

电子信息工程专业培养方案

Programme Specification for Electronic and Electrical Engineering

I. 专业介绍 Introduction

本专业学生应掌握电气与电子工程的基本原理和理论，包括硬件和计算机软件。学生应具有足够的专业知识，较强的实践能力、创新能力和完成学业的研发能力。毕业生可以在计算机测控、信息处理和相关领域从事技术研发、运行管理、教学或研究等工作。

西南交大-利兹学院“电子信息工程”专业联合了上述两所大学相关专业的优势而设置。

The students on this programme will understand the basic principles and theory of Electrical and Electronic Engineering including hardware and computer software. They shall possess adequate professional knowledge, strong practical skills and innovation, and research and development capabilities on completing their studies. Upon graduation, they will be prepared to engage in research and development of technology and operation management in the computer measurement and control, information processing, teaching and research in related areas.

The "Electronic and Electrical Engineering" programme of Southwest Jiaotong University-Leeds College combines the advantages of the relevant programme of the two universities.

专业代码: 080701H

Programme Code: 080701H

专业名称: 电子信息工程

Programme Name: Electronic and Electrical Engineering

II. 培养目标 Objectives

• 在电子电路理论，电磁学，电子材料，计算机，通信和嵌入式系统等电子及电气工程主要基础学科提供深入教育。

• 在电气工程方面提供专业知识，例如电气系统，电力驱动和电子控制系统。

• 提供研究主导课程和所有课题的学习方法，尤其是在电气系统，电力驱动，电子控制系统和可再生能源系统。

• 演示电气工程在工业中的应用，尤其是在发电，电子汽车和工业控制行业。

• 培养学生在书写/口头沟通，管理，领导方面的通用，可转移技能和工程或其他专业的商业。

• 通过实验室工作提供大量电子和电气工程实践经验，在每年学习中完成一个广泛的独立项目。

• To provide in-depth education in the key underpinning topics of electronic and electrical engineering such as electronic circuit theory, electromagnetism, electronic materials, computing, communications and embedded systems.

• To offer specialisation in topics in electrical engineering, such as electrical power systems, electric drives and electronic control systems.

• To provide a research-led curriculum and learning approaches in all topics, in particular in electrical power systems, electric drives, electronic control systems, and renewable energy systems.

- To demonstrate the application of electrical engineering in industry; especially in the power generation, electronic vehicle, and industrial control sectors.
- To develop students' generic and transferable skills in written/verbal communication, management, leadership and business for careers in engineering or other professions.
- To provide extensive practical experience of electronic and electrical engineering through laboratory work and the completion of an extensive independent project in every year of study.

III. 专业毕业要求 Graduation Requirements

1. **工程知识:** 具备数学、自然科学、电子信息基础和专业基础知识, 并能够将其用于描述、分析和解决电子信息工程领域的复杂工程问题。
2. **问题分析:** 能够应用数学、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子信息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:** 能够设计针对电子信息工程领域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), 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子信息工程问题进行研究, 包括设计实验、分析、处理与解释数据、并通过信息综合得到合理有效的结论。
5. **使用现代工具:** 能够针对电子信息工程领域的复杂工程问题, 选择、使用与开发恰当的技术、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:** 能够基于电子信息工程专业背景知识进行合理分析, 评价电子信息工程领域相关复杂工程项目和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子信息工程领域相关复杂工程问题的工程实践对环境、社会可持续发展的影响。
8. **职业规范:** 具有人文社会科学素养、社会责任感, 能够在电子信息工程实践中理解并遵守工程职业道德和规范, 具备正确履行自己责任的能力。
9. **个人和团队:** 能够在多学科背景下的工程项目或技术开发团队中承担个体、团队成员以及负责人的角色。
10. **沟通:** 能够就电子信息工程领域相关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。
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。

1. **Engineering knowledge:** Have basic knowledge of mathematics, natural science, electronic information and professional knowledge; and to describe, analyze and solve complex engineering problems in the field of electronic information engineering.

2. **Problem analysis:** The basic principles of mathematics, natural science and engineering science can be applied to identify, express and analyze complex engineering problems in the field of electronic information engineering through literature research, so as to obtain effective conclusions.

3. **Design/Development Solutions:** To provide solutions to complex engineering problems in the field of electronic information engineering, to design systems, units (components) that meet specific needs, to embody

innovation awareness in the design process, and to take into account of social, health, safety, legal, cultural and environmental considerations.

