

机械设计制造及其自动化专业辅修培养方案

Minor Training Program for Mechanical Design, Manufacturing and Automation

一、培养目标 Objectives

本专业培养掌握机械工程基础理论和专业知识，具备综合运用数学、自然科学和专业知识解决机械工程领域和轨道交通装备领域的复杂工程问题的能力，能够在机械工程特别是轨道交通装备行业从事产品设计、生产制造、自动控制、试验和科学研究等相关工作的卓越工程技术人才。

毕业 5 年应达到的目标：在专业能力和职业素养方面达到工程师水平，能够以工程师、技术骨干或者团队领导者的身份解决机械工程领域的复杂工程问题，并具备成长为卓越工程师、行业专家或优秀领导者的潜力。

This speciality aims to cultivate excellent engineers and technicians who understand the basic theories and the professional knowledge, who has the ability to solve complex engineering problems in the fields of mechanical engineering and rail transit equipment by making comprehensive use of the knowledge of math, natural sciences and professional fields, and who are able to conduct engineering design, manufacturing, automation, testing, scientific researches and other works relevant to the mechanical engineering and rail transportation equipment industries.

The goal to achieve in the 5 years of graduation: achieving the professional skills and professionalism of the engineer level, solving complex engineering problems in the field of mechanical engineering as engineers, technical backbones or leaders, and becoming a candidate to be senior engineers, industry experts and outstanding leaders.

二、培养要求 Requirement

为达成本专业的培养目标，学生毕业时在知识、能力和素质三个方面应达到规定的要求。

In order to achieve the training objectives of this major, students should meet the required requirements in knowledge, ability and quality when they graduate.

1. 问题分析能力。能够应用数学、自然科学和工程科学的基本原理和方法，对机械工程领域的设计、制造、控制、运维等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。

1. Analytical ability. The graduates can apply the basic principles and methods of mathematics, natural sciences and engineering sciences to identify, express and analyze complex engineering problems such as design, manufacturing and control, and obtain effective conclusions based on literature research.

2.设计/开发能力。能够为机械工程领域的复杂工程问题提出解决方案，设计满足需求的系统、部件或工艺流程，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。

2. Design/development capability. Students can provide solutions to complex engineering problems in mechanical engineering, design systems, components or processes to meet their needs, and embody innovative ideas in the design, taking into account social, health, safety, legal, cultural and environmental factors.

3.研究能力。能够基于科学原理并采用科学方法对机械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。

3. Research ability. The graduates can conduct research on complex engineering problems in mechanical 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.

4.现代工具使用能力。能够针对机械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。

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

5.工程与社会。能够基于机械工程相关背景知识进行合理分析，评价专业工程实践和复杂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。

5. Engineering and society. The graduates can make rational analysis based on relevant background knowledge of mechanical engineering, evaluate the impact of the professional engineering practice and solutions to complex engineering problems on

environment, society, health, safety, law, culture, understand and clarify their responsibilities.

6. 职业规范。具有良好的思想政治素质、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。

6. Professional norms. The graduates have humanities and Social Sciences literacy and sense of social responsibility. They can understand and abide by engineering professional ethics and norms in engineering practice and fulfill their responsibilities.

三、学分要求 Credits Requirements

选择机械设计制造及其自动化专业的学生应修学本专业的 43 学分课程，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 Mechanical Design, Manufacturing and Automation should study core compulsory courses of 43 credits 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 8 学分 Discipline Foundational Courses 8 Credits	理论力学 B Theoretical Mechanics B	必修 Compulsory	4	秋季 Autumn	力学 Sch. of Mechanics	
	材料力学 B Mechanics of Materials B	必修 Compulsory	4	春季 Spring	力学 Sch. of Mechanics	
专业基础课程 26 学分 Professional Foundational Courses 26 Credits	机械工程制图 I Mechanical Engineering Drawing I	必修 Compulsory	2	秋季 Autumn	机械 Sch. of Mech. Eng.	
	机械工程制图 II Mechanical Engineering Drawing II	必修 Compulsory	3	春季 Spring	机械 Sch. of Mech. Eng.	
	机械原理 A Mechanisms and Machine Theory A	必修 Compulsory	4	春季 Spring	机械 Sch. of Mech. Eng.	
	机械设计 A Mechanical Design A	必修 Compulsory	4	秋季 Autumn	机械 Sch. of Mech. Eng.	
	测试技术 Testing Technology	必修 Compulsory	3	春季 Spring	机械 Sch. of Mech. Eng.	

	控制工程基础 Control Fundamental	必修 Compulsory	3	秋季 Autumn	机械 Sch. of Mech. Eng.	
	制造技术 A Manufacturing Technology A	必修 Compulsory	4	秋季 Autumn	机械 Sch. of Mech. Eng.	
	流体传动与控制 Fluid Transmission and Control	必修 Compulsory	3	春季 Spring	机械 Sch. of Mech. Eng.	
专业核心课程 7 学分 Specialized Core Courses 7 Credits	机电传动与控制 Electromechanical Transmission and Control	必修 Compulsory	3	春季 Spring	机械 Sch. of Mech. Eng.	
	智能制造基础 Fundamentals of Intelligent Manufacturing	必修 Compulsory	2	秋季 Autumn	机械 Sch. of Mech. Eng.	
	有限元法及应用 Finite Element Method and Application	必修 Compulsory	2	春季 Spring	机械 Sch. of Mech. Eng.	
实践环节 2 学分 Practice Courses 2 Credits	机械原理课程设计 Mechanical Principles Curriculum Design	必修 Compulsory	1	短 2 Short Semester 2	机械 Sch. of Mech. Eng.	
	机械设计课程设计 Mechanism Curriculum Design	必修 Compulsory	1	春季 Spring	机械 Sch. of Mech. Eng.	
总学分 Total Credits			43			