

机械设计制造及其自动化专业培养方案

Undergraduate Program of Mechanical design, manufacturing and automation

I. 专业介绍 Introduction

机械设计制造及其自动化专业致力于培养能够运用专业知识和技能解决机械工程和轨道交通装备领域复杂工程问题的复合型工程技术人才。

专业起源于唐山路矿学堂（交通大学前身）1919年建立的机器科，迄今已有百年历史，先后随学校经历了从唐山到峨眉，最后定居成都的多次搬迁。1952年全国院系调整后专业定名为铁道机械专业，1996年以铁道机械专业为基础建立机械工程及自动化专业，2001本专业将部分专业方向合并组建车辆工程专业，原专业更名为机械设计制造及其自动化专业并延续至今。专业自建立以来，累计为机械工程和轨道交通装备行业培养了3万余名本科人才。

专业起源于铁路、发展于铁路，并随着轨道交通的发展而壮大，历史和时代赋予了本专业鲜明的轨道交通特色，已成为轨道交通建设与运维装备主要的人才培养和科研基地，在专业建设方面取得了众多荣誉：本专业是我校机械工程国家重点一级学科的支撑专业、2008年被评为国家品牌特色专业，2009年通过教育部优秀评估，2010年成为国家首批“卓越工程师计划”试点专业，2012年入选国家首批“专业综合改革试点”专业，2015年通过工程教育专业认证，学历在华盛顿协议签约国之间国际互认。

The Mechanical Design, Manufacturing and Automation engineering aims to cultivating outstanding engineering and technical talents who can apply their expertise and skills to solve complex engineering problems in the mechanical engineering and rail transit equipment disciplines.

The specialty originated from the machine department established in 1919 of the Tangshan Road Mining School (predecessor of Jiaotong University), which has a history of 100 years, and has experienced many relocations, from Tangshan to Emei and finally settled in Chengdu. In 1952, it was renamed as the railway mechanical major after the national department adjustment. In 1996, the mechanical engineering and automation speciality was established on the basis of the railway mechanical major. In 2001, some specialized directions of this speciality are merged and formed a new speciality, the vehicle engineering, and the original speciality was renamed as the mechanical design, manufacturing and automation, which has been used until now. Since the establishment of this speciality, more than 30,000 undergraduate talents have been cultivated for the mechanical engineering and rail transportation equipment industries.

The specialty began from the railway, developed with the railway, and grew up with the development of the rail transit industry. Hence, both the history and the era have endowed this specialty with the distinctive rail transit characteristics. Now, it has become an important base for cultivating talents and conducting scientific researches. Besides, it has won many honors: this speciality is the main major of the mechanical engineering discipline of the first-level national key disciplines in our university. In 2008, it was awarded the national brand specialty. In 2009, it passed the assessment of the Ministry of Education, and was rated as excellent. In 2010, it became an pilot speciality of the national “Excellent Engineer Program” of the first batch. In 2012, it was selected as one of the national “Pilot Program of Comprehensive Professional Reform” specialities

of the first batch. In 2015, it passed the engineering education professional certification.

专业代码: 080202

Program Code: 080202

专业名称: 机械设计制造及其自动化

Program Name: Mechanical design, manufacturing and automation

II. 培养目标 Objectives

立足于轨道交通装备行业, 面向机械工程领域, 培养掌握数学、自然科学和工程科学的基础理论以及机械工程专业知识, 具有良好的人文素养、职业素质、国际视野、创新精神和责任感, 具备综合运用知识和技能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, 能够在机械工程及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轨道交通装备领域的行业领军人才。

Based on the requirements of the rail transit equipment industry and the mechanical engineering discipline, this speciality aims to cultivate excellent engineers and technicians who understand the basic theories of mathematics, natural science and engineering sciences as well as the professional knowledge of the mechanical engineering, who has good humanistic quality, professional quality, international perspective, innovative spirit and social responsibility, 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 and skills, 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. He or she would become a distinguished engineer, an excellent researcher, or an industry leader of the rail transportation equipment field after graduation by pursuing professional practices and further studies.

