

能源与动力工程专业辅修培养方案

Supportive Training Program for Energy and Power Engineering

一、培养目标 Objectives

本专业以培养德智体美劳全面发展的社会主义建设者和接班人为目标，面向交通的新能源动力装备领域，培养掌握数学、自然科学和工程科学的基础理论以及能源高效洁净转化与利用、能源动力装备与系统、能源与环境系统工程等专业知识，具有良好的人文素养、职业素质、国际视野、创新精神和社会责任感，具备综合运用知识和技能解决能源与动力工程领域的复杂工程问题的能力，能够在能源与动力工程行业从事科学研究、技术开发、工程与产品设计、系统运行及相关管理工作的复合型工程技术人才。毕业后通过专业实践和学习深造，成为卓越的工程师、优秀的研究人员以及行业领军人才。

The goal of this major is to cultivate well-rounded socialist constructors and successors who are oriented towards new energy power equipment in the transportation sector. Students will be equipped with fundamental theories in mathematics, natural sciences, and engineering sciences, along with specialized knowledge in energy-efficient and clean conversion and utilization of energy, energy power equipment and systems, and energy and environmental systems engineering. They will have a strong foundation in humanities, professional qualities, international perspectives, innovative spirit, and social responsibility. They will possess the ability to comprehensively apply knowledge and skills to solve complex engineering problems in the field of energy and power engineering. Graduates will be capable of engaging in scientific research, technical development, engineering and product design, system operation, and related management work in the energy and power engineering industry. Through professional practice and further education after graduation, they will become outstanding engineers, excellent researchers, and industry leaders.

二、培养要求 Requirements

1. 能够将数学、自然科学与工程科学的基础理论以及专业知识解决能源与

动力工程领域的复杂工程问题。

1. Master the basic theory of mathematics, natural sciences and engineering sciences, as well as the professional knowledge of mechanical engineering, and be able to use the knowledge to solve complex engineering problems such as design, manufacturing and control in the field of energy and power engineering.

2. 能够应用数学、自然科学和工程科学的基本原理和方法，对能源与动力工程领域的复杂工程问题进行识别、表达、分析，结合文献研究获得有效结论。

2. The graduates can apply the basic principles and methods of mathematics, natural sciences and engineering sciences to identify, express and analyze complex problems in energy and power engineering field, and obtain effective conclusions based on literature research.

3. 能够为能源与动力工程领域的复杂工程问题提出解决方案，设计满足特定需求的能源系统、产能及用能设备或能源生产和应用工艺流程，并能够在设计中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

3. Students can provide solutions to complex engineering problems in energy and power engineering, design systems, components or processes to meet their needs, and embody innovative ideas in the design, considering social, health, safety, legal, cultural and environmental factors.

4. 能够基于科学原理并采用科学方法对能源与动力工程领域的复杂工程问题开展研究，包括实验设计、实验实施和实验数据处理与分析，并通过信息综合获得有效结论。

4. The graduates can conduct research on complex engineering problems in energy and power engineering based on scientific principles and methods, including experimental design, experimental implementation and experimental data processing and analysis, and get effective conclusions through information synthesis.

5. 能够针对能源与动力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，包括对设计、制造、控制、运维等复杂工程问题进行预测和数值模拟，并能够理解其局限性。

5. The graduates can develop, select and use appropriate technology, resources, modern engineering tools and information technology tools to predict and simulate complex problems in energy and power engineering field, such as design, manufacturing and control, and understand their limitations.

三、学分要求 Credits Requirements

选择能源与动力工程专业的学生应最低修满 35 学分即完成学习，其中必修与限修课程不少于 33 学分，任选课程不少于 2 学分，并符合《西南交通大学本科生辅修与双学位管理办法》规定者，方可颁发本专业辅修证书。

Students minored in Energy and Power Engineering should study core compulsory courses of 35 credits, including no less than 33 credits for compulsory and restricted courses, and no less than 2 credits for optional courses. It is recommended that all 38 credits should be completed for high-standard study.

In this major, and comply with the Regulations of Southwest Jiaotong University on Minor and Dual Degree Management. Then, they can be issued their minor certificates of industrial engineering.

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 7 学分 Discipline Foundational Courses 8 Credits	控制工程基础 Control Engineering Foundation	必修 Compulsory	3	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
	电工和电子技术基础 A Fundamentals of Electrical and Electronic Technology A	必修 Compulsory	4	秋季 Autumn	电气工程学院 School of Electrical Engineering	
专业基础课程 必修 18 学分 任选 5 学分(至少修 2 学分) Professional Foundational Courses Compulsory 18 Credits Elective 5 Credits (Selected No less than 2 Credits)	流体力学 A Fluid Mechanics A	必修 Compulsory	4	春季 Spring	机械工程学院 School of Mechanical Engineering	
	工程热力学 A Engineering Thermodynamics A	必修 Compulsory	4	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
	传热学 A Heat Transfer A	必修 Compulsory	4	春季 Spring	机械工程学院 School of Mechanical Engineering	
	测试技术 Testing Technology Foundation	任选 Elective	3	春季 Spring	机械工程学院 School of Mechanical Engineering	
	能源与动力装置基础 Fundamentals of Energy and Power Devices	必修 Compulsory	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	

		燃料电池系统原理 Principles of Fuel Cell Systems	必修 Compulsory	2	春季 Spring	机械工程学院 School of Mechanical Engineering	
		氢能技术与应用 Hydrogen Energy Technology and Applications	必修 Compulsory	2	春季 Spring	机械工程学院 School of Mechanical Engineering	
		动力系统测试与分析 Testing and Analysis of Power Systems	任选 Elective	2	春季 Spring	机械工程学院 School of Mechanical Engineering	
实践环节 2 学分 Practice 2 Credit		专业综合实践 Professional Comprehensive Practice	必修 Compulsory	1	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		专业认识实习 Professional Cognition Practice	必修 Compulsory	1	短 3 Semester 3	机械工程学院 School of Mechanical Engineering	
任选一 课程组 不少于 6 学分 Distrib utional Elective 1 group ≥6 credits	第 1 课程 组 Cours e Group 1	发动机原理 Engine Principles	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		储能原理与技术 Energy Storage Principles and Technology	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		新能源系统热管理技术 Thermal Management Technology for New Energy Systems	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		新能源混合动力系统设计 Design of New Energy Hybrid Power System	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
	第 2 课程 组 Cours e Group 2	电化学基础 Electrochemistry Fundamentals	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		碳中和理论基础 Fundamentals of Carbon Neutrality	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		新能源系统运维技术 Operation and Maintenance Technology in New Energy Systems	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
		动力机械制造工艺 Manufacturing Technology of Power Machinery	限修 Distribution al Electives	2	秋季 Autumn	机械工程学院 School of Mechanical Engineering	
总学分 Total Credits				≥35			