

电气工程及其自动化专业培养方案

Undergraduate Program of Electrical Engineering and Its Automation

I.专业介绍 Introduction

西南交通大学电气工程学院电气工程及其自动化专业一直致力于面向轨道交通发展需要，服务“高铁走出去”和“一带一路”国家战略，培养国家建设需要的电气工程复合型卓越人才与创新人才，建设交通特色鲜明的国家一流专业。

其前身为中国科学院曹建猷院士等于 1952 年创办的我国第一个电气运输专业，1962 年发展为电气化铁道供电和电力机车，后更名为铁道电气化和电力牵引与传动控制，1996 年根据国家教育教学改革大类培养要求，将上述两专业纳入“电气工程及其自动化”专业。目前本专业下设轨道交通供电及其自动化、电力系统及其自动化、电力电子与传动控制、城轨与磁浮交通电气化和功率半导体器件及应用五个专业方向。

本专业于 2007 年获评首批“国家级特色专业”，2010 年入选首批国家“卓越工程师培养计划”，2012 年入选首批“国家级专业综合改革试点——国家重点专业”；拥有国家级教学名师、国家级教学团队、国家和省部级精品课程以及国家级规划教材，建设有国家级实验教学示范中心、国家级虚拟仿真实验教学中心以及国家级工程实践教育中心等教学实践基地；获得了包括国家级教学成果一、二等奖在内的多项国家和省级教学成果奖；2008 年、2014 年和 2017 年本专业连续三次通过中国工程教育专业认证。

本专业毕业生主要就业于轨道交通行业和电力行业，可在轨道交通、电力系统或工业自动化等领域，从事工程/产品设计、技术开发、工程施工/试验、产品制造/测试、运营维护、技术管理、教学科研等方面工作。本专业毕业生社会需求量大，就业前景好，就业率连续多年保持 99.5%以上，升学率达到 45%。

As the specialty of the school of electrical engineering in Southwest Jiaotong University, Electrical engineering and its automation has been committed to cultivate outstanding talents and creative talents to satisfy the requirement of national electrical engineering construction, meanwhile constructing the national first-class specialty with traffic characteristic for the development of the rail transit oriented, "the high-speed rail go out" and "The Belt and Road" national strategy.

Its predecessor was the first electrical transport in our country founded by academician of Chinese academy of sciences Cao Jianyou in 1952. In 1962, it was developed as the electrified railway power supply and electric locomotives, which was later renamed as the railway electrification and electric traction and drive control. In 1996, according to the requirements of national education and teaching reform, the above two majors were incorporated into "electrical engineering and automation". At present, there are five major directions in this specialty: Rail Transit Automation and Power Supply, Power system and its automation, Power electronics and drive control, Urban rail and maglev electrification, and Power semiconductor devices and applications.

In 2007, the specialty was selected as one of the first batch of "national characteristic specialties". In 2010, it was selected as one of the first batch of national "excellent engineer training

program". In 2012, it was selected as one of the first batch of "national comprehensive professional pilot reform -- national key specialties". It has own national famous teachers, national teaching team, national and provincial excellent courses, and national planned teaching materials. It has built teaching practice bases such as "national experimental teaching demonstration center", "national virtual simulation experimental teaching center" and "national engineering practice education center". It has won a number of national and provincial teaching achievements awards, including the first and second prizes of national teaching achievements. In 2008, 2014 and 2017 separately, this major has been certified by China Engineering Education Association for three consecutive times.

Graduates of this major are mainly employed in the rail transit industry and electric power industry. They are normally engaged in engineering/product design, technology development, engineering construction/test, product manufacturing/test, operation and maintenance, technical management, teaching and scientific research and other aspects in the fields of rail transit, electric power system or industrial automation. The graduates of this major have great social demand and good employment prospects. The employment rate has remained above 99.5% for many years, and the enrolment rate has reached 45%.

专业代码: 080601

Program Code:080601

专业名称: 电气工程及其自动化

Program Name: Electrical Engineering and Its Automation

II.培养目标 Objectives

面向国家轨道交通与电力系统需求, 培养人格健全, 人文素养和职业道德优良, 理论和工程基础扎实, 具有自主学习能力和国际化视野的高素质创新人才。本专业毕业生在轨道交通、电力系统或工业自动化等相关领域就业, 或进入研究生阶段深造, 经过五年的深造和实践锻炼, 预期达到以下目标:

