

材料科学与工程专业培养方案

Undergraduate Program of the Major of Materials Science and Engineering

I. 专业介绍 Introduction

本专业以轨道交通建设、国家经济建设和社会需要为导向,解决材料科学的相关问题,服务国民经济,培养德、智、体等方面全面发展,具备材料科学与工程的基本理论和专业知识及实验技能,创新能力强,能在各种材料的制备、加工、材料的结构与性能的研究及分析等领域从事科学研究与教学、技术开发、工艺和设备设计、生产、经营管理等方面工作的高素质材料科学技术人才和研究型复合人才。

This major takes rail transit construction, national economic construction and social needs as the direction to solve related problems in materials science and serves for national economy. The aim is to cultivate high-quality talents of materials science and technology and research-oriented comprehensive talents with all-round development in moral, intellectual and physical aspects, who have basic theory of materials science and engineering, professional knowledge, experimental skills, strong creativity, and the ability to engage in scientific research and teaching, technology development, process and equipment design, production, management and other aspects in the field of preparation and processing of various materials, research and analysis of the structure and properties of materials, etc.

专业代码: 080401

Program Code: 080401

专业名称: 材料科学与工程专业

Program Name: Materials Science and Engineering

II. 培养目标 Objectives

本专业以培养知识、能力和素质全面发展的社会主义建设者和接班人为目标,培养德、智、体、美全面发展的有社会担当和健全人格,有职业操守和专业才能,有人文情怀和科学素养,有历史眼光和全球视野,有创新精神和批判思维的“五有”高素质材料科学与工程专业人才,培养掌握数学、自然科学和工程科学的基础理论以及材料科学与工程专业知识,具备综合运用知识和技能解决材料科学与工程领域复杂工程问题的能力。

本专业毕业生毕业五年内达到的目标: 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材料科学与工程领域的复杂工程问题,并具备成长为优秀工程师、行业专家或优秀领导者的潜力。具体目标如下:

The major aims to cultivate socialist builders and successors with all-round development of knowledge, ability and quality, and cultivate moral, intellectual, physical and aesthetic all-round

development of material science and engineering professionals, with socially responsible and sound personality, professional ethics and professional ability, humanistic feelings and scientific literacy, historical vision and global vision and innovative spirit and critical thinking, and also train them to master the basic theories of mathematics, natural science and engineering science as well as professional knowledge of materials science and engineering, and have the ability to comprehensively apply knowledge and skills to solve complex engineering problems in the field of materials science and engineering.

The goal of graduates within five years of graduation: to reach the level of an engineer in terms of professional ability and professionalism, to solve complex engineering problems in the field of materials science and engineering as an engineer, technical backbone or team leader, and to have the potential to grow into an excellent engineer, industry expert or excellent leader. The specific objectives are as follows:

(1) 有职业操守和专业才能, 具备金属材料科学与工程基础知识和解决金属材料制备、加工、改性及服役等方面复杂工程问题的能力, 适应国家材料工业及轨道交通领域经济建设需要;

Having professional ethics and professional ability, the basic knowledge of metal materials science and engineering and the ability to solve complex engineering problems in the preparation, processing, modification and service of metal materials, and meet the needs of the national material industry and economic construction in the field of rail transit;

(2) 有社会担当和健全人格, 具备良好的职业素养、职业道德、社会责任感, 将自身发展与社会发展融合, 为社会主义建设和国家发展服务;

Having social responsibility and sound personality, good professional quality, professional ethics, social responsibility, integrating their own development with social development, and serving the socialist construction and national development;

(3) 有创新精神和批判思维, 能进行金属材料分析检测与评价、新材料和新工艺的设计与开发, 成为金属材料工程领域的复合型工程技术人才;

Having innovative spirit and critical thinking, be able to analyze and evaluate metal materials, design and develop new materials and new processes, and becoming a composite engineering and technical talent in the field of metal materials engineering;

(4) 有历史眼光和全球视野, 具备有效的交流沟通能力、创新意识、团队精神、国际视野和管理能力, 成为材料工程领域的管理人才;

Having historical vision and global vision, effective communication skills, innovation consciousness, team spirit, international vision and management ability, becoming a management talent in the field of materials engineering;

(5) 有人文情怀和科学素养, 具备自主、终生的学习能力, 可从事材料科学与工程领域的科学研究或继续深造。通过专业实践和学习深造, 成为优秀的工程师、优秀的研究人员以及轨道交通材料领域的行业领军人才。

Having humanistic feelings and scientific literacy, with independent and lifelong learning ability, be able to engage in scientific research or further study in the field of materials science and engineering. Through professional practice and further study, becoming an excellent engineer, excellent researcher and industry leader in the field of rail transit materials.

III.专业毕业要求 Graduation Requirements

本专业立足于学生能力的培养，特别是在工程实践能力、综合创新能力、计算机应用能力和外语应用能力等方面的培养。培养具备宽厚的材料领域的基础知识与技能，能从事科研、技术开发、分析检测、工艺和设备设计、生产经营管理等方面的高素质科技人才，具备国际化竞争能力。学生不仅具有宽厚的基础理论知识和较强的工程实践技能，而且通过将最新科研成果引入教学内容的教学、通过学生参与教师的实际科研项目的特色工程实践活动等教学环节，学生需要满足以下 12 项特征要求。

The major of Materials Science and Engineering aims at the promotion of students' general ability including engineering practice, creativity, computing and foreign language. They should have gained the broad and profound knowledge of materials sciences and engineering, and necessary experimental technique and skills, being able to work in the academic field or industry including technique development, analysis and test, process and equipment design and manufacture management. Moreover, by introducing the professors' latest scientific achievement into teaching activity and get student involved into practical research projects, students are expected to meet following 12 characteristic requirements.