毕业5年应达到的目标: 在专业技能和职业素养方面达到工程师水平, 能够以工程师、技术骨干或者研究人员的身份解决机械工程领域的复杂技术问题, 并具备成长为高级工程师、行业专家和高级研究人才的潜力。

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

III. 专业毕业要求 Graduation Requirements

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。知识结构方面需要掌握数学、自然科学、工程科学和机械工程专业的基础理论和方法, 并具备某一特色专业方向(机械制造、机械电子、工程机械、起重运输机械、模具设计)系统的专业知识和技能。能力结构方面应具备在考虑多种外部因素的情况下, 对机械工程领域的设计、制造和控制等技术问题进行分析、设计、研究的能力, 学生还应具备较强的系统观念、国际视野、创新思维、沟通交流和组织领导能力。职业素质方面应具备优良的思想品德、

人文素养、职业规范和社会责任意识，能通过自主学习以适应社会发展和技术进步。

In order to achieve the training objectives of this major, students should meet the required requirements in knowledge, ability and quality when they graduate. In terms of knowledge structure, students need to master the basic theories and methods of mathematics, natural science, engineering science and mechanical engineering, and have the professional knowledge and skills of a specific professional direction (mechanical manufacturing, mechanical electronics, engineering machinery, lifting and transportation machinery, die design). In terms of ability structure, students should have the ability to analyze, design and research technical problems such as design, manufacturing and control in mechanical engineering field, taking into account various external factors. Students should also have strong system concept, international vision, innovative thinking, communication and organizational leadership. In terms of vocational quality, students should have excellent ideological and moral character, humanistic quality, professional norms and social responsibility consciousness, and be able to adapt to social development and technological progress through independent learning.

知识结构要求:

Requirements of knowledge structure:

1. 掌握数学、自然科学与工程科学的基础理论以及机械工程专业知识，并能用于解决机械工程领域的设计、制造和控制等复杂工程问题。

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 mechanical engineering.

能力结构要求:

Requirements of ability structure:

2. 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，对设计、制造、控制等技术问题进行识别、表达、分析，结合文献研究获得有效结论。

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

3. 设计/开发能力。能够为机械工程领域的实际问题提出解决方案，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。

3. Design/development capability. Students can provide solutions to practical 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.

4. 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实际问题开展科学研究，包括实验设计、实验实施和实验数据处理与分析。

4. Research ability. The Graduates can conduct scientific research on practical problems in mechanical engineering based on scientific principles and methods, including experimental design, experimental implementation and experimental data processing and analysis.

5.现代工具使用能力。能够针对机械工程领域的实际问题，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，对设计、制造、控制等技术问题进行预测和数值模拟，并能够理解其局限性。

5. 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 technical problems such as design, manufacturing and control, and understand their limitations.

6.处理社会、环境与可持续发展问题的能力。能够基于机械工程相关背景知识进行合理分析，评价方案对环境、社会、健康、安全、法律、文化、环境以及可持续发展的影响，理解并明确应承担的责任，维护社会的可持续发展。

6. Ability to deal with social, environmental and sustainable development issues. The Graduates can make rational analysis based on relevant background knowledge of mechanical engineering, evaluate the impact of the program on environment, society, health, safety, law, culture, environment and sustainable development, understand and clarify their responsibilities, and maintain the sustainable development of society.

7.合作与组织能力。具有良好的团队合作意识和组织协调能力，能够在多学科背景下的技术团队中承担个体、团队成员以及负责人的角色。

7. Cooperation and organizational capacity. Good sense of teamwork and organizational coordination, able to assume the role of individual, team members and leaders in a multi-disciplinary technical team.

8. 沟通交流能力。具备良好的沟通表达、人际交往能力，能够就具体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。

8. Communication skills. Graduates have good communication and interpersonal skills, can effectively communicate and communicate with peers in the industry and the public on specific issues, including writing reports and designing manuscripts, presenting speeches, clearly expressing or responding to instructions, and have a certain international vision, and can communicate and respond to cross-cultural background. Communication.