- 1.具备分析与解决电气工程及其自动化领域的复杂工程、前沿技术或经营管理中的问题的能力, 成为具有独立工作和团队协作能力的工程师或技术管理人员;
- 2.完成电气工程以及自动化相关领域的研究生教育, 成为具有科技创新、装备研发和组织领导能力的工程技术人员、教育工作者或管理者;
- 3.具有正确的人生观, 高度的社会责任感和使命感, 与良好的人文素养。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;
- 4.拥有全球化意识和国际视野, 不断更新和提升专业知识与技能, 在工程实践中体现较强的人际沟通、团队协作、组织管理能力, 能积极主动适应不断变化的国内外形势和环境, 参与国际合作与竞争。

To satisfy the needs of the national rail transit and power system, it aims to cultivate high-quality innovative talents with sound personality, excellent humanistic quality and professional ethics, solid theoretical and engineering foundation, independent learning ability and international vision. Graduates of this major are employed in rail transit, power system or industrial automation and other related fields, or enter the postgraduate stage for further study. After five years of further study and practice, the following goals are expected to be achieved:

1. Have the ability to analyze and solve complex engineering, cutting-edge technology or

management problems in the field of electrical engineering and automation, and become an engineer or technical manager with independent working and teamwork ability;

2. Complete graduate education in electrical engineering and automation related fields, and become an engineering technician, educator or manager with scientific and technological innovation, equipment research and development and organizational leadership ability;

3. Have a correct outlook on life, a high sense of social responsibility and mission, and good humanistic quality. Adhere to the code of professional ethics and give priority to the interests of the nation and the people in engineering practice and scientific research;

4. Have global awareness and international vision, constantly update and improve professional knowledge and skills, and demonstrate strong interpersonal communication, teamwork, organization and management ability in engineering practice. Be able to actively adapt to the changing situation and environment at home and abroad, and participate in international cooperation and competition.

III.专业毕业要求 Graduation Requirements

1.工程知识：能够将数学、自然科学、工程基础和专业知用于解决电气工程领域的复杂工程问题。

Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and engineering specializations to the solution of complex electrical engineering problems

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气工程领域的复杂工程问题，以获得有效结论。

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

3.设计/开发解决方案：能够设计针对电气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。

Design/ development of solutions: Design solutions for complex electrical 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.研究：能够基于科学原理并采用科学方法对复杂电气工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

Investigation: Conduct investigations of complex electrical engineering 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.使用现代工具：能够针对电气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，包括对复杂工程问题的预测与模拟，并能够理解其局限性。

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

6.工程与社会：能够基于电气工程专业背景知识进行合理分析，评价电气工程领域相关

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。

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

7.环境和可持续发展：能够理解和评价针对电气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。

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

8.职业规范：具有人文社会科学素养、社会责任感，能够在电气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: Apply ethical principles and commit to professional ethics and responsibilities and norms of electrical engineering practice.

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。

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

10.沟通：能够就电气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。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。

Communication: Communicate effectively on complex electrical 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.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: 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.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: 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.

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：电气工程，控制科学与工程，计算机科学与技术

Main Subject:Electrical engineering, Control science and engineering, Computer science and technology

核心课程 I/II/III/IV 方向: 学科基础课程: 高等数学、大学物理、线性代数、复变函数与积分变换、概率论与数理统计、工程制图、电路分析(含实验)、模拟电子技术、数字电子技术、信号与系统、工程电磁场、自动控制原理(含实验)、单片机原理(含实验)(I/II 方向)、MCU 原理及现代电子系统(含实验)(III/IV 方向)

学科基础课程 V 方向: 计算机程序设计基础、高等数学、大学物理、线性代数、复变函数与积分变换、概率论与数理统计、工程制图、电路分析(含实验)、模拟电子技术、数字电子技术、信号与系统、工程电磁场

Subject basic courses

Direction I/II/III/IV: Advanced mathematics, College physics, Linear algebra, Complex function and integral transformation, Probability theory and mathematical statistics, Engineering drawing, Circuit analysis(including experiment), Analog electronics technology, Digital electronics technology, Signal and system, Engineering electromagnetic field, Automatic control principle(including experiment), Single-chip microcomputer principle(including experiment) (Direction I/II), MCU principals and modern electronic system(including experiment) (Direction III/IV)

Direction V: Fundamentals of Computer Programming, Advanced mathematics, College physics, Linear algebra, Complex function and integral transformation, Probability theory and mathematical statistics, Mechanical drawing, Circuit analysis (including experiment), Analog electronics technology, Digital electronics technology, Engineering electromagnetic field,

专业基础课程:

I/II/III/IV 方向: 电机学、电力电子技术(含实验)、电力系统分析(含实验)

V 方向: 工程传热学、固体物理 B、量子力学、半导体材料、半导体物理、数字逻辑设计及应用、电力电子技术、电力系统分析

Specialized Core Course:

Direction I/II/III/IV: electrical engineering, power electronics technology (including experiment), power system analysis (including experiment)

Direction V: Engineering Heat Transfer, Solid-state physics, Quantum mechanics Semiconductor Material, Semiconductor Physics, Application and Design of Digital Logic, power electronics technology, power system analysis

专业课程:

第 I 方向: 供电系统(含实验)、电力系统继电保护原理(含实验)、接触网工程(含实验)、供变电技术、远动监控技术(含实验)、高电压技术(含实验)

第 II 方向: 电力系统暂态分析(含实验)、电力系统继电保护原理(含实验)、发电厂电气部分(含实验)、高电压技术(含实验)

第 III 方向: 电力牵引传动与控制(含实验)、先进列车运行控制技术、电力电子装置与控制、计算机辅助

电机设计实训、电力牵引系统课程设计、电力电子与电力传动实训、现场总线与列车网络控制(含实验)

第 IV 方向: 城轨交通供电系统及其自动化 (含实验)、电磁悬浮与线性驱动 (含实验)、城轨交通牵引系统及控制 (含实验)、磁浮列车悬浮系统课程设计/城轨交通供电系统课程设计、电力电子与电力传动实训

第V方向: 功率半导体器件原理、功率半导体器件工艺、功率半导体器件封装设计、电力电子器件课程实训、电力电子应用技术课程实训

Specialized courses:

Direction I: Power supply system (including experiment), Power system relay protection principle (including experiment), Catenary engineering, Power supply and transformation technology, Remote monitoring technology (including experiment), High voltage technology (including experiment)

Direction II: Transient analysis of power system (including experiment), Power system relay protection principle (including experiment), Electrical part of power plant (including experiment), High voltage technology (including experiment)

Direction III: Electric Traction Drive and Control (&Experiments)、Advanced control technology of train operation 、Power Electronics Equipment And Control 、Computer Aided Motor Design and Experiments、Course Design of Electric Traction System、Power Electronics & Electrical Drive System Design & Experiment、Field Bus Control Systems and Train Control Networks (&Experiments)

Direction IV: Power Supply System and Automation for Urban Rail Transit (Including Experiments) , Electromagnetic Suspension and Linear Drive, Urban Rail Vehicle Traction Systems & Control Systems (&Experiments) , Project on Maglev Suspension System /Project on Power Supply System for Urban Rail Transit, Power Electronics & Electrical Drive System Design & Experiment

Direction V: Principles of Power Semiconductor Devices, Power Semiconductor Device Technology, Package Design of Power Semiconductor, Design Project of Power Electronics Device, Design Project of Power Electronics Application Technology

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		选修 Free Electives		小计
		理论 Theory	实践 Practice	理论 Theory	实践 Practice	理论 Theory	实践 Practice	Subtotal
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
	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（含实验） Discipline and Specialty Foundational Courses(Including Experiments)	数学与自然科学基础课 Foundational Courses on Mathematics and Natural Science	25	2				27
	专业基础课 Professional Foundational Courses	44.5	8.5				I 方向 53
		46.25	8.75				II 方向 55
		48.25	9.75				III 方向 58
		48.25	9.75				IV 方向 58
		39.5	5.5				V 方向 45
专业课程（含实验） Specialized Courses(Including Experiments)	专业核心课程 Specialized Core Course	14.5	5.5				I 方向 20
		9.5	4.5				II 方向 14
		7.25	5.75				III 方向 13
		7.5	2.5		1		IV 方向 11
		30	1				V 方向 31
	专业限修课程 Specialized Restricted Courses			0			I 方向 0
				4			II 方向 4
				2			III 方向 2
				4			IV 方向 4
				0			V 方向 0
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				I/II/III/IV 方向 16
			13				V 方向 13
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			4			4

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								161

VII.课程设置细化表 Course Programs Table

公共基础课程 Public Basic Courses 共 33 学分，其中必修 31 学分，限修 2 学分，选修 0 学分 A total credits of 33, including 31 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	思想道德与法治 Ideological and Moral Education and the Rule of Law	必修 Compulsory	3	0.4	第 1 学期 1St Semester	马克思主义学院 School of Marxism	8.1、12.1	
	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	8.1、12.1	
	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	8.1、12.1	
	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	马克思主义学院 School of Marxism	8.1、12.1	
	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	马克思主义学院 School of Marxism	8.1、12.1	

	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	8.1、9.1、12.1	
	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	8.1、9.1、12.1	
	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	8.1、9.1、12.1	
	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	8.1、9.1、12.1	
思想政治类 Ideological Politics Courses	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	8.1、9.1、12.1	
	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	8.1、9.1、12.1	
	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	8.1、9.1、12.1	
	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	8.1、9.1、12.1	
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	8.1、9.1	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short Semester 1	武装部 Security Office	8.1、9.1	
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	10.3	
	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	10.3	
	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	10.3	
	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	9.1、10.3	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	9.1	

