微电子科学与工程专业培养方案

Undergraduate Program of Microelectronics Science and Engineering

I.专业介绍 Introduction

微电子科学与工程专业是国家战略性新兴专业和国家战略需求与区域经济社会发展所需紧缺人才专业。本专业依托西南交大电子科学与技术四川省重点学科、电气工程国家级教学实验示范中心、西南交大微电子研究所、智能传感器与微系统实验室、微电子技术实验室，并同英特尔、赛灵思等公司建立了联合实验室。近年来本专业学生考取（或保送）国内外著名高校研究生比例高。毕业生工作适应能力强，就业领域宽，就业单位涵盖国内外著名集成电路和电子信息领域骨干企业。

Microelectronics Science and Engineering is a national strategic emerging major, and national strategic needs and the shortage of talents required by regional economic and social development. This major relies on the Electronic Science and Technology key discipline of Sichuan Province, the National Teaching and Experimental Demonstration Center of Electrical Engineering, the Institute of Microelectronics of SWJTU, the Laboratory of Intelligent Sensors and Microsystems, and the Microelectronics Technology Laboratory. This major has established joint laboratories with Intel, Xilinx and other companies. In recent years, students of this major have obtained (or guaranteed) a high proportion of graduates from famous universities at home and abroad. Graduates have strong work adaptability and wide employment fields, and the employment units cover well-known key enterprises in the field of integrated circuits and electronic information at home and abroad.

专业代码：080704

Program Code: 080704

专业名称：微电子科学与工程

Program Name: Microelectronics Science and Engineering

II.培养目标 Objectives

本专业旨在培养德、智、体、美、劳全面发展，具有扎实的数理基础，熟悉电子信息基本理论及应用技术，掌握新型微电子器件与现代集成电路设计与制造技术，具有电子材料、器件、电路与系统的设计及应用开发能力，具有较好的外语运用能力和良好的团队协作与交流能力，适应国家集成电路产业发展战略的具有国际视野的研究型与工程型高级技术人才。毕业后，可在微电子技术相关学科领域从事产品开发、技术管理、工程设计、教学科研等工

作，并具有在工作中继续学习、不断更新知识的能力。

毕业生经过实践锻炼，能够达到以下目标：

（1）熟悉职业相关的国家法律法规，具备良好道德修养、人文素质、职业素养和社会责任感，能积极服务国家和社会。

（2）针对实际需求，能运用自然科学、工程基础和微电子科学与工程专业知识，对复杂电子电路和集成电路系统工程问题进行分析，研究解决方案，承担集成电路系统的设计、开发和应用管理任务。

（3）具有与业界同行、专业客户和公众进行有效沟通的能力，能有效进行团队合作，并具备相应的组织与管理能力。

（4）有能力通过继续教育或其它学习渠道持续学习，更新知识实现能力提升，能适应技术和职业发展需求。

Microelectronics Science and Engineering major of Southwest Jiaotong University aims to train innovative, research and engineering senior technical talents have the following features: familiar with basic theory and application of electronic information technology, with solid mathematical and physical foundation, familiar with basic theory and application of electronic information technology, master manufacturing technology of modern integrated circuit design and microelectronic device, have the application and development ability of electronic materials, devices, circuits and systems design, have good foreign language skills and good teamwork spirit and communication skills, with international vision that adapts to the development strategy of the national integrated circuit industry. After graduation, they can engage in product development, technology management, engineering design, teaching and scientific research in the field of Electronic Science and technology, especially in the field of microelectronics related disciplines, and have the ability to continue learning and constantly update knowledge in their work.

The graduates are expected to:

(1) Familiar with professional laws and regulations, with good moral cultivation, humanistic quality, professionalism and social responsibility, and can actively serve the country and society.

(2) Possess the ability of using natural science, engineering and computer knowledge to analyze complex computer system engineering problems, research solutions, and undertake the tasks like designing, developing and managing computer system.

(3) Communicate effectively with industry peers, professional customers and society at large and work harmoniously in teamwork; and have ability of corresponding organization and management capabilities.

(4) Have ability to continuously learn through continuing education or other learning channels to update knowledge, improve ability, and to adapt to technical and professional development needs.