9.项目管理能力。理解并掌握工程管理原理、经济学原理与决策方法，并能在机械工程领域内的具体项目中承担并完成项目管理任务。

9. Project management capability. The graduates can understand and master engineering management principles, economic principles and decision-making methods, and can undertake and complete project management tasks in specific projects in the field of mechanical engineering.

10.学习能力。具有自主学习与终身学习的意识，具备独立学习，适应社会和技术发展的能力。

10. Learning ability. The graduates have the consciousness of autonomous learning and lifelong learning, and the ability to learn independently and adapt to the development of society and technology.

素质结构要求：

Requirements of qualification structure

11.思想素质。具有良好的思想政治素质和科学的世界观、人生观、价值观，践行社会主义核心价值观。

11. Ideological quality. The graduates have good ideological and political quality, scientific

world outlook, outlook on life and values, and can practice socialist core values.

12. 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。

12. 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.

13. 创新意识。具有创新意识、创业精神和批判性思维，并能在解决机械工程实际问题的所有环节中体现。

13. Innovation consciousness. The graduates have innovative consciousness, entrepreneurship and critical thinking, which can be reflected in all aspects of solving practical problems in mechanical engineering.

IV. 学制与学位 Duration and Degree

学制：4 年

Duration: 4 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：机械工程、力学

Main Subject: Mechanical Engineering, Mechanics

主干课程：理论力学、材料力学、流体力学、热工基础、机械工程制图、机械原理、机械设计、制造技术、测试技术基础、控制工程基础、流体传动与控制、机械精度设计与检测基础、单片机原理与应用、有限元法及应用、机械振动、电机与控制、机器学习、工程经济与项目管理。

Main Course : Theoretical Mechanics, Mechanics of Materials, Hydrodynamics, Thermodynamics, Mechanical Engineering Drawing, Mechanisms and Machine Theory, Mechanical Design, Manufacturing Technology, Basic Testing Technology, Control Fundamental, Fluid Transmission and Control (Bilingual), Mechanical Accuracy Design and Testing Foundation, Principle and Application of Single-chip Microcomputer, Finite Element Analysis, Mechanical Vibration, Motor and Motion Control, Machine Learning, Engineering Economy and Project Management.

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	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(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	23.5	2.5					26
	专业基础课 Professional Foundational Courses	45.5	12.5					58
专业课程(含实验) Specialized Courses(Including Experiments)	专业核心课程 Specialized Core Course	8	2					10
	专业限修课程 Specialized Restricted Courses			8				8
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		14					14
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								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 2 学期 2Nd Semester	马克思主义学院 School of Marxism	6、11、12	
	中国近现代史纲要 Conspectus of modern Chinese history	必修 Compulsory	3	0.4	第 1 学期 1St Semester	马克思主义学院 School of Marxism	11、12	
	马克思主义基本原理 The Basic Principles of Marxism	必修 Compulsory	3	0.4	第 4 学期 4Th Semester	马克思主义学院 School of Marxism	11、12	
	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	11、12	
	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	11、12	
	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、11	
	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	6、11	
	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	6、11	
	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	6、11	
	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	6、11	
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、11		

思想政治类 Ideological Politics Courses	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	6、11	
	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	6、11	
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	11、12	
	军事技能 Military Skills	必修 Compulsory	2	2	短1学期 Short Semester 1	武装部 Security Office	7、12	
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	8、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	8、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	8、10	
	职场英语 Workplace English	限修 Distribution al Elective	2	0	第4学期 4Th Semester	外国语学院 School of Foreign languages	8	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						8	
	语言、文化与翻译 Language, Culture and Translation						8	
英语公共演讲 Public Speaking in English	8							
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	12	
	体育 II Physical Education II	必修 Compulsory	1	1	第2学期 2Nd Semester	体育部 Dept. of Physical Education	12	
	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	12	
	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	12	
	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	12	