	体育 II Physical Education II	必修 Compulsory	1	1	第 2 学期 2Nd Semester	体育部 Dept. of Physical Education	9.1	
	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	9.1	
	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	9.1	
	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	9.1	
	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	9.1	
通识教育课程 General Education Courses 共 6 学分，其中必修 4 学分，限修 2 学分，选修 0 学分 A total credits of 6, including 4 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
核心通识课 Core General Education	工程伦理 Engineering ethics	必修 Compulsory	2		第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	6.2、6.3、8.2、9.1	
	工程经济学 Engineering economics	必修 Compulsory	2		第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	11.1、11.2	
新生研讨课 Freshman Seminar	高速铁路车网电气关系 Electrical Relations between Vehicle and Catenary of High Speed Railway	限修 Distributional Elective	2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	限修 2 学分 Distributional Elective 2 Credits
	高速铁路供电系统概论 High-speed Railway Power Supply System Generality		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	高速铁路弓网关系概论及前沿技术研讨 High-speed Railway Pantograph-Catenaries Relationship and Frontier Technology Seminar		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	跨界思维与创新研究探索 Tran Boundary Thinking and Innovation Research Exploration		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	

新生研讨课 Freshman Seminar	城市轨道交通新型供电制式漫谈及其发展趋势 Emerging Traction Power Supply Technology and Its Development Trend	限修 Distributional Elective	2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	限修 2 学分 Distributional Elective 2 Credits
	铁道电气化与自动化 Railway Electrification and Automation		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	高电压探秘 Secret of High Voltage		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	轨道交通牵引系统漫谈 Rambling on Rail Traffic Traction System		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	电气设备多目标优化设计漫谈 On Electrical Equipment Multi-objective Optimization Design		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	电气科学家及创新创业漫谈 Rambling on Electric Scientist and Innovation Entrepreneurship		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	磁浮交通系统技术 Maglev Transportation System Technology		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	轨道交通中的电子与信息 Rail Transit Electronics and Information		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	智能电子装备 Intelligent Electric Equipment		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	信息处理的广阔天地 The Big World of Information Processing		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	嵌入式系统与智能化 Embedded System and Intelligentized		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	能源互联网探讨 Energy Internet		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	

新生研讨课 Freshman Seminar	新能源发电技术概论 New Energy Power Generation Technology Generality	限修 Distributional Elective	2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	限修 2 学分 Distributional Elective 2 Credits
	高速铁路牵引供电新技术导论 Introduction to High-speed Railway Traction Power Supply Technology		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	高速铁路技术及装备 High-speed Railway Technology and Equipment		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
	能源与节能技术 Energy and Energy-saving Technology		2		第 1 学期 1St Semester	电气工程学院 School of Electrical Engineering	2.3、5.1、9.1、9.2、12.1	
学科与专业基础课程（含实验） Discipline and Specialty foundational Courses(Including Experiments) I 方向 共 80 学分，其中必修 80 学分，限修 0 学分，选修 0 学分 A total credits of 80 for Direction I, including 80 for compulsory courses, 0 for distributional electives and 0 for free electives II 方向 共 82 学分，其中必修 82 学分，限修 0 学分，选修 0 学分 A total credits of 82 for Direction II, including 82 for compulsory courses, 0 for distributional electives and 0 for free electives III 方向 共 85 学分，其中必修 85 学分，限修 0 学分，选修 0 学分 A total credits of 85 for Direction I, including 85 for compulsory courses, 0 for distributional electives and 0 for free electives IV 方向 共 85 学分，其中必修 85 学分，限修 0 学分，选修 0 学分 A total credits of 85 for Direction I, including 85 for compulsory courses, 0 for distributional electives and 0 for free electives V 方向 共 72 学分，其中必修 72 学分，限修 0 学分，选修 0 学分 A total credits of 72 for Direction I, including 72 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 Calculus I	必修 Compulsory	5		第 1 学期 1St Semester	数学学院 School of Mathematics	1.1	
	高等数学 II Calculus II	必修 Compulsory	5		第 2 学期 2Nd Semester	数学学院 School of Mathematics	1.1	
	线性代数 B Linear Algebra B	必修 Compulsory	3		第 1 学期 1St Semester	数学学院 School of Mathematics	1.1	
	复变函数与积分变换 Complex Functions and Integral Transformations	必修 Compulsory	3		第 3 学期 3Rd Semester	数学学院 School of Mathematics	1.1	
	概率论与数理统计 Probability Theory and Mathematical Statistics	必修 Compulsory	3		第 3 学期 3Rd Semester	数学学院 School of Mathematics	1.1	
	大学物理 BI Fundamentals of Physics BI	必修 Compulsory	3		第 2 学期 2Nd Semester	物理科学与技术学院 School of Physical and Technology	1.1	
	大学物理 BII Fundamentals of Physics BII	必修 Compulsory	3		第 3 学期 3Rd Semester	物理科学与技术学院 School of Physical and Technology	1.1	