III. 专业毕业要求 Graduation Requirements

微电子科学与工程实行弹性学制，学制 4-6 年，允许学生在取得规定的 160 学分后提前毕业，也允许延长学习年限，但一般不超过六年。

学生修完本专业培养计划规定的课程及教学实践环节，取得规定的学分，德、智、体考核合格，总学分不少于 160 学分，满足以下毕业要求，按照《中华人民共和国学位条例》规定的条件授予工学学士学位。

对于本专业的学生，毕业要求包括如下 12 项基本要求：

（1）工程知识：掌握从事微电子科学与工程领域工作所需要的数学、自然科学、工程基础和专业知识，并能够运用这些知识解决复杂微电子工程问题；

（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微电子科学与工程领域复杂工程问题，以获得有效结论；

（3）设计/开发解决方案：能够设计针对复杂工程问题的解决方案，设计满足特定需求的芯片与元器件、硬件部件和软件，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：具有基于科学原理并采用科学方法对微电子工程问题进行研究的能力，包括设计与实施实验、分析与解释数据、并通过信息综合得到合理有序的结论；

（5）使用现代工具：能够选择与使用恰当的技术、资源、现代工程开发工具和信息技术工具，对微电子工程问题进行设计、模拟与实现，并能够理解其局限性；

（6）工程与社会：在微电子工程问题解决方案的设计和实现过程中，能够根据具体的工程背景合理分析和评价其对社会、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：在微电子工程问题解决方案的设计和实现过程及系统运行中能够理解和评价其对环境、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：具有一定的组织管理能力、团队合作能力，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；

（10）沟通：能够就复杂系统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和跨文化沟通交流能力；

（11）项目管理：理解并掌握工程管理原理与经济决策方法，具有在多学科环境中应用的能力；

（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。

The major of Microelectronics Science and Engineering implements a flexible academic

system with 4-6 years. Students are allowed to graduate in advance after obtaining the required 160 credits. It is also allowed to extend the length of study, but generally does not exceed six years.

In accordance with the "Degree Regulations of People's Republic of China", students will be awarded to a bachelor's degree in engineering after achieving the following goals: completing the courses and practice parts specified in the professional talent cultivation program, obtaining not less than the required 160 credits, passing the moral, intellectual and physical examinations, and meeting the following graduation requirements.

For students in this major, the graduation requirements include the following 12 items:

1. Engineering Knowledge: Master the knowledge of mathematics, natural science, and engineering fundamentals required for work in the area of Microelectronics Science and Engineering, with expertise in microelectronics technology, and apply these knowledges to solve complex engineering problems in the area of microelectronics.

2. Problem Analysis: Ability to apply the first principles of mathematics, natural sciences, and engineering sciences to identify, formulate, and analyze complex engineering problems in the area of Microelectronics Science and Engineering technology; obtain relevant information through literature researches and data queries to analyze engineering problems of Microelectronics Science and Engineering technology to reach substantiated conclusions.

3. Design/development of solutions: Ability to design solutions for complex engineering problems in the area of microelectronics technology, and to design microelectronics technology modules or systems that meet specified needs with sense of innovation and with appropriate considerations for society, health, safety, law, culture, environment, etc.

4. Investigation: Ability to conduct investigations of complex problems in microelectronics technology, based on scientific principles and methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

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

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

7. Environment and Sustainability: Understand the guidelines, policies, laws and regulations on environmental protection and sustainable development in the microelectronics technology, and understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

8. Occupational norms: have humanistic and social science literacy as well as social responsibility, understand and comply with engineering professional ethics and norms in engineering practice and fulfill responsibilities.

9. Individual and Team work: Function effectively in teamwork as an individual, and as a member or leader in engineering project or technical development teams in multi-disciplinary settings.

10. Communication: can communicate effectively over complicated engineering problems with both industry peers and the general public, including writing reports, designing documents, giving presentations, clearly presenting or responding to instructions; can see into problems in an international perspective and communicate with people of different cultural backgrounds.