1.工程知识：能够将数学、自然科学、工程基础、材料科学与工程基础知识用于解决材料制备、加工、改性及服役等复杂工程问题。

Knowledge for engineering: having the ability to apply the fundamental knowledge in mathematics, natural science, engineering foundation, material science and engineering to solve the complex problems occurred in the fields of material preparation, process, modification and service practice.

1-1 具有较全面的数学、自然科学、工程基础、材料科学与工程基础知识，并能将这些科学的语言工具用于材料工程问题的表述；

1-1 Having a comprehensive knowledge of mathematics, natural science, engineering fundamentals, materials science and engineering fundamentals, and be able to use these scientific language tools to express materials engineering problems;

1-2 能针对具体的材料工程对象建立数学模型并求解；

1-2 Be able to establish mathematical models and solve them for specific material engineering objects;

1-3 能够将相关知识和数学模型方法用于推演、分析材料制备、加工、改性及服役等复杂工程问题；

1-3 Be able to apply relevant knowledge and mathematical modeling methods to deduce and analyze complex engineering problems such as material preparation, processing, modification and service;

1-4 能够将相关知识和数学模型方法用于材料制备、加工、改性及服役等复杂工程问题解决方案的比较与综合。

1-4 Be able to apply relevant knowledge and mathematical modeling methods to compare and synthesize solutions for complex engineering problems such as material preparation, processing, modification and service.

2.问题分析：能够应用数学、自然与工程科学的基本原理、材料科学与工程的基本原理与方法，利用材料分析检测手段，识别、表达、并通过文献研究分析复杂材料工程问题，以获得有效结论。

Problem analysis: having the ability to apply the basic principle and methodology of

mathematics, nature and engineering science as well as material science and engineering, and to utilize the methods of material characterization so as to recognize and then analyze the complicated material engineering problems by literature review, consequently drawing scientific conclusions.

2-1 针对复杂材料工程问题，能够利用数学、物理化学和工程科学的基本原理进行合理分析，建立数学物理模型；

2-1 Aiming at complex engineering problems in materials, having the ability to make reasonable analysis by using the basic principles of mathematics, physics, chemistry and engineering science, and establish mathematical and physical models;

2-2 能够运用材料科学基本原理，熟练进行材料的成分-工艺-结构-性能的关系分析，提出影响材料性能的关键因素及其优化措施；

2-2 Be able to apply the basic principles of material science, skillfully analyze the relationship between composition, process, structure and property of materials, and put forward the key factors affecting material property and find out the optimization measures;

2-3 通过文献收集与分析，利用材料分析检测手段，能够对材料的各种制备、加工及改性方法与工艺进行技术综合分析，提出合理性判断。

2-3 Be able to estimate the reasonability of technologies in materials fabrication, processing, modification by comprehensive analysis of literature review and materials characterizations.

3.设计/开发解决方案：能够设计针对复杂材料工程问题的解决方案，设计满足特定需求的材料及工艺流程，并能够在设计环节中体现创新意识，考虑技术标准、社会、健康、安全、法律、文化以及环境等因素。

Designing & Exploring solutions: having the ability to design special required materials and process technologies on the basis of the solutions with respect to the complicated material engineering problems, and reflecting the innovation in the design procedure by taking into account the technical standards, sociology, health, safety, law, culture, environment and so on.

3-1 针对复杂工程问题，根据设计与服役环境要求，能够提出材料选择方案；

3-1 Be able to select materials correctly according to the requirements of design and service environment for complex engineering problems;

3-2 综合考虑效率、经济性、安全等因素，提出材料制备、加工与改性方案，设计出合理工艺；

3-2 Considering the factors of efficiency, economy and safety, propose the reasonable scheme of materials fabrication, processing and modification;

3-3 综合考虑技术标准、社会、健康、安全、法律、文化以及环境等因素，选择或开发满足工程需要的材料及工艺，并能将创新思想融入解决方案。

3-3 Select or develop materials and processes that meet engineering needs, considering technical standards, social, health, safety, legal, cultural and environmental factors, and integrate innovative ideas into solutions.

4.研究：能够基于科学原理并采用科学方法对复杂材料工程问题进行研究，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。

Research: having the ability to conduct relative researches to solve the complicated material engineering problems on the basis of scientific principles and methodologies, involving the experimental design, data analysis and explanation as well as information synthesis, consequently drawing scientific conclusions.

4-1 掌握科学原理和实验方法，针对复杂工程问题设计合理的实验方案与路线；

4-1 Be skilled in scientific principles and experimental methods, design reasonable

experimental schemes and routes for complex engineering problems;

4-2 开展基础实验,准确获取、分析并解释实验数据,并将实验结果进行关联以获得有效结论的能力;

4-2 Ability to conduct basic experiments, accurately obtain, analyze and interpret experimental data, and correlate experimental results to obtain effective conclusions;

4-3 能够设计相关的测试、检验、控制等实验,开展对复杂工程问题的实验研究,并通过信息综合获得有效实验结论;

4-3 Be able to design experiments of test, inspection and control, carry out experimental research on complex engineering problems, and obtain effective experimental conclusions through information synthesis;

4-4 根据工程实际,基于材料科学原理,研究开发新材料和新工艺,并对其进行合理的评价,得到可靠有效的结论。

4-4 Based on the engineering practice and the principle of material science, research and develop new materials and new processing, and obtain the reliable and effective conclusions by a reasonable evaluation.