4. **Research:** Based on scientific principles and using scientific methods to study complex electronic information engineering problems, including designing experiments, analyzing, processing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.

5. **Use modern tools:** Be able to select, use and develop appropriate technologies, resources, modern engineering tools and information technology tools for complex engineering problems in the field of electronic information engineering, including prediction and Simulation of complex engineering problems, and understand their limitations.

6. **Engineering and Society:** To be able to conduct a reasonable analysis based on the professional background knowledge of electronic information engineering, to evaluate the impact of complex engineering projects and solutions to engineering problems in the field of electronic information engineering on society, health, safety, law and culture, and to understand the responsibilities to be undertaken.

7. **Environment and Sustainable Development:** Ability to understand and evaluate the impact of engineering practice on environmental and social sustainable development of complex engineering problems in the field of electronic information engineering.

8. **Professional norms:** with humanities and Social Sciences literacy, social responsibility, can understand and abide by engineering professional ethics and norms in the practice of electronic information engineering, and have the ability to perform their responsibilities correctly.

9. **Individuals and teams:** able to assume the roles of individuals, team members and leaders in a multidisciplinary project or technology development team.

10. **Communication:** To be able to effectively communicate with colleagues from industry and the public on complex engineering issues related to electronic information engineering, including writing reports and designing manuscripts, presenting statements, expressing clearly or responding to instructions; have a certain international perspective, and communicate in cross-cultural context.

11. **Project management:** Understand and master the principles of engineering management and economic decision-making methods, and can apply the above knowledge in a multidisciplinary environment.

12. **Lifelong learning:** with the awareness of self-learning and lifelong learning, and the ability to constantly learn and adapt to social development.

IV. 学制与学位 Duration and Degree

学制:

四年制 Duration: 4 Years

学位:

西南交通大学 Southwest Jiaotong University

工学学士 Degree: Bachelor of Engineering

利兹大学 University of Leeds

分级荣誉工学学士学位 Degree: Bachelor of Engineering with Classified Honours

V. 主干学科与专业核心课程 Main Subject and Specialized Core Course

主干学科: 计算机科学与技术、控制科学与工程、电气工程、电子科学与技术

Main Subject: Computer Science and Technology, Control Science and Engineering, Electrical Engineering, Electronic Science and Technology

专业核心课程: 物理1: 力学与波、物理2: 热学和电磁学、数学1、数学2、英语、工程数学、算法和计算数学、高级工程数学、电子设计项目、物理电子学1、物理电子学2、电子电路设计、高频电子技术、晶体管和光电器件、通信原理、电力电子技术、控制系统、嵌入式系统项目、微处理器和可编程逻辑、专业研究、集成电路设计、射频与微波工程、数字通讯、电机学、嵌入式系统

Specialized Core Course: Physics 1: Mechanics and Waves, Physics 2: Thermodynamics and Electricity, Mathematics 1, Mathematics 2, English for Engineering, Further Engineering Mathematics, Electronic Design Project, Physical Electronics 1, Physical Electronics 2, Electronic Circuit Design, High Frequency Electronics, Transistors and Optoelectronic Devices, Communications Theory, Power Electronics, Control Systems, Embedded Systems Project, Microprocessors and Programmable Logic, Professional Studies, Integrated Circuit Design, RF and Microwave Engineering, Digital Communications, Electric Machines, Embedded Systems

VI. 毕业学分基本要求 Basic Requirements of Credits for Graduation

课程体系 Curriculum System		学分要求 Credits Requirements						
		必修 Compulsory		限修 Distributional Electives		任选 Free Electives		小计 Subtotal
		理论 Theory	实践 Practice	理论 Theory	实践 Practice	理论 Theory	实践 Practice	
学科与专业基础课程 Discipline and Specialty Foundational Courses	数学与自然科学基础课 Foundational Courses on Mathematics and Natural Science （专业核心课程 Specialized Core Course）	16	2					18
	专业基础课 Professional Foundational Courses （专业核心课程 Specialized Core Course）	18	0					18
专业课程 Specialized Courses	专业核心课程 Specialized Core Course			48	45			93
实习实践教学 Practice Courses	专业实践 Specialty Practices	0	0					0
	毕业设计 Graduation Design	0	15					15
附加环节 Additional Part	跨学科课程 Interdisciplinary Courses					0	0	0