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

12. Lifelong learning: have the consciousness of independent learning and lifelong learning and the ability of continuous learning and adapting to development

The above 12 graduation requirements support the various parts of the professional training objectives. The supporting relationship matrix is shown in the following table:

毕业要求对培养目标的支撑关系

The Support Relationship of Graduation Requirements for Cultivation Objectives

毕业要求 **Graduation Requirements**	**培养目标** **Training Objectives**			
	目标 1 **Objective 1**	**目标 2** **Objective 2**	**目标 3** **Objective 3**	**目标 4** **Objective 4**
毕业要求 1：工程知识 1.Engineering Knowledge		√		√
毕业要求 2：问题分析 2. Problem Analysis		√		
毕业要求 3：设计/开发解决方案 3. Design/development of solutions		√		
毕业要求 4：研究 4. Investigation		√		√
毕业要求 5：使用现代工具 5. Modern Tool Usage		√		√
毕业要求 6：工程与社会 6. The Engineer and Society	√			
毕业要求 7：环境和可持续发展 7. Environment and Sustainability	√			
毕业要求 8：职业规范 8. Ethics	√			
毕业要求 9：个人和团队 9. Individual and Team work	√		√	
毕业要求 10：沟通 10. Communication	√		√	
毕业要求 11：项目管理 11. Project Management and Finance		√	√	
毕业要求 12：终身学习 12. Lifelong learning				√

IV.学制与学位 Duration and Degree

学制：四年

Duration: Four years

学位：工学学士

Degree: Bachelor of Engineering

V.主干学科与主干课程 Main Subject and Main Course

主干学科：电子信息

Main Subject： Electronic Information

主干课程：现代半导体器件、集成电路工艺、模拟集成电路分析与设计基础、模拟集成电路分析与设计基础实验、数字集成电路分析与设计基础、数字集成电路分析与设计基础实验、SoC 设计方法、SoC 设计方法实验、数字信号处理。

Main Course： Modern Semiconductor Devices, Integrated Circuit Process, Fundamentals of Analog Integrated Circuit Analysis and Design , Experiment of Fundamental Analog Integrated Circuits Analysis and Design, Fundamentals of Digital Integrated Circuit Analysis and Design, Experiment of Fundamentals of Digital Integrated Circuit Analysis and Design, SoC Design Methodology, Experiment of SoC Design Methodology, Digital Signal Processing.

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

本专业毕业学分最低要求：160 学分，具体学分规定如下表

课程体系 Curriculum System		学分要求 Credits Requirements						
		必修 Compulsory		限修 Distributional Electives		选修 Free Electives		小计 Subtotal
		理论 Theory	实践 Practice	理论 Theory	实践 Practice	理论 Theory	实践 Practice	
公共基础课程 Public Basic Courses	思想政治类 Ideological Politics Courses	14	2					16
	军事类 Military Courses	2	2					4
	外语类 Foreign Language Courses	6		2				8
	体育类 Physical Education Courses		4					4
通识教育课程 General Education Courses	核心通识课 Core General Education Courses			4				4
	新生研讨课 Freshman Seminar			2				2

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	26	2					28
	专业基础课 Professional Foundational Courses	32	6					38
专业课程 Specialized Courses	专业核心课程 Specialized Core Course	16.5	4.5					21
	专业限修课程 Specialized Restricted Courses			12				12
实习实践教学 Practice Courses	基本技能训练、实习实训、综合课程设计、社会与文化素质实践、毕业实习与毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design		16					16
多元化课程 Diversified Courses	跨学科课程、美育专业类课程、学科竞赛类课程、其它个性化选修课程等 Interdisciplinary Courses, Aesthetic Education Courses, Subject Competition Courses, other Personalized Elective Courses, etc			2	3			5
创新创业实践 Innovation and Entrepreneurship Practice	创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等 Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc		2					2

必修环节 A 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
总　计 Total								**160**