5.使用现代工具:能够针对复杂工程问题,选择与使用恰当的材料制备、加工、检测、评价等先进技术,以及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。

Utilizing the modern tools: having the ability to select and use proper advanced technologies of material preparation, process, test, evaluation, etc., as well as modern engineering tools and information technology tools, including the prediction and simulation for the complicated engineering problems, and to further know their limitation as well.

5-1 能够运用计算机软件进行材料设计、数值模拟、程序开发及数据库设计等,具有综合运用所学知识分析问题和解决问题的能力,并理解其局限性;

5-1 Be able to apply computer software for material design, numerical simulation, program development and database design, etc., have the ability to solve problems by comprehensively applying the learned knowledge, and understand their limitations;

5-2 具备选择与利用现代材料制备、加工、改性及测试方法的能力,能够对各种新方法和新技术的优点与不足有明确的了解;

5-2 Have the ability to select and utilize modern methods of material fabrication, processing, modification and testing, and have a clear understanding of the advantages and disadvantages of various new methods and technologies;

5-3 具有利用现代化信息技术与资源解决复杂材料工程问题的能力。

5-3 Be able to use modern information technology and resources to solve complex material engineering problems.

6.工程与社会:能够基于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。

Engineering and Society: having the ability to explore reasonable analysis based on the engineering-related background, and to evaluate the influence of engineering practice and complex engineering problem solutions on the society, health, safety, law and culture, and understanding the responsibility to be undertaken.

6-1 了解材料科学工程专业领域相关政策、法律法规、技术标准和规范;

6-1 Understand relevant policies, laws and regulations, technical standards and norms in the field of material science and engineering;

6-2 能够评价材料使用对社会、环境、安全、健康等方面的影响，具有高度的社会责任感；

6-2 Be able to evaluate the influences of materials on society, environment, safety and health, with a high sense of social responsibility;

6-3 能够评价材料科学与工程专业领域复杂工程材料的制备、加工、处理等解决方案对环境、社会、安全、健康及法律等方面的影响，具有高度的社会责任感。

6-3 Be able to evaluate the influences of the fabrication, processing and treatment of complex engineering materials on the environment, society, safety, health and law, with a high sense of social responsibility.

7.环境和可持续发展：能够理解和评价针对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: having the ability to understand and evaluate the influence of engineering practice for the complex engineering problems on the environment and social sustainability.

7-1 能够正确理解材料科学与工程专业领域的环境问题，了解相关领域最新绿色环保新技术，提出合理的解决办法；

7-1 Be able to correctly understand the environmental problems in the field of material science and engineering, understand the latest green and environmental protection technologies in relevant fields, and propose reasonable solutions;

7-2 能够正确理解材料科学与工程专业领域的发展与能源、社会可持续发展之间关系，并能够做出合理的评价；

7-2 Be Able to correctly understand the relationship between the development of material science and engineering and the sustainable development of energy and society, and be able to make reasonable evaluation;

7-3 根据环境和可持续发展的要求，具备针对复杂工程问题的材料生产，选择替代材料和工艺的能力。

7-3 Having the ability to select alternative materials and processes for complex engineering problems in accordance with environmental and sustainable development requirements.

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。

Professional norms: be with humanities sciences and social sciences accomplishment as well as social responsibility, and be able to understand and abide by engineering professional ethics and norms in engineering practice, and then fulfilling responsibility.

8-1 掌握辩证唯物主义的基本原理，树立科学的人生观、世界观和价值观；

8-1 Understanding the basic principles of dialectical materialism, establishing a scientific outlook on life, world view and values;

8-2 具有刻苦与奉献的敬业精神和职业道德，树立法制意识和观念，做合法、守法的社会公民，具有良好的工程意识、实践意识、质量意识、安全意识。

8-2 Having the spirit of dedication and professional ethics, establish legal awareness and concept, to be the legal, law-abiding social citizens with a good sense of engineering, practice, quality awareness, safety awareness.

9.个人和团队：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。

Individual and team: be able to well play the role of individual, team members and leader in the multidisciplinary team.

9-1 具有一定组织能力、表达能力、社交能力，诚信做人、诚信做事，具有领导、协调、配合的团队意识和能力；

9-1 Have a certain of organization ability, expression ability, social ability, to be an honest person, work honestly, have the team consciousness and ability of leadership, coordination and cooperation;

9-2 具有较强的创新意识和创新精神，具有求真务实的精神和理性的批判意识，能主动跟踪自然科学和材料科学等重要发现和主要进展。

9-2 Having a strong sense of innovation and innovation spirit, realistic and pragmatic spirit and rational critical consciousness, able to actively follow the important discoveries and major progress in science and material science.

10.沟通：能够就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: having the ability to conduct effective communication and exchange with peers and the publics on the complicated engineering issues, including reports writing and case design, speech, expression or response, and be with an international perspective so as to communicate each other in a cross-cultural context.

10-1 能够正确组织语言，用汉语就专业领域的复杂工程问题规范正确地撰写报告，并具有与同行进行学术交流的能力；

10-1 Be able to use language correctly, write professional reports in Chinese on complex engineering problems, and have the ability to conduct academic communication with peers;

10-2 系统掌握至少一门外语，具有一定的听说读写能力、专业外文文献查阅能力，能够使用外文撰写科技论文，表述本专业领域里的工程问题等；

10-2 Systematically learn at least one foreign language, with a certain level of listening, speaking, reading and writing ability, professional foreign literature searching ability, able to use foreign language to write scientific papers, express the engineering problems in major field;

10-3 掌握材料领域的专业术语，了解国内外材料相关标准和规范体系，能够在跨文化背景下进行沟通和交流。

10-3 Be skilled in professional terms in the field of materials, understand relevant standards and norms of materials at domestic and overseas, and be able to communicate in a cross-cultural context.