公共基础课程 Public Basic Courses	思想政治类 Ideological Politics Courses	15	2					17
	军事类 Military Courses	2	2					4
	体育类 Physical Education Courses		4					4
必修环节 Compulsory Part	大学生综合素质提升、学生体质达标测评 Comprehensive Quality Improvement Courses for College Students, Assessment of Students' Physical Fitness	0	0					0
总 计 Total								169

VII. 课程设置细化表 Course Programs Table

学科与专业基础课程 Discipline and Specialty foundational Courses 共 36 学分，其中必修 36 学分，限选 0 学分，任选 0 学分 A total credits of 36, including 36 for compulsory courses, 0 for distributional electives and 0 for free electives							
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class Practice Credits	开课学期 Semester	开课学院 School	备注 Notes
数学与自然科学基础课 Foundational Courses on Mathematics and Natural Science (专业核心课程 Specialized Core Course)	物理 1: 力学与波 Physics 1: Mechanics and Waves	必修 Compulsory	4.5	1	第 1 学期 1St semester	利兹学院 SWJTU-Leeds Joint School	升级课程
	物理 2: 热学和电磁学 Physics 2: Thermodynamics and Electricity	必修 Compulsory	4.5	1	第 2 学期 2Nd semester	利兹学院 SWJTU-Leeds Joint School	升级课程
	数学 1 Mathematics 1	必修 Compulsory	4.5	0	第 1 学期 1St semester	利兹学院 SWJTU-Leeds Joint School	升级课程
	数学 2 Mathematics 2	必修 Compulsory	4.5	0	第 2 学期 2Nd semester	利兹学院 SWJTU-Leeds Joint School	升级课程
专业基础课 Professional Foundational Courses (专业核心课程 Specialized Core Course)	英语 English for Engineering	必修 Compulsory	18	0	第 1-2 学期 1St -2Nd semester	利兹学院 SWJTU-Leeds Joint School	升级课程

专业课程 Specialized Courses 共 93 学分，其中必修 0 学分，限选 93 学分（第 3、4 学期限选 36 学分，其中 30 学分课程必须通过，其余 6 学分课程每门成绩不低于 45 分；第 5、6 学期限选 36 学分，其中 30 学分课程必须通过，其余 6 学分课程每门成绩不低于 45 分；第 7、8 学期限选 21 学分，其中 15 学分课程必须通过，其余 6 学分课程每门成绩不低于 45 分），任选 0 学分 A total credits of 93 for graduation, including 0 for compulsory courses, 93 for distributional electives and 0 for optional electives							
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践 学分 In-class Practice Credits	开课学期 Semester	开课学院 School	备注 Notes
专业核心课程 Specialized Core Course	通信网络和信号 Communication Networks and Signals	限修 Distributional	3	1	第 3 学期 3Rd semester	利兹学院 SWJTU-Leeds Joint School	
	工程数学 Engineering Mathematics	限修 Distributional	3	0	第 3 学期 3Rd semester	利兹学院 SWJTU-Leeds Joint School	
	算法和计算数学 Algorithms and Numerical Mathematics	限修 Distributional	3	2	第 3 学期 3Rd semester	利兹学院 SWJTU-Leeds Joint School	
	物理电子学 1 Physical Electronics 1	限修 Distributional	3	1	第 3 学期 3Rd semester	利兹学院 SWJTU-Leeds Joint School	
	物理电子学 2 Physical Electronics 2	限修 Distributional	3	0	第 4 学期 4Th semester	利兹学院 SWJTU-Leeds Joint School	
	电路分析与设计 Circuit Analysis and Design	限修 Distributional	6	4	第 3-4 学期 3Rd-4Th semester	利兹学院 SWJTU-Leeds Joint School	
	数字电子和微控制器 Digital Electronics and Microcontrollers	限修 Distributional	6	5	第 3-4 学期 3Rd-4Th semester	利兹学院 SWJTU-Leeds Joint School	
	通信系统 Communication Systems	限修 Distributional	3	2	第 4 学期 4Th semester	利兹学院 SWJTU-Leeds Joint School	
	高级工程数学 Further Engineering Mathematics	限修 Distributional	3	0	第 4 学期 4Th semester	利兹学院 SWJTU-Leeds Joint School	
	电子设计项目 Electronic Design Project	限修 Distributional	3	3	第 4 学期 4Th semester	利兹学院 SWJTU-Leeds Joint School	
	晶体管和光电器件 Transistors and Optoelectronic Devices	限修 Distributional	6	2	第 5-6 学期 5Th -6Th semester	利兹学院 SWJTU-Leeds Joint School	
	通信原理 Communication Theory	限修 Distributional	6	1	第 5-6 学期 5Th -6Th semester	利兹学院 SWJTU-Leeds Joint School	
	电力电子技术 Power Electronics	限修 Distributional	3	1	第 5 学期 5Th semester	利兹学院 SWJTU-Leeds Joint School	
	电子电路设计 Electronic Circuit Design	限修 Distributional	3	2	第 5 学期 5Th semester	利兹学院 SWJTU-Leeds Joint School	
	控制系统 Control Systems	限修 Distributional	3	1	第 6 学期 6Th semester	利兹学院 SWJTU-Leeds Joint School	