VII.课程设置细化表 Course Programs Table

公共基础课程 Public Basic Courses 共 32 学分，其中必修 30 学分，限修 2 学分，选修 0 学分 A total credits of 32，including 30 for compulsory courses，2 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**	**支撑毕业要求指标点 Indicators which Support Graduation Requirements**	**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	马克思主义学院 School of Marxism	6,7,8	
	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	马克思主义学院 School of Marxism	7,8	
	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	马克思主义学院 School of Marxism	8	
	毛泽东思想和中国特色社会主义理论体系概论 I Introduction to Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics I	必修 Compulsory	3	0.4	第 5 学期 5Th Semester	马克思主义学院 School of Marxism	6,7,8	
	毛泽东思想和中国特色社会主义理论体系概论 II Introduction to Mao Zedong Thought and theoretical System of Socialism with Chinese Characteristics II	必修 Compulsory	2	0.4	第 6 学期 6Th Semester	马克思主义学院 School of Marxism	6,7,8	
	形势与政策 I Situation and Policy I	必修 Compulsory	0	0	第 1 学期 1St Semester	马克思主义学院 School of Marxism	6,7,8	
	形势与政策 II Situation and Policy II	必修 Compulsory	0	0	第 2 学期 2Nd Semester	马克思主义学院 School of Marxism		
	形势与政策 III Situation and Policy III	必修 Compulsory	0	0	第 3 学期 3Rd Semester	马克思主义学院 School of Marxism		
	形势与政策 IV Situation and Policy IV	必修 Compulsory	0	0	第 4 学期 4Th Semester	马克思主义学院 School of Marxism		
	形势与政策 V Situation and Policy V	必修 Compulsory	0	0	第 5 学期 5Th Semester	马克思主义学院 School of Marxism		

思想政治类 Ideological Politics Courses	形势与政策 VI Situation and Policy VI	必修 Compulsory	0	0	第 6 学期 6Th Semester	马克思主义学院 School of Marxism	6,7,8	
	形势与政策Ⅶ Situation and Policy Ⅶ	必修 Compulsory	0	0	第 7 学期 7Th Semester	马克思主义学院 School of Marxism		
	形势与政策Ⅷ Situation and Policy Ⅷ	必修 Compulsory	2	0	第 8 学期 8Th Semester	马克思主义学院 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	9	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short Semester 1	武装部 Security Office	9，10	
外语类 Foreign Language Courses	英语 I College English I	必修 Compulsory	2	0	第 1 学期 1St Semester	外国语学院 School of Foreign languages	10	
	英语 II College English II	必修 Compulsory	2	0	第 2 学期 2Nd Semester	外国语学院 School of Foreign languages	10	
	通用学术英语 English for General Academic Purposes	必修 Compulsory	2	0	第 3 学期 3Rd Semester	外国语学院 School of Foreign languages	10	
	职场英语 Workplace English	限修 Distributional Elective	2	0	第 4 学期 4Th Semester	外国语学院 School of Foreign languages	10	限选 1 门，2 学分 Limited to 1 course, 2 credits
	交际与文化视听说 Viewing, Listening & Speaking in English --Communication & Culture							
	语言、文化与翻译 Language, Culture and Translation							
	英语公共演讲 Public Speaking in English							
体育类 Physical Education Courses	体育 I Physical Education I	必修 Compulsory	1	1	第 1 学期 1St Semester	体育部 Dept. of Physical Education	9，10	
	体育 II Physical Education II	必修 Compulsory	1	1	第 2 学期 2Nd Semester	体育部 Dept. of Physical Education		
	体育 III Physical Education III	必修 Compulsory	0.5	0.5	第 3 学期 3Rd Semester	体育部 Dept. of Physical Education		
	体育 IV Physical Education IV	必修 Compulsory	0.5	0.5	第 4 学期 4Th Semester	体育部 Dept. of Physical Education		
	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	体育部 Dept. of Physical Education	6	
	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	体育部 Dept. of Physical Education		
通识教育课程 **General Education Courses** 共 6 学分，其中必修 2 学分，限修 4 学分，选修 0 学分 A total credits of 6，including 2 for compulsory courses，4 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**	**支撑毕业要求指标点 Indicators which Support Graduation Requirements**	**备注 Notes**