	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	12	
通识教育课程 General Education Courses 共 6 学分，其中必修 0 学分，限修 6 学分，选修 0 学分 A total credits of 6, including 0 for compulsory courses, 6 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 2-7 学 期 2Nd-7Th Semester		3、6、7、8、12	限选 2 门， 4 学分 Limited to 2 courses, 4 credits
新生研讨课 Freshman Seminar	轨道交通现状及前沿 技术 Current Situation and Frontier Technology of Rail Transit	限修 Distributional Elective	2		第 2 学期 2Nd Semester	机械工 程学 院 Sch. of Mech. Eng.	6、9、10、13	限选 1 门 2 学分 Limited to one course, 2 credits
	现代企业管理与工业 工程 Modern Enterprise Management and Industrial Engineering							
	现代起重与工程机械 技术 Modern Lifting and Construction Machinery Technology							
	机电液一体化技术导 论 Introduction to Mechatronics and Hydraulic Integration Technology							
	机器人导论 Introduction to Robots							
	高端机械装备漫谈 Introduction to High-end Machinery and Equipment							
	仿生机械 Bionic Machinery							
	微纳先进制造前沿 Advanced Manufacturing Frontier of Micro-nano							
	从化石能源到新能源 From Fossil Energy to New Energy							
	发动机的前世今生 The Past and Present of The Engine							
	建筑环境与能源技术 Building Environment and Energy Technology							
	二十一世纪的制造技 术 Manufacturing Technology in the 21st Century							
测控技术导论 Introduction to Measurement and Control Technology								

学科与专业基础课程 (含实验)								
Discipline and Specialty foundational Courses(Including Experiments)								
共 84 学分, 其中必修 84 学分, 限修 0 学分, 选修 0 学分								
A total credits of 84 including 84 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、2	
	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、2	
	线性代数 B Linear Algebra B	必修 Compulsory	3		第 2 学期 2Nd Semester	数学学院 School of Mathematics	1、2	
	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	2、4	
	大学物理 BI College Physics BI	必修 Compulsory	3		第 2 学期 2Nd Semester	物理科学与技术学院 School of physics	1	
	大学物理 BII College Physics BII	必修 Compulsory	3		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 I College Physics Experiment 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	
	大学物理实验 II College Physics Experiment 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	
	工程化学 C Engineering Chemistry C	必修 Compulsory	2	0.5	第 1 学期 1St Semester	生命科学与工程学院 School of Life Science	1、6	
专业基础课 Professional Foundational Courses	机械工程概论 Introduction to Mechanical Engineering	必修 Compulsory	1	0.5	第 1 学期 1St Semester	机械工程学院 Sch. of Mech. Eng	2、3、6、12、13	前 8 周 The first 8 weeks
	轨道交通概论 Introduction to Rail Transit	必修 Compulsory	1	0.5	第 1 学期 1St Semester	机械工程学院 Sch. of Mech. Eng	2、3、6、12、13	后 8 周 Later 8 weeks
	计算机程序设计基础 Fundamentals of Computer Programming	必修 Compulsory	3	1	第 1 学期 1St Semester	信息科学与技术学院 School of Electronic Information	2、5	

