

消防工程专业培养方案

Undergraduate Program of Fire Protection Engineering

I. 专业介绍 Introduction

西南交通大学消防工程专业成立于 2004 年，是全国第三个开设消防工程专业的重点大学。专业现有教师 18 名，其中教授 3 名、副教授 7 名（含外籍教师 1 名）、高级工程师 1 名、讲师 8 名；在校本科生 400 余名，研究生 70 余人；实验中心拥有消防燃烧学实验室、防火理论与工程实验室、火灾风险评估实验室等八个专业实验室，消防实验设备 2000 余万，实验场地近 2000m²，实验室配置了 testo 烟气分析仪、多点数据采集仪、高温风速仪、热辐射对流仪等先进火灾测量和分析仪器，以及 Fluent、FDS、SIMULEX、EVACANET 等火灾及人员疏散专业计算软件。

近年来消防工程专业紧密结合工程建设和行业特点，不断加快学科专业建设，在科学研究和人才培养方面取得了极大进步，在建筑防火和交通运输火灾防治等方面独具特色。城市轨道交通专业（消防工程方向）入选国家卓越工程师教育培养计划；消防工程专业入选四川省一流专业、四川省卓越工程师教育培养计划；2017 年联合美国俄克拉荷马州立大学（OSU）开设了中外办学项目-安全消防本科专业。主持主研了国家重点研发计划项目、国家“863”计划项目、国家“973”计划项目、国家自然科学基金项目等国家级项目及省市级项目多项，发表论文 100 余篇，荣获教育部科学进步奖、中国公路学会奖、重庆市科学技术进步奖等多项；形成了建筑防火、隧道及地下空间火灾防治和材料阻燃三大研究方向。

The department of Fire Protection Engineering of Southwest Jiaotong University was established in 2004, which is the third key university in China to open this major. There are 18 full-time academic staff members in the department, including 3 professors, 7 associate professors (including 1 foreign member), 1 senior engineer and 8 lecturers; Approximately 400 undergraduate students and 70 graduate students enrolled in the department; The experimental center has eight specialized laboratories, such as Fire Combustion Laboratory, Fire Prevention Theory and Engineering Laboratory, Fire Risk Assessment Laboratory, etc. The experimental center has

invested more than 20 million, with laboratory areas of nearly 2000 m². The laboratories are equipped with Testo gas analyzers, multi-point data acquisition instrument, high temperature resistance anemometers, thermal radiation convection instrument and other advanced fire measurement and analysis instruments. Meanwhile, the laboratories also have specialized calculation software of fire and evacuation, such as Fluent, FDS, SIMULEX, EVACANET, etc.

In recent years, the department of fire protection engineering closely combines with the characteristics of engineering construction and industry, constantly accelerates the major construction. The department makes great progress in the scientific research and personnel training, with unique features of building fire prevention and fire prevention and control. The major of urban rail transportation (fire protection engineering direction) was selected as the National Excellent Engineer Education and Training Program; The major of Fire Protection Engineering has been selected as the first-class major and the Excellent Engineer Education and Training Program; In 2017, the Collaborative Bachelor's Degree Program of Fire Protection and Safety Engineering Technology between the department with Oklahoma State University (OSU) was established. The department presided over and participated in the National Key Research and Development Program, the National "863" Program Project, the National "973" Program Project, the National Natural Science Foundation of China and other national, provincial and municipal projects. The department has published more than 100 papers, won the Science Progress Award of Ministry of Education China Highway and Transportation Society Award, Chongqing Science and Technology Progress Award, etc.; formed three main research directions of building fire prevention, fire prevention and control in tunnel and underground space, and material flame retardant.

专业代码: 083102K

Program Code: 083102K

专业名称: 消防工程

Program Name: Fire Protection Engineering

II.培养目标 Objectives

消防工程专业培养热爱祖国、追求卓越、具有社会主义核心价值观、德智体美劳全面发展的消防领域的专门人才。毕业生应具有扎实的基础知识和专业技能，具有国际视野、科学素养和创新精神，能从事消防工程设计与施工、消防检测与维保、消防咨询与评估、消防安全管理、消防安全教育与培训和消防科学研究等方面的工作，成为消防工程领域的高级工程技术和管理人才。

This program aims to train professionals in the fire protection field who love the motherland, pursue excellence, and have socialist core values and comprehensive development in moral, intellectual, physical and aesthetic grounding with a hard-working spirit. Graduates should have solid basic knowledge and professional skills with global insight, scientific literacy and innovative spirit. They are qualified for works such as design and construction, inspection and maintenance of facilities or equipment, consulting and assessment, safety management, education and training and scientific research in fire protection or associated areas. They can become a senior engineering or management talent in the field of fire engineering in about five years.