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: understanding and grasping the principles of project management and the methodologies of economic decision-making, and be able to apply them into the environmental application of multidisciplinary.

11-1 了解中国特色的社会主义市场经济特点；

11-1 Understand the characteristics of the socialist market economy with Chinese characteristics;

11-2 具备一定的市场经济和工程管理知识，具备一定的经济分析和管理能力；

11-2 Have the knowledge of market economy and engineering management, have the ability of economic analysis and management;

11-3 针对轨道交通行业，具备应用工程管理原理与经济决策方法进行市场分析和项目管理的能力。

11-3 Aiming at rail transit industry, have the ability to apply engineering management

principles and economic decision-making methods to market analysis and project management.

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。

Life-long learning: be with the awareness of self-learning and lifelong learning, and be with the capability to continuously learning and adapt to the development.

12-1 具有自主学习和终身学习的意识；

12-1 Have the consciousness of independent learning and lifelong learning;

12-2 不断学习和适应发展的能力。

12-2 Ability to learn and adapt to development.

IV.学制与学位 Duration and Degree

学制：四年

Duration: Four Years

学位：工学学士学位

Degree: Bachelor of Engineer Degree

V.主干学科与专业核心课程 Main Subject and Specialized Core Course

主干学科：材料科学与工程

Main Subject: Materials Science and Engineering

专业核心课程：物理化学、材料科学基础、材料工艺基础（金属材料制备技术、无机非金属材料工艺学）、材料物理性能、材料力学性能、材料分析测试

Specialized Core Course: Physical Chemistry、Material Science Basis、Material Process Foundation (Metallic Material Preparation Technology、Inorganic Nonmetallic Material Preparation Technology)、Material Physics Performance、Material Mechanics Performance、Materials Characterization and Analysis

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 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	思政类 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
通识与多元 化课程 General Education and Diversified Courses	“交通天下”通识教育课程（含跨学科课程） Core General Education Courses (Interdisciplinary Courses)							6
	多元化课程 Diversified Courses							
	国际课程 International Courses					6		
	大学生心理健康教育课程 University Student Psychological Health Courses							
	学生成长与发展规划课程 Student Growth and Development Planning Courses							
	劳动教育课程 Labor Education Courses	2						2
	公共艺术课程 Public Art Courses	2						2

学科与专业基础课程 Discipline and Specialty Foundational Courses	数学类 Mathematics Courses	16						16
	物理类 Physics Courses	8	2					10
	计算机基础类 Basic Computer Courses	2	1					3
	化学类 Chemistry Courses	2	1					3
	机械类 Mechanical Courses	5.5	0.5					6
	材料类 Materials Courses	6	1					7
	力学类 Mechanics Courses	3						3
	电工类 Electrical Engineering Courses	6.25	0.75					7
专业教育课程 Specialized Courses	专业核心课 Specialized Core Course	22.25	3.75					26
	专业限选课 Specialized Restricted Courses			15	3			18
实践教学环节 Practice Courses	集中性实践教学环节：基本技能训练、工程实践、综合课程设计、社会与文化素质和实践、毕业实习与毕业设计 Centralized Practical Teaching Process: Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design		17					17
	创新创业实践：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 Practice: Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc		2					2

必修环节 A Compulsory Part	“第二课堂”项目：思想政治与道德素养类项目、学术科技与创新创业类项目、艺术体验与审美修养类项目、文化沟通与交往能力类项目、心理素质与身体素质类项目、社会工作与领导能力类项目、社会实践与志愿服务类项目 "The Second Lesson" Project: Ideological and Political Education and Moral Literacy Projects, Academic and Technological Innovation and Entrepreneurship Projects, Art Experience and Aesthetic Education Projects, Cultural Communication and Interpersonal Skills Projects, Psychological and Physical Health Projects, Social Work and Leadership Development Projects, Social Practice and Volunteering Projects							0
	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
思政类 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 Semester 1	马克思主义学院 School of Marxism	6-2 8-2	
	中国近现代史纲要 Conspectus of Chinese Modern History	必修 Compulsory	3	0.4	第 2 学期 Semester 2	马克思主义学院 School of Marxism	6-2 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 Semester 3	马克思主义学院 School of Marxism	8-1 11-1 11-2	
	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 4 学期 Semester 4	马克思主义学院 School of Marxism	8-1 11-1 11-2	
	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 Semester 6	马克思主义学院 School of Marxism	8-1 11-1 11-2	
	形势与政策 I Situation and Policy I	必修 Compulsory	0	0	第 1 学期 Semester 1	马克思主义学院 School of Marxism	8-2 12-2	
	形势与政策 II Situation and Policy II	必修 Compulsory	0	0	第 2 学期 Semester 2	马克思主义学院 School of Marxism	8-2 12-2	
	形势与政策 III Situation and Policy III	必修 Compulsory	0	0	第 3 学期 Semester 3	马克思主义学院 School of Marxism	8-2 12-2	
	形势与政策 IV Situation and Policy IV	必修 Compulsory	0	0	第 4 学期 Semester 4	马克思主义学院 School of Marxism	8-2 12-2	
	形势与政策 V Situation and Policy V	必修 Compulsory	0	0	第 5 学期 Semester 5	马克思主义学院 School of Marxism	8-2 12-2	
	形势与政策 VI Situation and Policy VI	必修 Compulsory	0	0	第 6 学期 Semester 6	马克思主义学院 School of Marxism	8-2 12-2	