专业核心课程 Specialized Core Course	高频电子技术 High Frequency Electronics	限修 Distributional	3	1	第 6 学期 6Th semester	利兹学院 SWJTU-Leeds Joint School	
	微处理器和可编程逻辑 Microprocessors and Programmable Logic	限修 Distributional	6	6	第 5-6 学期 5Th -6Th semester	利兹学院 SWJTU-Leeds Joint School	
	嵌入式系统项目 Embedded Systems Project	限修 Distributional	6	4	第 5-6 学期 5Th -6Th semester	利兹学院 SWJTU-Leeds Joint School	
	专业研究 Professional Studies	限修 Distributional	3	1	第 7 学期 7Th semester	利兹学院 SWJTU-Leeds Joint School	
	嵌入式系统 Embedded Systems	限修 Distributional	6	4	第 7 学期 7Th semester	利兹学院 SWJTU-Leeds Joint School	
	射频与微波工程 RF and Microwave Engineering	限修 Distributional	3	1	第 7 学期 7Th semester	利兹学院 SWJTU-Leeds Joint School	
	电力系统 Electric Power System	限修 Distributional	3	1	第 7 学期 7Th semester	利兹大学 University of Leeds	
	电机学 Electric Machines	限修 Distributional	3	1	第 8 学期 8Th semester	利兹学院 SWJTU-Leeds Joint School	
	集成电路设计 Integrated Circuit Design	限修 Distributional	3	1	第 8 学期 8Th semester	利兹学院 SWJTU-Leeds Joint School	
	数字通讯 Digital Communications	限修 Distributional	3	1	第 8 学期 8Th semester	利兹学院 SWJTU-Leeds Joint School	
实习实践教学 Practice Course 共 15 学分，其中必修 15 学分，限选 0 学分，任选 0 学分 A total credits of 15, including 15 for compulsory courses, 0 for distributional electives and 0 for free electives							
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践学分 In-class Practice Credits	开课学期 Semester	开课学院 School	备注 Notes
专业实践 Specialty Practices	数学应用与实践 Application and Practice of Mathematics	必修 Compulsory	0	0	短 1 学期 Short Semester 1	利兹学院 SWJTU-Leeds Joint School	
	工程训练 Engineering Training	必修 Compulsory	0	0	短 1 学期 Short Semester 1	利兹学院 SWJTU-Leeds Joint School	
	英语进阶 Advanced English	必修 Compulsory	0	0	短 2 学期 Short Semester 2	利兹学院 SWJTU-Leeds Joint School	
	电子工艺实习 Electronic Process Practice	必修 Compulsory	0	0	短 2 学期 Short Semester 2	利兹学院 SWJTU-Leeds Joint School	
	个性化工程实习项目 Personalized Engineering Practice Project	必修 Compulsory	0	0	短 3 学期 Short Semester 3	利兹学院 SWJTU-Leeds Joint School	