核心通识课 Core General Education	“交通天下”通识课程 General Studies on Transportation	限修 Distributional Elective	4		第 2-8 学期 2-8 Semester		6，7，8	
新生研讨课 Freshman Seminar	通信学科前沿导论 Introduction on the Frontier of Communication Discipline 微电子学科前沿导论 Introduction on the Frontiers of Microelectronics 轨道交通控制 Rail Transit Control	限修 Distributional Electivey	2		第 1 学期 1St Semester	信息科学与技术学院 School of Information Science and Technology	2，5，8，9，10，12	限选 1 门，2 学分 Limited to 1 course, 2 credits
学科与专业基础课程 Discipline and Specialty foundational Courses 共 66 学分，其中必修 66 学分，限修 0 学分，选修 0 学分 A total credits of 66，including 66 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**	**支撑毕业要求指标点 Indicators which Support Graduation Requirements**	**备注 Notes**
数学与自然科学基础课 Foundational Courses on Mathematics and Natural Science	高等数学 I Advanced Mathematics I	必修 Compulsory	5		第 1 学期 1St Semester	数学学院 School of Mathematics	1	
	线性代数 B Linearity Algebra B	必修 Compulsory	3		第 1 学期 1St Semester	数学学院 School of Mathematics	1	
	高等数学 II Advanced Mathematics II	必修 Compulsory	5		第 2 学期 2Nd Semester	数学学院 School of Mathematics	1	
	概率与数理统计 probability and mathematical statistics	必修 Compulsory	3		第 3 学期 3Rd Semester	数学学院 School of Mathematics	1,2	
	数理方程 B Equations of Mathematical Physics B	必修 Compulsory	2		第 4 学期 4Th Semester	数学学院 School of Mathematics	1	
	大学物理 AI University Physics AI	必修 Compulsory	4	0	第 2 学期 2Nd Semester	物理科学与技术学院 School of Physics	1	
	大学物理实验 I University Physics I	必修 Compulsory	1	1	第 2 学期 2Nd Semester	物理科学与技术学院 School of Physics	1，4	
	大学物理 AII Experiments of University Physics AII	必修 Compulsory	4	0	第 3 学期 3Rd Semester	物理科学与技术学院 School of Physics	1	
	大学物理实验 II Experiments of University Physics II	必修 Compulsory	1	1	第 3 学期 3Rd Semester	物理科学与技术学院 School of Physics	1，4	
专业基础课 Professional Foundational Courses	高级语言程序设计 Advanced language programming	必修 Compulsory	4	0.5	第 1 学期 1St Semester	信息科学与技术学院 School of Information Science and Technology	1，2，3，4，5	
	电路分析 BI Circuit Analysis BI	必修 Compulsory	3	0.25	第 2 学期 2Nd Semester	电气工程学院 School of Electrical Engineering	1,2	

专业基础课 Professional Foundational Courses	电路分析 BII Circuit Analysis BII	必修 Compulsory	3	0.25	第 3 学期 3Rd Semester	电气工程学院 School of Electrical Engineering	1,2	
	数字逻辑与计算机组成原理 Digital Logic and Computer Composition Principle	必修 Compulsory	4.5		第 3 学期 3Rd Semester	信息科学与技术学院 School of Information Science and Technology	1,2,3	
	数字逻辑与计算机组成原理实验 Experiments of Digital Logic and Computer Composition Principle	必修 Compulsory	1.5	1.5	第 3 学期 3Rd Semester	信息科学与技术学院 School of Information Science and Technology	3,5,7	
	信号与系统 A Signal and System A	必修 Compulsory	4	0.5	第 4 学期 4Th Semester	信息科学与技术学院 School of Information Science and Technology	1,2,4	
	模拟电子技术 Analog electronic technology	必修 Compulsory	4		第 4 学期 4Th Semester	信息科学与技术学院 School of Information Science and Technology	1,2	
	模拟电子技术实验 Experiments of Analog Electronic Technique	必修 Compulsory	1	1	第 4 学期 4Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4,5	
	通信电路 communication Circuit	必修 Compulsory	3		第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	1,2	
	通信电路实验 Experiments of communication Circuit	必修 Compulsory	1	1	第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4,5	
	电磁场与电磁波 Electromagnetic Field and Wave	必修 Compulsory	4		第 6 学期 6Th Semester	物理科学与技术学院 School of Physics	1,6	
	电子设计自动化（EDA） Electronic Design Automation	必修 Compulsory	2	1	第 4 学期 4Th Semester	信息科学与技术学院 School of Information Science and Technology	1,5,11	
	半导体物理 Semiconductor Physics	必修 Compulsory	3		第 4 学期 4Th Semester	物理科学与技术学院 School of Physics	1,2	
专业课程 **Specialized Courses** 共 33 学分，其中必修 21 学分，限修 12 学分，选修 0 学分 A total credits of 33，including 21 for compulsory courses，12 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	支撑毕业要求指标点 Indicators which Support Graduation Requirements	备注 Notes
专业核心课程 Specialized Core Course	现代半导体器件 Modern semiconductor devices	必修 Compulsory	3		第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	1,3	
	集成电路工艺 Integrated Circuit Process	必修 Compulsory	2		第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	2,3	
	模拟集成电路分析与设计基础 I Fundamentals of Analog Integrated Circuit Analysis and Design I	必修 Compulsory	2		第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	2,6,11	
	模拟集成电路分析与设计基础实验 I Experiment of Fundamental Analog Integrated Circuits Analysis and Design I	必修 Compulsory	1	1	第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4	
	模拟集成电路分析与设计基础 Ⅱ Fundamentals of Analog Integrated Circuit Analysis and Design Ⅱ	必修 Compulsory	2		第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	2,6,11	
	模拟集成电路分析与设计基础实验Ⅱ Experiment of Fundamental Analog Integrated Circuits Analysis and Design Ⅱ	必修 Compulsory	1	1	第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4	
	数字集成电路分析与设计基础 Fundamentals of Digital Integrated Circuit Analysis and Design	必修 Compulsory	3		第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	2,6,12	
	数字集成电路分析与设计基础实验 Experiment of Fundamentals of Digital Integrated Circuit Analysis and Design	必修 Compulsory	1	1	第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4	
	SoC 设计方法 SoC Design Methodology	必修 Compulsory	2		第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4,5	