	形势与政策Ⅶ Situation and Policy Ⅶ	必修 Compulsory	0	0	第 7 学期 Semester 7	马克思主义学院 School of Marxism	8-2 12-2	
	形势与政策Ⅷ Situation and Policy Ⅷ	必修 Compulsory	2	0	第 8 学期 Semester 8	马克思主义学院 School of Marxism	8-2 12-2	
军事类 Military Courses	军事理论 Military Theories	必修 Compulsory	2	0	第 1 学期 Semester 1	武装部 Security Office	8-2 9-2	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short Semester 1	武装部 Security Office	9-1	
外语类 Foreign Language Courses	英语 I College English I	必修 Compulsory	2	0	第 1 学期 Semester 1	外国语学院 School of Foreign languages	9-1 10-2	
	英语 II College English II	必修 Compulsory	2	0	第 2 学期 Semester 2	外国语学院 School of Foreign languages	9-1 10-2	
	通用学术英语 English for General Academic Purposes	必修 Compulsory	2	0	第 3 学期 Semester 3	外国语学院 School of Foreign languages	10-2	
	职场英语 Workplace English	限修 Distributional Elective	2	0	第 4 学期 Semester 4	外国语学院 School of Foreign languages	10-2	限修 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 Semester 1	体育学院 School of Physical Education	8-1	
	体育 II Physical Education II	必修 Compulsory	1	1	第 2 学期 Semester 2	体育学院 School of Physical Education	8-1	
	体育 III Physical Education III	必修 Compulsory	0.5	0.5	第 3 学期 Semester 3	体育学院 School of Physical Education	8-1	
	体育 IV Physical Education IV	必修 Compulsory	0.5	0.5	第 4 学期 Semester 4	体育学院 School of Physical Education	8-1	
	体育健康课程 I Diversified Physical Education Courses I	必修 Compulsory	0.5	0.5	第 5 学期 Semester 5	体育学院 School of Physical Education	8-1	
	体育健康课程 II Diversified Physical Education Courses II	必修 Compulsory	0.5	0.5	第 6 学期 Semester 6	体育学院 School of Physical Education	8-1	

通识与多元化课程 General Education and Diversified Courses 共 10 学分，其中必修 4 学分，限修 0 学分，选修 6 学分 A total credits of 10, including 4 for compulsory courses, 0 for distributional electives and 6 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
“交通天下”通识教育课程（含跨学科课程） Core General Education Courses (Interdisciplinary Courses)	“交通天下”通识教育课程（含跨学科课程） Core General Education Courses (Interdisciplinary Courses)	选修 Free Electives	6	0	2-8 学期 Semester 2-8	全校 The whole school	7-2 11-3 12-1 12-2	
多元化课程 Diversified Courses	多元化课程 Diversified Courses						7-2 11-3 12-1 12-2	
国际课程 International Courses	国际课程 International Courses						7-2 11-3 12-1 12-2	
大学生心理健康教育课程 University Student Psychological Health Courses	大学生心理健康教育课程 University Student Psychological Health Courses						7-2 11-3 12-1 12-2	
学生成长与发展规划课程 Student Growth and Development Planning Courses	学生成长与发展规划课程 Student Growth and Development Planning Courses						7-2 11-3 12-1 12-2	
劳动教育课程 Labor Education Courses	劳动教育课程 Labor Education Courses	必修 Compulsory	2	0	2-8 学期 Semester 2-8	全校 The whole school	7-2 11-3 12-1 12-2	
公共艺术课程 Public Art Courses	公共艺术课程 Public Art Courses	必修 Compulsory	2	0	2-8 学期 Semester 2-8		7-2 11-3 12-1 12-2	

学科与专业基础课程 Discipline and Specialty foundational Courses 共 55 学分，其中必修 55 学分，限修 0 学分，选修 0 学分 A total credits of 55, including 55 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
数学类 Mathematics Courses	高等数学 I Advanced Mathematics I	必修 Compulsory	5	0	第 1 学期 Semester 1	数学学院 School of Mathematics	1-1 1-2 2-1	
	高等数学 II Advanced Mathematics II	必修 Compulsory	5	0	第 2 学期 Semester 2	数学学院 School of Mathematics	1-1 1-2 2-1	
	线性代数 B Linear Algebra B	必修 Compulsory	3	0	第 1 学期 Semester 1	数学学院 School of Mathematics	1-2	
	概率论与数理统计 Probability and Statistics	必修 Compulsory	3	0	第 3 学期 Semester 3	数学学院 School of Mathematics	1-1 2-1 4-1	
物理类 Physics Courses	大学物理 AI College Physics AI	必修 Compulsory	4	0	第 2 学期 Semester 2	物理科学与技术学院 School of Physical Science and Technology	1-1 2-1 4-1	
	大学物理 AII College Physics AII	必修 Compulsory	4	0	第 3 学期 Semester 3	物理科学与技术学院 School of Physical Science and Technology	1-1 2-1 4-1	
	大学物理实验 I College Physics Experiments I	必修 Compulsory	1	1	第 2 学期 Semester 2	物理科学与技术学院 School of Physical Science and Technology	1-3 4-2	
	大学物理实验 II College Physics Experiments II	必修 Compulsory	1	1	第 3 学期 Semester 3	物理科学与技术学院 School of Physical Science and Technology	1-3 4-2	
计算机基础类 Basic Computer Courses	计算机程序设计基础 Foundation of Computer Programming	必修 Compulsory	3	1	第 2 学期 Semester 2	计算机与人工智能学院 School of Computing and Artificial Intelligence	5-1 5-3	
化学类 Chemistry Courses	工程化学 A Engineering Chemistry A	必修 Compulsory	3	1	第 1 学期 Semester 1	化学学院 School of Chemistry	1-1 2-1 4-1	
机械类 Mechanical Courses	机械制图 A Mechanical Drawing A	必修 Compulsory	4	0.5	第 1 学期 Semester 1	机械工程学院 School of Mechanical Engineering	1-1 4-4	
	机械制造技术基础 Mechanical Manufacturing Technology Basics	必修 Compulsory	2	0	第 2 学期 Semester 2	机械工程学院 School of Mechanical Engineering	1-4 3-3	