专业基础课 Professional Foundational Courses	机械工程制图 I Mechanical Engineering Drawing I	必修 Compulsory	2		第 1 学期 1St Semester	机械工 程学 院 Sch. of Mech. Eng	1、3	
	机械工程制图 II Mechanical Engineering Drawing II	必修 Compulsory	3	1	第 2 学期 2Nd Semester	机械工 程学 院 Sch. of Mech. Eng	1、3	
	三维设计与制图 Three-dimensional Design and Drawing	必修 Compulsory	2	0.5	第 3 学期 3Rd Semester	机械工 程学 院 Sch. of Mech. Eng	1、3、5	
	工程材料 Engineering Materials	必修 Compulsory	2		第 3 学期 3Rd Semester	材料科学 与工程学 院 School of Materials	1、3	
	电工技术 B Electrical Technology B	必修 Compulsory	3	0.5	第 3 学期 3Rd Semester	电气工 程学 院 School of Electrical Engineerin g	1、4	
	电子技术 B Electronic technology B	必修 Compulsory	3	0.5	第 4 学期 4Th Semester	电气工 程学 院 School of Electrical Engineerin g	1、4	
	理论力学 B Theoretical Mechanics B	必修 Compulsory	4	1	第 3 学期 3Rd Semester	力学与工 程学院 School of Mechanics	1、2、4	
	材料力学 B Mechanics of Materials B	必修 Compulsory	4	1	第 4 学期 4Th Semester	力学与工 程学院 School of Mechanics	1、2、4	
	流体力学 B Fluid Mechanics B	必修 Compulsory	2		第 5 学期 5Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、2、4	
	热工基础 Fundamentals of Thermodynamics and Heat Transfer	必修 Compulsory	3	0.5	第 5 学期 5Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、4	
	机械原理 A Mechanisms and Machine Theory A	必修 Compulsory	4	0.5	第 4 学期 4Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、2、3、4	
	机械设计 A Mechanical Design	必修 Compulsory	4	0.5	第 5 学期 5Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、2、3、4	
	测试技术基础(双语) Basic Testing Technology (Bilingual)	必修 Compulsory	3	1	第 4 学期 4Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、4	
	控制工程基础 Control Fundamental	必修 Compulsory	3	1	第 5 学期 5Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、2、3	

专业基础课 Professional Foundational Courses	单片机原理与应用 Principle and Application of Singlechip Microcomputer		必修 Compulsory	2	1	第5学期 5Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、3	
	机械精度设计与检测基础 Mechanical Accuracy Design and Verification Foundation		必修 Compulsory	2	0.5	第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	1、3	
	制造技术 A Manufacturing Technology A		必修 Compulsory	4	0.5	第5学期 5Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、3	
	流体传动与控制(双语) Fluid Transmission and Control (Bilingual)		必修 Compulsory	3	0.5	第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、3	
专业课程(含实验) Specialized Courses(Including Experiments) 共18学分, 其中必修10学分, 限修8学分, 选修0学分 A total credits of 18, including 10 for compulsory courses, 8 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	电机与控制 Motor and Control		必修 Compulsory	2	1	第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、3	
	机器学习 Machine Learning		必修 Compulsory	2		第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、4、5	
	工程经济与项目管理 Engineering Economy and Project Management		必修 Compulsory	2		第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	3、7、9	
	有限元法及应用 Finite Element Method and Application		必修 Compulsory	2	1	第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	2、3、4、5	
	机械振动 Mechanical Vibration		必修 Compulsory	2		第6学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、4	
专业限修课程 Specialized Restricted Courses	工程机械方向 Major of Construction Machinery	工程机械理论与设计 Theory and Design of Construction Machinery	限修 Distributional Electives	3		第7学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.	1、4、6、10、12	
		工程机械构造学 Construction Machinery Tectonics	限修 Distributional Electives	3		第7学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.		

专业限修课程 Specialized Restricted Courses		铁路线路机械 Railway Line Machinery	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
	起重运输 机械方向 Major of Lifting and Transporti ng Machinery	起重机金属 结构 Crane Metal Structure	限修 Distribution al Electives	3		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、4、6、10、12	
		起重运输机 械 Lifting and Transporting Machinery	限修 Distribution al Electives	3		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
		起重机电气 控制系统 Electrical Control System of Crane	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
		机械制造工 艺学 Mechanical Manufacturi ng Technology	限修 Distribution al Electives	3		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
	机械制造 方向 Major of Mechanica l Manufactu ring	机床数控及 加工技术 CNC and Machining Technology of Machine Tools	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、4、6、10、12	
		机械制造工 艺装备设计 Mechanical Manufacturi ng Process Equipment Design	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
		自动化制造 系统 Automated Manufacturi ng System	限修 Distribution al Electives	1		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
		模具 CAD/CAE CAD/CAE of Moulds	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		
	模具方向 Major of Mould	模具制造工 艺学 Mold Manufacturi ng Technology	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.	1、4、6、10、12	
		冲压成形工 艺与模具设 计 Stamping Forming Technology and Mould Design	限修 Distribution al Electives	2		第 7 学期 7Th Semester	机械工 程学 院 Sch. of Mech. Eng.		