数学与自然科学 基础课 Foundational Courses on Mathematics and Natural Science	大学物理实验 I College Physics Experiments I	必修 Compulsory	1	1	第 2 学期 2Nd Semester	物理科学与 技术学院 School of Physical and Technology	1.1	
	大学物理实验 II College Physics Experiments II	必修 Compulsory	1	1	第 3 学期 3Rd Semester	物理科学与 技术学院 School of Physical and Technology	1.1	
专业基础课 Professional Foundational Courses	工程制图 Engineering Drawing	必修 Compulsory	2	0.5	第 1 学期 1St Semester	机械工程学 院 School of Mechanical Engineering	1.2	
	计算机程序设计基础 Fundamentals of Computer Programming	必修 Compulsory	3	1	第 2 学期 2Nd Semester	计算机与人 工智能学院 School of Computing and Artificial Intelligence	1.2	
	电路分析 AI (含实验) Electric Circuits AI	必修 Compulsory	4	0.5	第 2 学期 2Nd Semester	电气工程学 院 School of Electrical Engineering	1.3、2.1、4.1	
	电路分析 AII (含实验) Electric Circuits AII	必修 Compulsory	4	0.5	第 3 学期 3Rd Semester	电气工程学 院 School of Electrical Engineering	1.3、2.1、4.1	
	模拟电子技术 B Analogue Electronic Technology B	必修 Compulsory	3		第 3 学期 3Rd Semester	信息科学与 技术学院 School of Information Science and Technology	1.3	
	模拟电子技术实验 Analogue Electronic Technology Experiments	必修 Compulsory	1	1	第 3 学期 3Rd Semester	信息科学与 技术学院 School of Information Science and Technology	1.3	
	数字电子技术 B Digital Electronic Technology B	必修 Compulsory	3		第 4 学期 4Th Semester	信息科学与 技术学院 School of Information Science and Technology	1.3	
	数字电子技术实验 Digital Electronic Technology Experiments	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	1.3	
	工程电磁场 Engineering Electromagnetic Fields	必修 Compulsory	3	0.25	第 4 学期 4Th Semester	电气工程学 院 School of Electrical Engineering	1.1、1.3、 1.4、2.1	
	电气工程概论 Introduction to Electrical Engineering	必修 Compulsory	2	0.25	第 4 学期 4Th Semester	电气工程学 院 School of Electrical Engineering	5.1、7.2、 8.2、11.1、 12.1	

专业基础课 Professional Foundational Courses	电力电子技术 A(含实验) Power Electronics A	必修 Compulsory	4	0.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2、4.1、	
	信号与系统 (含实验) Signals and Systems	必修 Compulsory	3	0.25	第 4 学期 4Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2	I/II/III/IV 方向
	自动控制原理 (含实验) Principles of Automatic Control	必修 Compulsory	4	0.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	1.3、2.1、12.2	I/II/III/IV 方向
	工程力学 C Engineering Mechanics C	必修 Compulsory	3		第 5 学期 5Th Semester	力学 School of Mechanics and Engineering	1.2	I/II/III/IV 方向
	电气测量技术 (含实验) Electrical Measurement Technology	必修 Compulsory	2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、4.1	I/II/III/IV 方向
	电力系统分析 A (含实验) Power System Analysis A	必修 Compulsory	4	0.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2、4.1、4.2、4.3、5.2、12.2	I/II 方向
	单片机原理 (含实验) Principles of Micro-Computer	必修 Compulsory	2	0.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	1.2、5.2	I/II 方向
	电机学 B Electrical Machinery B	必修 Compulsory	4		第 4 学期 4Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、2.2、12.2	I/II 方向
	电机学 B 实验 Electrical Machinery B Experiments	必修 Compulsory	1	1	第 4 学期 4Th Semester	电气工程学院 School of Electrical Engineering	3.1、4.1、5.2、9.2	I/II 方向
	电机学 AI Electrical Machinery AI	必修 Compulsory	4		第 4 学期 4Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、2.2、12.2	III/IV 方向
	电机学 AI 实验 Electrical Machinery AI Experiments	必修 Compulsory	1	1	第 4 学期 4Th Semester	电气工程学院 School of Electrical Engineering	3.1、4.1、5.2、9.2、10.2	III/IV 方向
	电机学 AII(含实验) Electrical Machinery AII Experiments	必修 Compulsory	2	0.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、2.2、4.1、9.1、12.2	III/IV 方向
	MCU 原理及现代电子系统 (含实验) MCU Principals and Modern Electronic System (Including Experiments)	必修 Compulsory	4	1.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	4.2、4.3、5.2	III/IV 方向

