) 课题的来源、意义；
- (2) 课题的国内外研究概况及发展趋势；
- (3) 课题的研究内容和技术方案；
- (4) 理论与实践方面预计的预期成果；
- (5) 主要参考文献。

##### 2. 论文中期进展报告

中期考核在第十二学期末完成，考核以书面报告和口头报告方式。具体审核要求另见考核实施细则。

论文中期进展报告应包含下列内容：

- (1) 开题后论文工作进展情况；
- (2) 取得的成果；
- (3) 下一阶段的计划和措施。

##### 3. 参加校内外公开学术报告会或在学术会议上作报告

在校期间必须积极主动参加校内外本学科、本专业其他相关专业的各种学术活动，并达到规定次数；或在学术会议上做报告。

#### 二、学位论文要求

1. 硕士生用于申请硕士学位的创新成果，应当由申请学位的硕士生在攻读学位期间独立完成，并以学位论文的形式完整呈现。论文选题应属于本学科专业相关研究方向的基础研究或应用研究课题，有较大的理论意义或应用价值，对学科发展或国家需求有重要学术意义或应用价值。

学位论文是进行学位评定的主要依据；

2. 硕士生可以以学术期刊论文、学术会议论文、专著、专利、软件著作权、报告等多种形式（以下统称相关学术成果）展现其创新成果。相关学术成果可以作为评价学位论文水平的重要参考；

3. 论文内容应体现学位申请人在人工智能学科掌握坚实的基础理论和系统的专门知识，且具有从事科学研究工作或独立担负专门技术工作的能力。论文应体现作者本人创造性思维，申请学术型硕士学位的创新成果重点在学术创新；

4. 论文应具有系统性和完整性，表达清楚，论证严谨，引文准确、全面，行文规范。

### **三、毕业结业及授予学位要求**

1. 研究生在规定的学习年限内，完成培养方案规定内容，考核合格，且学位论文答辩通过，经院（系）学位审议委员会或党政联席会审核，学校审批，准予毕业并发给毕业证书。

达到学位授予条件的，可按程序申请学位。未达到学位授予条件的，毕业后一年内若达到学位授予条件，可按程序申请学位。

毕业后申请学位仅限一次。

2. 研究生在校学习已满基本学习年限且在最长学习年限内，未达到毕业要求但符合结业要求的，可申请结业。

具体要求参照学校有关文件执行。

### **四、其它要求**

其余培养要求按照《华中科技大学硕士研究生培养工作规定》执行。