毕业设计 Graduation Design	毕业设计 Individual Engineering Project	必修 Compulsory	15	15	第 7-8 学期 7Th-8Th semester	利兹学院 SWJTU-Leeds Joint School	
附加环节 Additional Part 共 0 学分，其中必修 0 学分，限选 0 学分，任选 0 学分 A total credits of 0, including 0 for compulsory courses, 0 for distributional electives and 0 for free electives							
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践 学分 In-class Practice Credits	开课学期 Semester	开课学院 School	备注 Notes
跨学科课程 Interdisciplinary Courses	工程沟通与交流技巧 Engineering Communication Skills	必修 Compulsory	3	0	第 3-4 学期 3Rd -4Th semester	利兹学院 SWJTU-Leeds Joint School	不做毕业学分要求
	工程沟通与交流技巧 2 Engineering Communication Skills 2	必修 Compulsory	1.5	0	第 5-6 学期 5Th-6Th semester	利兹学院 SWJTU-Leeds Joint School	不做毕业学分要求
公共基础课程 Public Basic Courses 共 25 学分，其中必修 25 学分，限选 0 学分，任选 0 学分 A total credits of 25, including 25 for compulsory courses, 0 for distributional electives and 0 for free electives							
课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践 学分 In-class Practice Credits	开课学期 Semester	开课学院 School	备注 Notes
思想政治类 Ideological Politics Courses	思想道德修养与法律基础 The Ideological and Moral Cultivation and Legal Basis	必修 Compulsory	3	0.4	第 1 学期 1St semester	马院 School of Marxism	
	中国近现代史纲要 Conspectus of Chinese Modern History	必修 Compulsory	3	0.4	第 2 学期 2Nd semester	马院 School of Marxism	
	马克思主义基本原理 The Basic Principles of Marxism	必修 Compulsory	3	0.4	第 3 学期 3Rd semester	马院 School of Marxism	
	毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics	必修 Compulsory	3	0.4	第 5 学期 5Th semester	马院 School of Marxism	
	习近平新时代中国特色社会主义思想概论 Outline of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	必修 Compulsory	3	0.4	第 6 学期 6Th semester	马院 School of Marxism	
	形势与政策 I Situation and Policy I	必修 Compulsory	0	0	第 1 学期 1St semester	马院 School of Marxism	
	形势与政策 II Situation and Policy II	必修 Compulsory	0	0	第 2 学期 2Nd semester	马院 School of Marxism	

	形势与政策 III Situation and Policy III	必修 Compulsory	0	0	第 3 学期 3Rd semester	马院 School of Marxism	
	形势与政策 IV Situation and Policy IV	必修 Compulsory	0	0	第 4 学期 4Th semester	马院 School of Marxism	
	形势与政策 V Situation and Policy V	必修 Compulsory	0	0	第 5 学期 5Th semester	马院 School of Marxism	
	形势与政策 VI Situation and Policy VI	必修 Compulsory	0	0	第 6 学期 6Th semester	马院 School of Marxism	
	形势与政策 VII Situation and Policy VII	必修 Compulsory	0	0	第 7 学期 7Th semester	马院 School of Marxism	
	形势与政策 VIII Situation and Policy VIII	必修 Compulsory	2	0	第 8 学期 8Th semester	马院 School of Marxism	
军事类 Military Courses	军事理论 Military Theories	必修 Compulsory	2	0	第 1 学期 1St semester	武装部 Security Office	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short semester 1	武装部 Security Office	
体育类 Physical Education Courses	体育 I Physical Education I	必修 Compulsory	1	1	第 1 学期 1St semester	体育 School of Sports	
	体育 II Physical Education II	必修 Compulsory	1	1	第 2 学期 2Nd semester	体育 School of Sports	
	体育 III Physical Education III	必修 Compulsory	0.5	0.5	第 3 学期 3Rd semester	体育 School of Sports	
	体育 IV Physical Education IV	必修 Compulsory	0.5	0.5	第 4 学期 4Th semester	体育 School of Sports	
	体育健康课程 I Diversified Physical Education Courses I	必修 Compulsory	0.5	0.5	第 5 学期 5Th semester	体育 School of Sports	
	体育健康课程 II Diversified Physical Education Courses II	必修 Compulsory	0.5	0.5	第 6 学期 6Th semester	体育 School of Sports	
必修环节 A compulsory part 共 0 学分，其中必修 0 学分，限选 0 学分，任选 0 学分 A total credits of 0, including 0 for compulsory courses, 0 for distributional electives and 0 for free electives							

课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	总学分 Credits	课内实践 学分 In-class Practice Credits	开课学期 Semester	开课学院 School	备注 Notes
大学生综合素质提升、学生体质达标测评 Comprehensive Quality Improvement Courses for College Students、Assessment of Students' Physical Fitness	大学生综合素质提升（第二、第三课堂） Comprehensive Quality Improvement Courses for College Students (The Second and Third Classroom)	必修 Compulsory	0	0	1-8 学期 1-8 semester	校团委 Communist Youth League Committee	
	学生体质达标测评 Assessment of Students' Physical Fitness	必修 Compulsory	0	0	秋季学期 fall semester	体育 School of Sports	
学分总计 Total Credits			169 学分 169 Credits				