专业限修课程 Specialized Restricted Courses		塑料成型工艺及模具设计 Plastic Forming Technology and Mould Design	限修 Distributional Electives	2		第 7 学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.		
		机电系统建模与仿真 Modeling and Simulation of electromechanical systems	限修 Distributional Electives	2		第 7 学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.		
	机械电子方向 Major of Mechanical and Electronic	机电系统故障诊断 Fault Diagnosis of Electromechanical System	限修 Distributional Electives	2		第 7 学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.	1、4、6、10、12	
		机电一体化系统设计 Mechatronics System Design	限修 Distributional Electives	2		第 7 学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.		
		机器人技术 Robot Technology	限修 Distributional Electives	2		第 7 学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.		

实习实践教学

Practice Course

共 14 学分，其中必修 14 学分，限修 0 学分，选修 0 学分

A total credits of 14, including 14 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
基本技能培训、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	工程训练 A Engineering Training A	必修 Compulsory	2	2	第 2 学期 2Nd Semester	工程中心 Engineering Training Center	6、12	
	机械原理课程设计 Mechanical Principles Curriculum Design	必修 Compulsory	1	1	短 2 Short Semester 2	机械工程学院 Sch. of Mech. Eng.	2、3、6、8	
	机械设计课程设计 Mechanism Curriculum Design	必修 Compulsory	1	1	第 6 学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	2、3、6、8	前 8 周 The first 8 weeks
	机电综合设计实践 Practice of Electromechanical Integrated Design	必修 Compulsory	1	1	第 6 学期 6Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、3、9、13	后 8 周 Later 8 weeks

and Graduation Design	专业认识实习 Professional Cognition Practice	必修 Compulsory	1	1	短3 Short Semester 3	机械工程学院 Sch. of Mech. Eng.	6、7、12	
	毕业设计（论文） Graduation Design (Thesis)	必修 Compulsory	8	8	第8学期 8Th Semester	机械工程学院 Sch. of Mech. Eng.	1、2、3、4、5、6、10、13	
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 Courses	产品质量控制 Product Quality Control	限修 Distributional Elective	2		第7学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.	1、9	限选2门， 4学分 Limited to 2 courses, 4 credits
	智能制造导论 Introduction to Intelligent Manufacturing		2		第7学期 7Th Semester	机械工程学院 Sch. of Mech. Eng.	1、13	
美育专业课程 Aesthetic Education Courses	工业设计导论 Introduction to Industrial Design		2		第7学期 7Th Semester	建筑与设计学院 School of Architecture and Design	1、3	
创新创业实践 Innovation and Entrepreneurship Practice 共2学分，其中必修0学分，限修2学分，选修0学分 A total credits of 2, including 0 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
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	创新创业训练计划项目 Innovative Entrepreneurship Training Program	限修 Distributional Elective	2	2	2-7学期 2-7 Semester	机械工程学院 Sch. of Mech. Eng.	4、6、7、8、9、13	主持或参与结题至少1项 Leading or participation at least one project conclusion
	个性化实验项目 Individualized Experiment Project		2	2	2-7学期 2-7 Semester	机械工程学院 Sch. of Mech. Eng.		主持或参与结题至少1项 Leading or participation at least one project conclusion

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	大学生科研训练计划 SRTP		2	2	2-7 学期 2-7 Semester	机械工程学院 Sch. of Mech. Eng.		主持或参与结题至少 1 项 Leading or participation at least one project conclusion
	工程实践 Engineering Practice		2	2	2-7 学期 2-7 Semester	机械工程学院 Sch. of Mech. Eng.		主持或参与结题至少 1 项 Leading or participation at least one project conclusion
	学科竞赛 Discipline Competition		2	2	2-7 学期 2-7 Semester	机械工程学院 Sch. of Mech. Eng.		获校级一等奖或省部级及以上竞赛三等奖及以上 Winning the first prize at this university or the third prize at the provincial level or above

