

电子信息工程专业辅修培养方案

Undergraduate Minor Studies Program of Electronic and Information Engineering

一、培养目标 Objectives

在学校“有社会担当和健全人格、有职业操守和专业才能、有人文情怀和科学素养、有历史眼光和全球视野、有创新精神和批判思维”（五有）人才培养总目标基础上，培养具有社会主义核心价值观，符合国家和轨道交通领域发展需求，具有轨道交通大工程背景，满足轨道交通智能化和信息化关键技术领域需要，以列车智能控制和智能运维为特色，具有扎实的数学、自然科学基础，机、电、控、信多元化知识结构，系统的电子信息工程专业知识、综合的工程实践和专业表达能力，能从事与轨道交通相关的电子设计、嵌入式系统开发、软件测试、装备运维或管理等工作的高素质复合型人才。

本专业学生在毕业 5 年左右，经过行业实践和自身学习能达到以下具体目标：

- 1) 具备社会责任感和使命感，坚守职业道德规范，在工程实践、科学研究中坚持国家和人民利益优先；
- 2) 能够通过多种学习方式提升专业持续发展能力，更新和调整专业知识和能力，以胜任电子信息工程行业技术的快速发展；
- 3) 具有创新思维，以及从事电子信息工程及应用领域产品研发、技术革新和工程科学研究的能力；
- 4) 能够应用专业以及职业相关的安全法规和专业技能，通过个人或者团队解决电子信息工程行业产品和装备生产中出现的问题，以提升产品和装备质量，并有利于改善环境促进可持续发展；
- 5) 能够主动参与工程行业和企事业单位的组织管理并担任一定的组织角色；
- 6) 能够开展跨学科跨文化学习，掌握新的知识和技能，拓展新的职业发展机会。

Based on the general objectives of professional cultivation: "Five Qualities" – social responsibility and sound personality, professional ethics and skills, humanity and scientific literacy, historical and global perspectives, innovative and critical thinking), the Programme aims to cultivate high caliber multidisciplinary talents with core

socialist values, satisfying national and rail transit development needs, especially the demands in the key technical sectors of rail transit intellectualization and informationization. Characterized by train intelligent control, operation and maintenance, the Programme requires the students to have solid foundation of mathematics and natural science, diversified knowledge structure of mechanical engineering, electronic engineering, control technology and information technology, acquire systematic knowledge of electronic information engineering, and develop abilities in integrated engineering practice and professional presentation. This Programme prepares them for occupations of electronic design, development of embedded system, software testing, equipment operation, maintenance or management related to rail transit in the future.

Through study and practice, students in the Programme shall achieve the following six goals in five years after graduation:

1. Have a sense of social responsibility and historical mission, stick to the professional norms, and always consider the national interests and peoples' interests as the first priority.

2. By a variety of learning methods such as engineer training to enhance professional sustainable development ability, update and adjust professional knowledge and ability, to be competent for the rapid development of electronic information engineering technology.

3. Have creative thinking, and the ability of product development, technology innovation and engineering scientific research in the field of electronic information engineering and application.

4. Apply professional and occupational safety regulations and professional skills to solve problems of equipment production in the field of electronic information engineering industry, so as to improve the quality of products and equipment, and to promote the environmental sustainability.

5. Actively participate and play a certain role in the organization and management of the engineering industry and enterprises.

6. Conduct interdisciplinary and cross-cultural learning, keep learning new technologies, expand opportunities to undertake new careers.

二、 培养要求 Requirement

毕业要求 1 工程知识: 具备数学、自然科学、电子信息基础和专业知识, 并能够将其用于描述、分析和解决电子信息工程领域的工程问题。

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

毕业要求 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工程问题, 以获得有效结论。

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

毕业要求 3 设计/开发解决方案: 能够设计针对电子信息工程领域的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。

Design/Development Solutions: To provide solutions to 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.

毕业要求 4 研究: 能够基于科学原理并采用科学方法对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。

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

毕业要求 5 使用现代工具: 能够针对电子信息工程领域的工程问题, 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, 包括对工程问题的预测与模拟, 并能够理解其局限性。

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

毕业要求 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。

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 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.

毕业要求 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工程问题的工程实践对环境、社会可持续发展的影响。

Environment and Sustainability: Ability to understand and evaluate the impact of engineering practice on environmental and social sustainable development of engineering problems in the field of electronic information engineering.

毕业要求 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。

Ethics: 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.

毕业要求 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。

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

毕业要求 10 沟通: 能够就电子信息工程领域相关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。

Communication: To be able to effectively communicate with colleagues from

industry and the public on 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.

毕业要求 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。

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

毕业要求 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。

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

三、学分要求 Credits Requirements

选本专业为辅修专业的学生应修学本专业的 43 学分核心必修课，并符合《西南交通大学本科生辅修专业修读及辅修学位授予管理办法》规定，方可颁发本专业辅修证书。

The students taking part in the minor studies of Electronic and Information Engineering should learn the main course with 43 credits and meet the requirements of “Measures for the administration of undergraduate minor studies and minor degree awarding in Southwest Jiaotong University” before receiving the certificate.

四、课程设置 Course Programs

课程类型 Course Type	课程名称 Course Name	课程性质 Nature of Course	学分 Credits	开课学期 Semester	开课学院 School	备注 Notes
学科基础课程 必修 8 学分	信号与系统 (含实验) Signals and Systems (Including Experiments)	必修 Compulsory	3	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
	数据结构 (含实验) Data structure	必修 Compulsory	2.5	秋季学期 Fall Semester	电气工程学院 School of Electrical Engineering	
	程序设计基础 Fundamentals of Programming	必修 Compulsory	2.5	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
专业核心课 必修 31 学分	自动控制原理 (含实验) Principles of Automatic Control (Including Experiments)	必修 Compulsory	4	秋季学期 Fall Semester	电气工程学院 School of Electrical Engineering	
	微机原理 (含实验) Principles of Micro-Computer	必修 Compulsory	4	秋季学期 Fall Semester	电气工程学院 School of Electrical Engineering	
	电子测量技术 (含实验) Electronic Measurement Technology (Including Experiments)	必修 Compulsory	2.5	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
	通信原理 (含实验) Communication Theory (Including Experiments)	必修 Compulsory	3	秋季学期 Fall Semester	电气工程学院 School of Electrical Engineering	
	数字信号处理 (含实验) Digital Signal Processing (Including Experiments)	必修 Compulsory	3	秋季学期 Fall Semester	电气工程学院 School of Electrical Engineering	
	信息论与编码 Information Theory and Coding	必修 Compulsory	2	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
	计算机网络 (含实验) Computer Networks	必修 Compulsory	3	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
	通信电路 Communication Circuits	必修 Compulsory	2	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
	嵌入式系统及应用(含实验) Embedded System and Its Application	必修 Compulsory	3	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	

	软件综合设计（含实验） Software Comprehensive Experiments	必修 Compulsory	2	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
	MCU 系统综合实验 MCU System Comprehensive Experiments	必修 Compulsory	2.5	春季学期 Spring Semester	电气工程学院 School of Electrical Engineering	
专业实践课 必修 4 学分	综合设计 Comprehensive Design	必修 Compulsory	4	秋季学期 Fall Semester	电气工程学院 School of Electrical Engineering	
总学分 Total Credits			43			