材料类 Materials Courses	物理化学 A Physical Chemistry A	必修 Compulsory	3	0	第 2 学期 Semester 2	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-1 4-1	
	物理化学 A 实验 Physical Chemistry Experiments A	必修 Compulsory	1	1	第 2 学期 Semester 2	化学学院 School of Chemistry	4-1 4-2 10-1	
	材料成型加工技术基础 Material Forming Processing Technology Basics	必修 Compulsory	3	0	第 4 学期 Semester 4	材料科学与工程学院 School of Materials Science and Engineering	1-3 2-3 3-2	
力学类 Mechanics Courses	工程力学 C Engineering Mechanics C	必修 Compulsory	3	0	第 4 学期 Semester 4	力学与航空航天学院 School of Mechanics and Aeronautics	1-1 4-2	
电工类 Electrical Engineering Courses	电工基础 Electrician Basics	必修 Compulsory	4	0.5	第 4 学期 Semester 4	电气工程学院 School of Electrical Engineering	1-1 4-3	
	电子技术基础 C Electronic technology Basics C	必修 Compulsory	3	0.25	第 5 学期 Semester 5	电气工程学院 School of Electrical Engineering	1-3	
专业教育课程 Specialized Courses 共 44 学分，其中必修 26 学分，限修 18 学分，选修 0 学分 A total credits of 44, including 26 for compulsory courses, 18 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 Specialized Core Course	轨道交通材料导论 Introduction to Rail Transit Materials	必修 Compulsory	2	0	第 2 学期 Semester 2	材料科学与工程学院 School of Materials Science and Engineering	7-1 7-2 7-3 9-1 9-2 12-1	
	材料科学基础 AI Materials Science Basics AI	必修 Compulsory	4	0	第 3 学期 Semester 3	材料科学与工程学院 School of Materials Science and Engineering	1-1 1-3 2-2	
	材料科学基础 AII Materials Science Basics AII	必修 Compulsory	3	0	第 4 学期 Semester 4	材料科学与工程学院 School of Materials Science and Engineering	1-1 1-3 2-2	
	材料科学基础实验方法 I Materials Science Basics Experimental Methods I	必修 Compulsory	0.5	0.5	第 3 学期 Semester 3	材料科学与工程学院 School of Materials Science and Engineering	1-4 4-2 10-1	

专业核心课 Specialized Core Course	材料科学基础实验方法 II Materials Science Basics Experimental Methods II	必修 Compulsory	0.5	0.5	第 4 学期 Semester 4	材料科学与工程学院 School of Materials Science and Engineering	1-4 4-2 10-1	
	材料力学性能 A Mechanical Properties of Materials A	必修 Compulsory	3	0	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 2-3 6-1	
	材料物理性能 Physical Properties of Materials	必修 Compulsory	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-3 2-3 4-4	
	材料性能研究技术 I Materials Performance Study Technology I	必修 Compulsory	0.5	0.5	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	4-2 5-2 6-1 10-1	
	材料性能研究技术 II Materials Performance Study Technology II	必修 Compulsory	0.5	0.5	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	4-2 5-2 6-1 10-1	
	材料分析测试 (双语) Materials Characterization and Analysis (Bilingual)	必修 Compulsory	2	0.5	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	2-3 5-2	
	轨道交通材料及其加工工艺 Rail Transit Materials and Processing Technologies	必修 Compulsory	2	0	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	2-2 3-1 4-1 7-3	
	工程材料学 (金属材料方向) Engineering Materials	必修 Compulsory	3	0.25	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 3-1 6-1 7-3	
	金属材料制备方法 (金属材料方向) Preparation Approach of Metallic Materials	必修 Compulsory	1	1	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	3-1 5-2 9-2	
	金属材料制备技术 (金属材料方向) Preparation Technology of Metallic Materials	必修 Compulsory	2	0	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 3-2 5-2	
	工程陶瓷材料 (无机非金属材料方向) Engineering Ceramic Materials	必修 Compulsory	3	0.25	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 3-1 6-1 7-3	

专业核心课 Specialized Core Course	无机非金属材料制备方法（无机非金属材料方向） Preparation Approach of Inorganic Nonmetallic Materials	必修 Compulsory	1	1	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	3-1 5-2 9-2	
	无机非金属材料工艺学（无机非金属材料方向） Preparation Technology of Inorganic Nonmetallic Materials	必修 Compulsory	2	0	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 3-2 5-2	
	工程材料学（材料服役安全工程方向） Engineering Materials	必修 Compulsory	3	0.25	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 3-1 6-1 7-3	
	材料失效分析实验方法（材料服役安全工程方向） Experimental Methods for Material Failure Analysis	必修 Compulsory	2	0	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	3-1 5-2 9-2	
	材料失效学（材料服役安全工程方向） Materials Failure	必修 Compulsory	1	1	第 5 学期 Semester 5	材料科学与工程学院 School of Materials Science and Engineering	1-3 3-2 5-2	
专业限选课（金属材料方向） Specialized Restricted Courses	材料热处理(双语) Heat Treatment of Materials (Bilingual)	限修 Distributional Elective	2	1	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	3-3 6-3 9-1 10-2	限修 18 学分 Distributional Elective 18 credits
	材料设计与模拟 Material Design and Simulation	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-3 2-1 3-1 4-2 5-1 5-3	
	复合材料 Composite Materials	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-2 6-3	
	金属功能材料 Metallic Functional Materials	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-4 3-1 6-1 7-3	
	粉末冶金原理 Principle of Powder Metallurgy	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	3-3 6-3 9-1 10-2	
	材料表面技术 Materials Surface Technology	限修 Distributional Elective	2	0.25	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	2-3 3-2 4-2 6-3	