专业基础课 Professional Foundational Courses	电力系统分析 B Power System Analysis B	必修 Compulsory	3		第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2、4.1、4.2、4.3、5.2、12.2	III/IV/V 方向
	计算机网络与通信 Computer Networks and Communication	必修 Compulsory	2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.2、5.2	II/III/IV 方向
	工程传热学 Engineering Heat Transfer	必修 Compulsory	2		第 5 学期 5Th Semester	机械工程学院 School of Mechanical Engineering	1.1	V 方向
	固体物理 B Solid-state physics B	必修 Compulsory	2		第 6 学期 6Th Semester	物理科学与技术学院 School of Physical Science and Technology	1.1	V 方向
	量子力学 B Quantum mechanics B	必修 Compulsory	2		第 5 学期 5Th Semester	物理科学与技术学院 School of Physical Science and Technology	1.1	V 方向
	电机与拖动基础 Fundamental of Electrical Machine and Drive	必修 Compulsory	2	0	第 4 学期 4Th Semester	电气工程学院 School of Electrical Engineering	1.2、4.1、	V 方向
	自动控制原理 B Principles of Automatic Control B	必修 Compulsory	2	0	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	1.3、2.1、12.2	V 方向
	数字逻辑设计及应用 Application and Design of Digital Logic	必修 Compulsory	2	0.5	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	2.2、3.2、5.2	V 方向
专业课程 (含实验) Specialized Courses(Including Experiments)								
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
第 I 课程组 (轨道交通供电及其自动化) 1St Major: Rail Transit Automation and Power Supply 共 20 学分, 其中必修 20 学分, 限修 0 学分, 选修 0 学分 A total credits of 20, including 20 for compulsory courses, 0 for distributional electives and 0 for free electives								
专业核心课程 Specialized Core Course	高电压技术 (含实验) High Voltage Technology	必修 Compulsory	3	0.25	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	2.2、2.3、4.1、4.2、4.3	
	电力系统继电保护原理 (含实验) Power System Protective Relaying	必修 Compulsory	3	0.5	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、3.1、4.3、6.1	

专业核心课程 Specialized Core Course	接触网工程（含实验） Engineering of Overhead Contact System	必修 Compulsory	3	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、6.1、11.1	
	供电系统（含实验） Power Supply System	必修 Compulsory	3	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、3.1、4.3、6.1	
	远动监控技术（含实验） Remote Supervisory and Control Technology	必修 Compulsory	2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、3.1、4.3、6.1	
	供变电技术 Power Supply and Substation Techniques	必修 Compulsory	2		第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、3.1、6.1	
	接触网课程设计 Design Project of Overhead Contact Line System Engineering	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、10.2、11.2	
	电力系统继电保护课程设计 Design Project of Power System Protective Relaying	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、6.2、6.3、10.2	
	远动监控课程设计 Design Project of Remote Supervisory and Control	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、6.2、6.3、10.2	
	供变电技术课程设计 Design Project of Power Supply and Substation Techniques	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、6.2、6.3、10.2	
第 II 课程组（电力系统及其自动化） 2Nd Major: Power System and Its Automation 共 18 学分，其中必修 14 学分，限修 4 学分，选修 0 学分 A total credits of 18, including 14 for compulsory courses, 4 for distributional electives and 0 for free electives								
专业核心课程 Specialized Core Course	高电压技术（含实验） High Voltage Technology	必修 Compulsory	3	0.25	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	2.2、2.3、4.1、4.2、4.3	
	电力系统继电保护原理（含实验） Power System Protective Relaying	必修 Compulsory	3	0.5	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、3.1、4.3、6.1	
	发电厂电气部分（含实验） Electrical Parts of Power Plant	必修 Compulsory	3	0.5	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2、2.3、4.3	
	电力系统暂态分析（含实验） Power System Transient Analysis	必修 Compulsory	2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2、2.3、4.3、5.2	
	发电厂电气部分课程设计 Design Project of Electrical Part of Power Plant	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、6.2、6.3、10.2	