专业核心课程 Specialized Core Course	SoC 设计方法实验 Experiment of SoC Design Methodology	必修 Compulsory	1	1	第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	4,5	
	数字信号处理 A Digital Signal Processing A	必修 Compulsory	3	0.5	第 5 学期 5Th Semester	信息科学与技术学院 School. of Information science and technology	2,4	
专业限修课程 Specialized Restricted Courses	微波集成电路 Microwave Integrated Circuit	限修 12 学分 Distributional Elective 12 Credits	3	0.5	第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	1,2,3	
	电子信息材料与器件 Microelectronics Information and Device		2		第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	1,3	
	功率半导体器件与电路 Power Semiconductor Device and Circuit		2		第 6 学期 6Th Semester	信息科学与技术学院 School of Information Science and Technology	1,3	
	嵌入式系统设计与应用 Embedded System Design and Application		2		第 4 学期 4Th Semester	信息科学与技术学院 School of Information Science and Technology	1,2,11	两个必须一起选
	嵌入式系统设计与应用实验 Experiment of Embedded System Design and Application		1	1	第 4 学期 4Th Semester	信息科学与技术学院 School of Information Science and Technology	4,5	
	单片机原理及应用 Principles and Applications of Microcomputer		3	1	第 4 学期 4Th Semester	信息科学与技术学院 School. of Information science and technology	3,5	
	通信原理 Communication theory		3		第 5 学期 5Th Semester	信息科学与技术学院 School of Information Science and Technology	1,2,4	
	数据结构 B Data structure		3	1	第 2 学期 2Nd Semester	信息科学与技术学院 School of Information Science and Technology	1,2,3	
	机器学习 A machine learningA		3		第 6 学期 6Th semester	信息学院 School of Information Science and Technology	2，3，4，5	
实习实践教学 Practice Course 共 16 学分，其中必修 16 学分，限修 0 学分，选修 0 学分 A total credits of 16，including 16 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	支撑毕业要求指标点 Indicators which Support Graduation Requirements	备注 Notes
基本技能训练、实习实训、综合课程设计、社会与文化素质实践、毕业实习与毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design	集成电路综合设计 Comprehensive design of Integrated Circuits	必修 Compulsory	2	2	第 7 学期 7Th Semester	信息科学与技术学院 School of Information Science and Technology	3,4,5,6,10,11,12	
	工程训练 A Engineering Training A	必修 Compulsory	2	2	短 1 学期 Short Semester 1	工程训练中心 Center of Engineering Training	5,7,8,12	
	电子工艺实习 Electronic Process Practice	必修 Compulsory	1	1	短 2 学期 Short Semester 2	信息科学与技术学院 School of Information Science and Technology	5,6,7,8,10	
	电子技术课程设计 Electronic Technology Curriculum Design	必修 Compulsory	1	1	短 2 学期 Short Semester 2	信息科学与技术学院 School of Information Science and Technology	3,4,5,6,9,10,11,12	
	微电子科学与工程专业工程实习 Engineering Practice of Microelectronics Science and engineering	必修 Compulsory	2	2	短 3 学期 Short Semester 3	信息科学与技术学院 School of Information Science and Technology	6,7,8,9,12	
	毕业设计 B Graduation Project B	必修 Compulsory	8	8	第 8 学期 8Th Semester	信息科学与技术学院 School of Information Science and Technology	2,3,4,5,12	
多元化课程 Diversified course 共 5 学分，其中必修 0 学分，限修 5 学分，选修 0 学分 A total credits of 5，including 0 for compulsory courses，5 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**	**支撑毕业要求指标点 Indicators which Support Graduation Requirements**	**备注 Notes**
跨学科课程 Interdisciplinary Courses	智能设计与制造 Intelligent design and manufacture	限修 5 学分 Distributional Elective 5 Credits	2	2	短 2 学期 Short Semester 2	信息科学与技术学院 School of Information Science and Technology	3,4,6,7,9，12	按照《西南交通大学多元化课程修读指导手册》执行。