专业限修课（金属材料方向） Specialized Restricted Courses	无损检测技术 Non-destructive Testing Technology	限修 Distributional Elective	2	0.25	第 6 学期 Semester 6	材料科学与 工程学院 School of Materials Science and Engineering	2-3 4-1 4-3	
	材料失效分析 Material Failure Analysis	限修 Distributional Elective	2	1	第 7 学期 Semester 7	材料科学与 工程学院 School of Materials Science and Engineering	3-1 4-3 9-1	
	摩擦学原理 Tribological Principle	限修 Distributional Elective	2	0.25	第 7 学期 Semester 7	材料科学与 工程学院 School of Materials Science and Engineering	1-4 2-2 6-3	
	材料腐蚀与防护 Corrosion and Protection of Materials	限修 Distributional Elective	2	0.25	第 7 学期 Semester 7	材料科学与 工程学院 School of Materials Science and Engineering	1-4 2-3 7-2	
	材料与交通 Materials and Transportations	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与 工程学院 School of Materials Science and Engineering	4-1 4-4 5-1 5-2 10-3 11-2 12-1	
	专业外语（材料科学与工程） Professional English (Material Science and Engineering)	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与 工程学院 School of Materials Science and Engineering	10-2 10-3	
	国家质量基础（NQI） 导论 Introduction to National Quality Foundation (NQI)	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与 工程学院 School of Materials Science and Engineering	6-1 10-3 11-3	
专业限修课（无机非金属材料方向） Specialized Restricted Courses	纳米材料与纳米技术 Nanomaterials and Nanotechnology	限修 Distributional Elective	2	1	第 6 学期 Semester 6	材料科学与 工程学院 School of Materials Science and Engineering	3-3 6-3 9-1 10-2	限修 18 学分 Distributional Elective 18 credits
	材料设计与模拟 Material Design and Simulation	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与 工程学院 School of Materials Science and Engineering	1-3 2-1 3-1 4-2 5-1 5-3	
	复合材料 Composite Materials	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与 工程学院 School of Materials Science and Engineering	1-4 2-2 6-3	
	功能陶瓷材料 Functional Ceramic Materials	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与 工程学院 School of Materials Science and Engineering	1-3 3-1 6-1 7-3	

专业限选课（无机非金属材料方向） Specialized Restricted Courses	粉末冶金原理 Principle of Powder Metallurgy	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	3-3 6-3 9-1 10-2	
	材料表面技术 Materials Surface Technology	限修 Distributional Elective	2	0.25	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	2-3 3-2 4-2 6-3	
	无损检测技术 Non-destructive Testing Technology	限修 Distributional Elective	2	0.25	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	2-3 4-1 4-3	
	材料失效分析 Material Failure Analysis	限修 Distributional Elective	2	1	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	3-1 4-3 9-1	
	新能源材料与器件 New Energy Materials and Devices	限修 Distributional Elective	2	0.25	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-2 6-3	
	绿色建筑与环境材料 Green Building and Environmental Materials	限修 Distributional Elective	2	0.25	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-3 7-2	
	材料与交通 Materials and Transportations	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	4-1 4-4 5-1 5-2 10-3 11-2 12-1	
	专业外语（材料科学与工程） Professional English (Material Science and Engineering)	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	10-2 10-3	
	国家质量基础（NQI） 导论 Introduction to National Quality Foundation (NQI)	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	6-1 10-3 11-3	
专业限选课（材料服役安全工程方向） Specialized Restricted Courses	材料热处理(双语) Heat Treatment of Materials (Bilingual)	限修 Distributional Elective	2	1	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	3-3 6-3 9-1 10-2	限修 18 学分 Distributional Elective 18 credits
	材料设计与模拟 Material Design and Simulation	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-3 2-1 3-1 4-2 5-1 5-3	

专业限选课（材料服役安全工程方向） Specialized Restricted Courses	复合材料 Composite Materials	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-2 6-3
	金属功能材料 Metallic Functional Materials	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	1-4 3-1 6-1 7-3
	材料服役性能与超快诊断 Materials Performance and Ultra-fast Diagnosis	限修 Distributional Elective	2	1	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	3-3 6-3 9-1 10-2
	材料表面技术 Materials Surface Technology	限修 Distributional Elective	2	0.25	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	2-3 3-2 4-2 6-3
	无损检测技术 Non-destructive Testing Technology	限修 Distributional Elective	2	0.25	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	2-3 4-1 4-3
	可靠性工程 Reliability Engineering	限修 Distributional Elective	2	0	第 6 学期 Semester 6	材料科学与工程学院 School of Materials Science and Engineering	3-1 4-3 9-1
	材料基因工程 Materials Genome Engineering	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-2 6-3
	材料先进诊断技术 Advanced Diagnostic Technology for Materials	限修 Distributional Elective	2	0.5	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	1-4 2-3 7-2
	材料与交通 Materials and Transportations	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	4-1 4-4 5-1 5-2 10-3 11-2 12-1
	专业外语（材料科学与工程） Professional English (Material Science and Engineering)	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	10-2 10-3
	国家质量基础（NQI）导论 Introduction to National Quality Foundation (NQI)	限修 Distributional Elective	2	0	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	6-1 10-3 11-3