	高电压技术课程设计 Design Project of High Voltage Technology	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、6.2、6.3、10.2	
	继电保护课程设计 Design Project of Power System Protective Relaying	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.2、3.3、6.2、6.3、10.2	
专业限修课程 Specialized Restricted Courses	电力系统自动化 Power System Automation	限修 Distributional Elective	2		第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、2.2、3.1	限修 4 学分 Distributional Elective 4 Credits
	电力电子技术在电力系统中的应用 Application of Power Electronics in Power System		2		第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.2、3.1、3.2、5.2	
	电气设备状态监测（含实验） Condition Monitoring for Electric Equipment		2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、4.1、4.3、11.2	
	配电网自动化 Distribution Network Automation		2		第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2、5.1、7.1、10.2	
	微机保护与变电站自动化 Microcomputer-based Relay and Substation Automation System		2		第 7 学期 7Th Semester 期	电气工程学院 School of Electrical Engineering	1.4、2.1、2.2、5.2、12.1	
	自动化实训 Automation Practice		1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、4.1、4.2、4.3、5.2、10.1	
	电力系统过电压实训 Overvoltage Protection Practice		1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	2.1、2.2、4.1、4.2、4.3、9.1、10.1	
	智能电网实训 Smart Grid Practice		1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、4.1、4.2、4.3、5.2、10.1	
第III课程组（电力电子与传动控制） 3Rd Major: Power electronics and drive control 共 15 学分，其中必修 13 学分，限修 2 学分，选修 0 学分 A total credits of 15, including 13 for compulsory courses, 2 for distributional electives and 0 for free electives								
专业核心课程 Specialized Core Course	电力牵引传动与控制（含实验） Electric Traction Drive and Control（&Experiments）	必修 Compulsory	2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.2、2.3、12.1	
	先进列车运行控制技术 Advanced control technology of train operation	必修 Compulsory	2		第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	2.1、5.2	
	计算机辅助电机设计实训 Computer Aided Motor Design and Experiments	必修 Compulsory	2	2	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、3.3、5.2、10.2、11.2	

专业核心课程 Specialized Core Course	电力牵引系统课程设计 Course Design of Electric Traction System	必修 Compulsory	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、3.3、10.2、11.2	
	电力电子与电力传动实训 Power Electronics & Electrical Drive System Design & Experiment	必修 Compulsory	2	2	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、3.3、4.2、4.3、5.3、5.4、10.2、11.2	
	现场总线与列车网络控制 （含实验） Field Bus Control Systems and Train Control Networks	必修 Compulsory	2	0.5	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.1、5.2	
	电力电子装置与控制 Power Electronics Equipment And Control	必修 Compulsory	2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2	
专业限修课程 Specialized Restricted Courses	计算机控制系统 Computer-controlled Systems	限修 Distributional Elective	2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、4.1、5.2	限修 2 学分 Distributional Elective 2 Credits
	牵引电机与电器 Traction Motor and Electric Appliances		2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、9.2、10.2、12.2	
	电力电子系统建模与仿真 Modeling and Simulation of Power Electronics Systems		2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、4.1、5.2、9.1、12.2	
	检测技术与故障诊断 Measurement Technique and Fault Diagnosis		2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.3、4.2、5.1、6.1	
第IV课程组 （城轨与磁浮交通电气化） 4Th Major: Urban rail and maglev electrification 共 15 学分，其中必修 10 学分，限修 5 学分，选修 0 学分 A total credits of 15, including 10 for compulsory courses, 5 for distributional electives and 0 for free electives								
专业核心课程 Specialized Core Course	城轨交通供电系统及其自动化 Power Supply System and Automation for Urban Rail Transit（Including Experiments）	必修 Compulsory	3	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1	
	电磁悬浮与线性驱动（含实验） Electromagnetic Suspension and Linear Drive	必修 Compulsory	2	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、7.1、7.2、12.2	
	城轨交通牵引系统及控制 （含实验） Urban Rail Vehicle Traction Systems & Control Systems（&Experiments）	必修 Compulsory	3	0.25	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.2、2.3、6.2、6.3	