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	7、8、19、13	
	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	12	
学分总计 Total Credits						学分: 160 Credits: 160		

注:

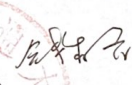
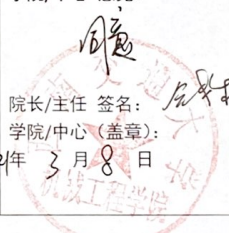
1.课程明细中未列出核心通识课程名称，共 4 学分，本专业学生应按学校要求，在“交通天下”通识教育类课程中选择，不能以其他选修课代替。

2.创新创业实践 2 学分只能选择表中所列 5 类项目，其中：个性化实验、学科竞赛、工程实践、SRTP 项目必须是机械学院教师指导完成的项目。学生参加完项目后，提供证明材料，由学院认定通过后给予学分。

Note: 1. The name of the core general education curriculum is not listed in the curriculum details, totaling 4 credits. Students of this major should choose the general education curriculum of "traffic world" according to the requirements of the school, and cannot replace them with other elective courses.

2. The course of Innovation and entrepreneurship practice with 2 credits can only be chosen from the five types of projects listed in the table. The personalized experiment, subject competition, engineering practice, SRTP project must be completed under the guidance of teachers in school of mechanical engineering. The students participating in the project should provide proof materials and can grant the credits after the acceptance by the college.

西南交通大学培养方案变更申请表

申请单位		专业（方向）		涉及年级		涉及学生人数	
机械工程学院		机械设计制造及其自动化		2019级、2020级、2021级		1000人	
课程名称	课程编码	课程学分	选修性质	开课学期	变更内容	变更原因	
机电综合设计实践	MECE008113	1	必修	6	更改课程名称为：机电设备综合设计实践	课程内容与培养目标更贴近	
本专业专家论证意见（可另附表）：							
专业负责人意见： <div style="text-align: center; font-size: 2em;">同意</div> 专业负责人签名：田怀文 2021年3月8日		教授委员会意见： 经2021年3月8日教授委员会讨论，与会委员表决情况如下： <div style="text-align: center; font-size: 2em;">同意</div> 教授委员会主任签名： 2021年3月8日			学院/中心 意见： <div style="text-align: center; font-size: 2em;">同意</div> 院长/主任 签名：  学院/中心（盖章）：  2021年3月8日		
开课学院/中心 意见：（如变更课程非本单位需要填写本栏） <div style="text-align: center; font-size: 2em;">同意</div> 开课单位教学负责人 签名：田怀文 2021年3月8日							

西南交通大学培养方案变更申请表

申请单位		专业（方向）		涉及年级		涉及学生人数	
机械工程学院		机械设计制造及其自动化		2019级、2020级、2021级		100人	
课程名称	课程编码	课程学分	选修性质	开课学期	变更内容	变更原因	
模具 CAD/CAE	MECE007112	2	限修	7	删除	专业方向升级改造	
模具制造工艺学	MECE007212	2	限修	7	删除	专业方向升级改造	
冲压成形工艺与模具设计	MECE007312	2	限修	7	删除	专业方向升级改造	
塑料成型工艺及模具设计	MECE007412	2	限修	7	删除	专业方向升级改造	
本专业专家论证意见（可另附表）：							
专业负责人意见： 同意 专业负责人签名：2021年3月8日 田坪文		教授委员会意见 2021年3月8日 经年月日教授委员会讨论，与会委员表决情况如下： 同意 教授委员会主任签名：2021年3月8日			学院/中心意见： 同意 院长/主任签名： 学院/中心（盖章）： 2021年3月8日 机械工程学院		
开课学院/中心意见：（如变更课程非本单位需要填写本栏） 同意 开课单位教学负责人签名：田坪文 2021年3月8日							
本科教学工作委员会意见： 经年月日本科教学工作委员会讨论，与会委员表决情况如下： 同意 本科教学工作委员会主任签名：年3月10日 2021							