实践教学环节 Practice Courses								
共 19 学分，其中必修 19 学分，限修 0 学分，选修 0 学分 A total credits of 19, including 19 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
集中性实践教学环节：基本技能训练、工程实践、综合课程设计、社会与文化素质和实践、毕业实习与毕业设计 Centralized Practical Teaching Process: Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design	实验室安全与规范 A(材料科学与工程) Lab safety and Standards A (Materials Science and Engineering)A	必修 Compulsory	1	1	第 3 学期 Semester 3	材料科学与工程学院 School of Materials Science and Engineering	6-1 7-1	
	工程训练 B Engineering Training B	必修 Compulsory	1.5	1.5	第 3 学期 Semester 3	工业中心 Center of Industrial	3-2 6-1 8-2	
	认识实习 Cognitive Practice	必修 Compulsory	0.5	0.5	短 2 学期 Short Semester 2	材料科学与工程学院 School of Materials Science and	3-2 6-2 8-2	
	电子实习 Electronic Practice	必修 Compulsory	0.5	0.5	短 2 学期 Short Semester 2	电气学院 School of Electrical Engineering	1-4 4-3 5-1	
	专业实习 Specialty Practice	必修 Compulsory	1.5	1.5	短 3 学期 Short Semester 3	材料科学与工程学院 School of Materials Science and Engineering	5-2 8-2 9-2 10-1 11-2	
	工程设计 Engineering Design	必修 Compulsory	2	2	短 3 学期 Short Semester 3	材料科学与工程学院 School of Materials Science and Engineering	4-3 4-4 5-2	
	金属材料综合实验设计（金属材料方向） Metallic Material Comprehensive Experimental Design	必修 Compulsory	2	2	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	4-3 4-4 5-2	
	无机非金属材料综合实验设计（无机非金属材料方向） Inorganic Nonmetallic Material Comprehensive Experimental Design	必修 Compulsory	2	2	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	4-3 4-4 5-2	
	材料服役行为综合实验设计（材料服役安全工程方向） Material Service Behaviour Comprehensive Experimental Design	必修 Compulsory	2	2	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	4-3 4-4 5-2	
	毕业设计（论文） Graduation Design (papers)	必修 Compulsory	8	8	第 8 学期 Semester 8	材料科学与工程学院 School of Materials Science and Engineering	3-3 4-4 5-3 7-3 9-2 10-3	

创新创业实践：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 Practice: Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc	创新创业实践 Innovation and Entrepreneurship Practice	必修 Compulsory	2	2	第 7 学期 Semester 7	材料科学与工程学院 School of Materials Science and Engineering	4-1 4-4 5-1 5-2 10-3 11-2 12-1	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 School of Foreign languages
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
“第二课堂”项目：思想政治与道德素养类项目、学术科技与创新创业类项目、艺术体验与审美修养类项目、文化沟通与交往能力类项目、心理素质与身体素质类项目、社会工作与领导能力类项目、社会实践与志愿服务类项目 "The Second Lesson" Project: Ideological and Political Education and Moral Literacy Projects, Academic and Technological Innovation and Entrepreneurship Projects, Art Experience and Aesthetic Education Projects, Cultural Communication and Interpersonal Skills Projects, Psychological and Physical Health Projects, Social Work and Leadership Development Projects, Social Practice and Volunteering Projects	“第二课堂”项目 "The Second Lesson" Project	必修 Compulsory	0	0	1-8 学期 Semester 1-8	校团委 Communist Youth League Committee	8-2 9-1 12-2	

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 Comprehensive Quality Improvement Courses for College Students	必修 Compulsory	0	0	1-8 学期 Semester 1-8	校团委 Communist Youth League Committee	8-1 9-1 12-2	
	学生体质达标测评 Assessment of Students' Physical Fitness	必修 Compulsory	0	0	秋季学期 Fall semester	体育学院 School of Physical Education	8-1	
学分总计 Total Credits			161					

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	
材料科学与工程学院		材料科学与工程专业（金属、无机非金属、材料服役安全工程）		2023 级及之后年级			
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	
物理化学 A 实验	CHEM000612	1	必修	第二学期	课程名称变更为物理化学实验 A	调整课程名称	
材料表面技术	MASE017212	2	限修	第六学期	课程名称变更为材料表面技术 B（涉及到三个方向）	调整课程名称	
材料失效分析	MASE017012	2	限修	第七学期	课程名称变更为材料失效分析 B（涉及到金属和无机非两个方向）	调整课程名称	
材料失效分析实验方法（材料服役安全工程方向）	MASE020112	2	必修	第五学期	总学分由 2 学分变成 1 学分，实践由 0 学分变成 1 学分	调整学分	
材料失效学(材料服役安全工程方向)	MASE020212	1	必修	第五学期	总学分由 1 学分变成 2 学分，实践学分由 1 变成 0 学分	调整学分	
复合材料	MASE008412	2	限选	第六学期	课程名称变更为复合材料(双语)（涉及三个方向）	双语课程	
本专业专家论证意见（可另附表）：同意培养方案整体变更！							

专业负责人意见:

同意

专业负责人签名: 孙永林
2023年12月19日

教授委员会意见:

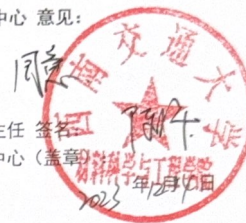
经2023年12月19日教授委员会讨论, 与会委员表决
情况如下:

同意

教授委员会主任签名:

吕复兵
2023年12月19日

学院/中心 意见:



院长/主任 签名:

学院/中心 (盖章)

开课学院/中心意见: (如变更课程非本单位需要填写本栏)

开课单位教学负责人 签名:

年 月 日