专业核心课程 Specialized Core Course	磁浮列车悬浮系统课程设计 Project on Maglev Suspension System	限修 Distributional Elective	1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、3.2、10.2	限修 1 学分 Distributional Elective 1 Credits
	城轨交通供电系统课程设计 Project on Power Supply System for Urban Rail Transit		1	1	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、3.2、10.2	
	电力电子与电力传动实训 Power Electronics & Electrical Drive System Design & Experiment	必修 Compulsory	2	2	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.1、3.2、3.3、5.2、10.2、11.2	
专业限修课程 Specialized Restricted Courses	牵引电机与电器 Computer-controlled Systems	限修 Distributional Elective	2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.1、9.2、10.2、12.2	限修 4 学分 Distributional Elective 4 Credits
	检测技术与故障诊断 Measurement Technique and Fault Diagnosis		2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.3、4.2、5.1、6.1	
	城轨综合监控技术 Remote Supervisory and Control Technology of Urban Rail Transit Power Supply System		2	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	1.4、2.2	
第V课程组（功率半导体器件及应用） 5Th Major: Power semiconductor devices and applications 共 31 学分，其中必修 31 学分，限修 0 学分，选修 0 学分 A total credits of 31, including 31 for compulsory courses, 0 for distributional electives and 0 for free electives								
专业核心课程 Specialized Core Course	半导体材料 Semiconductor Material	必修 Compulsory	2	0	第 5 学期 5Th Semester	电气工程学院 School of Electrical Engineering	2.1、3.2、3.3、12.2	
	半导体物理 Semiconductor Physics	必修 Compulsory	3	0	第 6 学期 6Th Semester	物理科学与技术学院 School of Physics	2.1、3.2、3.3、12.2	
	功率半导体器件原理 Principles of Power Semiconductor Devices	必修 Compulsory	3	0	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.1、3.2、3.3、12.2	
	功率半导体器件工艺 Power Semiconductor Device Technology	必修 Compulsory	4	0.5	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.1、3.2、3.3、12.2	校内/企业 On-campus/ Enterprise
	功率半导体器件封装设计 Package Design of Power Semiconductor	必修 Compulsory	4	0.5	第 6 学期 6Th Semester	电气工程学院 School of Electrical Engineering	2.1、3.2、3.3、12.2	校内/企业 On-campus/ Enterprise
	电力电子器件课程实训 Design Project of Power Electronics Device	必修 Compulsory	8	0	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	2.1、3.2、3.3、12.2	校内/企业 On-campus/ Enterprise
	电力电子应用技术课程实训 Design Project of Power Electronics Application Technology	必修 Compulsory	7	0	第 7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	2.1、3.2、3.3、12.2	校内/企业 On-campus/ Enterprise

实习实践教学 Practice Course I/II/III/IV 方向共 16 学分，其中必修 16 学分，限修 0 学分，选修 0 学分 I/II/III/IV: A total credits of 16, including 16for compulsory courses, 0 for distributional electives and 0 for free electives V方向共 13 学分，其中必修 13 学分，限修 0 学分，选修 0 学分 V: A total credits of 13, including 13for 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	电子市场调查实践 Electronic Market Research	必修 Compulsory	1	1	短 1 学期 Short Semester 1	电气工程学院 School of Electrical Engineering	6.2、9.2、10.1、11.2	
	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 Engineering training center	5.2、6.2	
	电子工艺实习 Electronic Process Practice	必修 Compulsory	2	2	短 2 学期 Short Semester 2	电气工程学院 School of Electrical Engineering	4.1、5.2	
	生产实习 Engineering Internship	必修 Compulsory	3	3	短 3 学期 Short Semester 3	电气工程学院 School of Electrical Engineering	6.2、7.1、8.2	I/II/III/IV 方向
	毕业设计（论文） Graduation Dissertation	必修 Compulsory	8	8	8 学期 8 Th Semester	电气工程学院 School of Electrical Engineering	2.3、3.3、5.3、5.4、10.1、10.2、10.3、12.2	
多元化课程 Diversified course 共 4 学分，其中必修 0 学分，限修 4 学分，选修 0 学分 A total credits of 4, including 0 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
跨学科课程 Interdisciplinary Course	新能源发电技术 New Energy Generation Technology	限修 Distributional Electives	2		7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.3、9.2、12.2	限修 2 学分 Distributional Elective 2 Credits 按照《西南交通大学多元化课程修读指导手册》执行。
	人工智能 Artificial Intelligence (AI)		2		7 学期 7Th Semester	电气工程学院 School of Electrical Engineering	3.3、9.2、12.2	
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		3.3、9.2、12.2	

学科竞赛类课程 Subject Competition Courses	全校学科竞赛课程 Subject Competition Courses of University	限修 Distributional Electives	2				3.3、9.2、12.2	Follow the 《Instruction manual of diversified courses of southwest Jiaotong University》
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				3.3、9.2、12.2	
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 Competition, Innovation Lectures, etc	课外创新实践 Innovation Practice	必修 Compulsory	2	2	2-7 学期 2-7 Semester	电气工程学院 School of Electrical Engineering	3.3、5.3、5.4、9.2	按照《西南交通大学创新实践学分认定与管理办法》规定执行 By Credit Recognition and Management of Innovative Practice in Southwest Jiaotong University
必修环节 A 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	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	体育部 Dept. of Physical Education		
学分总计 Total Credits			161					