跨学科课程 Interdisciplinary Courses	数字图像背后的秘密 Secrets Behind Digital Images	限修 5 学分 Distributional Elective 5 Credits	3	1	第 7 学期 7Th Semester	信息科学与技术学院 School of Information Science and Technology	3,6,7,8,10	Study in accordance with the Regulations on Credit Recognition and Management of Diversified course in Southwest Jiaotong University
	程序设计之美 Beauty of Programming		2		6 学期 6th Semester	信息科学与技术学院 School of Information Science and Technology	6, 7, 9	
	智能+交通 Intelligence + Transportation		2	0	第 7 学期 7Th Semester	信息科学与技术学院 School of Information Science and Technology	3,6,7,8,10	
	研究能力训练课程设计 Research Ability Training		1	1	第 7 学期 7Th Semester	信息科学与技术学院 School of Information Science and Technology	3,6,7,8,10	
美育专业类课程 Aesthetic Education Specialty Courses	全校美育专业类课程 Aesthetic Education Specialty Courses of University		2		2-8 学期 2-8 Semester	全校 The whole school	8，12	
学科竞赛类课程 Subject Competition Courses	全校学科竞赛课程 Subject Competition Courses of University		2	2	2-8 学期 2-8 Semester		3,4,6,7,9	
个性化选修课程 Personalized Elective Courses	全校个性化选修课程 Personalized Elective Courses of University		2		2-8 学期 2-8 Semester		8，12	

创新创业实践
Innovation and Entrepreneurship Practice
共 2 学分，其中必修 2 学分，限修 0 学分，选修 0 学分
A total credits of 2，including 2 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**	**支撑毕业要求指标点 Indicators which Support Graduation Requirements**	**备注 Notes**
创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等 Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject	课外创新实践 Practice on Innovative Extra-curriculum Activities	必修 Compulsory	2	2	3-7 学期 3-7 Semester	信息科学与技术学院 School of Information Science and Technology	9	按照《西南交通大学创新实践学分认定与管理办法》规定修习 Study in accordance with the Regulations on Credit Recognition and Management of

Competition, Innovation Lectures, etc								Innovation Practice in Southwest Jiaotong University
必修环节 **Compulsory part** 共 0 学分，其中必修 0 学分，限修 0 学分，选修 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**	**支撑毕业要求指标点 Indicators which Support Graduation Requirements**	**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	第 1 学期 1St Semester	校团委 Communist Youth League Committee	12	
	学生体质达标测评 Assessment of Students' Physical Fitness	必修 Compulsory	0	0	第 1 学期 1St Semester	体育部 Dept. of Physical Education	12	
学分总计 Total Credits			**160**					