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建筑领域中防火、灭火等复杂工程问题。

- 1.1 具有微积分、线性代数、概率论和数理统计的基础知识；
- 1.2 具有物理、化学等自然科学基础知识；
- 1.3 具有工程图学、电工学、工程力学、流体力学、计算机技术等工程基础知识；
- 1.4 掌握系统的消防工程专业基础知识；
- 1.5 能够将消防工程领域的基础理论和专业知识用于解决复杂消防工程问题。

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，正确识别、表达、并通过文献研究分析建筑火灾发展、材料阻燃及防灭火等复杂消防工程问题，以获得有效结论。

- 2.1 具有运用基本原理识别和表达消防工程领域复杂工程问题的能力；

2.2 能够通过文献查阅，结合所学知识，形成解决问题的初步方案；

2.3 能够运用消防工程专业知识，分析复杂工程问题并获得有效结论。

3. 设计/开发解决方案：能够研发阻燃材料及灭火试剂，设计建筑防火与人员疏散系统、烟气控制系统、水灭火系统、特殊灭火系统、自动报警及联动控制系统等复杂工程问题的解决方案，设计、评估满足特定生产工艺的消防安全流程，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。

3.1 了解并掌握工程设计的基本方法和基本技能；

3.2 能够根据对象选取适当的安全措施，确保生产安全；

3.3 能够在设计环节中体现创新意识，并考虑社会、健康、安全、法律、文化以及环境等因素。

4. 研究：能够基于科学原理并采用科学方法对火灾科学及消防工程领域复杂工程问题进行研究，包括设计实验、分析与解释数据或构建系统模型、并通过信息综合得到合理有效的结论。

4.1 掌握基础实验技能与操作方法，能够进行数据处理；

4.2 运用消防工程专业知识，设计出科学合理的实验研究方案，采用合理的数据分析方法对实验结果进行解释；

4.3 理解火灾科学及消防工程领域复杂工程问题中涉及的关键科学问题，设计并开展实验研究，对实验数据进行分析总结，通过信息综合得到合理有效结论。

5. 使用现代工具：能够针对消防领域的复杂工程问题，开发、选择与使用普适和专业的技术、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科学预测与模拟，并能够理解其局限性。

5.1 能够通过图书馆、数据库等资源进行文献检索；

5.2 能够使用计算机语言、工程图形等现代技术工具；

5.3 能够运用专业工程设计软件、先进分析测试方法等进行模拟、预测或分析，并能够理解此类工具的局限性。

6. 工程与社会：能够基于工程基本原理和相关背景知识，合理分析、评价火灾风险及防治等工程实践和复杂工程问题的解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

6.1 具备社会、健康、安全、法律及文化方面的相关背景知识；

6.2 具备合理分析和评价消防工程解决方案产生的社会、健康、安全及文化影响的专业能力；

6.3 理解消防工程师在工程实践和复杂工程问题解决方案中应承担的责任。

7. 环境与可持续发展：熟悉消防安全相关法律法规，能够理解和评价针对消防领域复杂工程问题的工程实践对环境、社会和可持续发展的影响。

7.1 了解消防领域的环境和可持续发展方面的方针、政策和法律、法规；
7.2 能够在复杂工程问题解决方案设计中综合考虑对环境和社会可持续发展的影响，并能采取措施加以改进。

8. 职业规范：了解中国国情、具有人文社会科学素养、社会责任感，能够在消防工程实践中理解并遵守工程职业道德和规范，履行消防安全社会责任，具有现代工程师的职业素质，做到责任担当、贡献国家、服务社会。

8.1 具备健全的身心素质；
8.2 掌握必备的人文与社会科学知识，养成正确的价值观，具有强烈的社会责任感；
8.3 理解并遵守消防工程职业道德和规范。

9. 个人与团队：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作用。

9.1 能够在本专业的实践课程中理解个人职责与团队目标的关系，承担好个人义务；
9.2 能够在社会实践等多学科背景下理解个人职责与团队目标的关系，承担好个人义务。

10. 沟通：能够就火灾科学与消防领域的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，能够撰写报告和设计文档、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。

10.1 能够就火灾科学与消防领域的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档、陈述发言、清晰表达或回应指令；
10.2 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。

11. 项目管理：理解并掌握工程管理原理与经济决策方法，并能在各种消防工程实践中应用，实现项目的科学管理。

11.1 理解并掌握消防工程实践中涉及的重要工程管理原理与经济决策方法；
11.2 能够将工程管理原理与经济决策方法应用于各种消防工程实践。

12. 终身学习：具有自主学习和终身学习的意识，能够针对社会和科技的发展，有不断学习和适应的能力。

12.1 具有自觉学习和终身学习的意识；
12.2 能够根据职业发展需要选择和调整学习内容，具备自我更新知识和技能的能力。

1. Engineering knowledge: The graduate should be able to make full use of the knowledge in mathematics, natural science, engineering fundamentals and specialized

courses to solve complicated problems encountering in building fire prevention and fire protection.

1.1 Have basic knowledge in Calculus, Linear Algebra, Probability Theory and Mathematical Statistics, etc.

1.2 Have knowledge in natural science, such as Physics and Chemistry, etc.

1.3 Have fundamentals knowledge in Engineering Graphics, Electrical Engineering, Engineering Mechanics, Fluid Mechanics, Computer Technology, etc.

1.4 Know well basic knowledge in fire protection engineering.

1.5 be able to make full use of the knowledge to solve complicated problems encountering in building fire prevention and protection.

2 Problem Analysis: The graduate should be able to use basic principles of Applied Mathematics, Natural Science and Engineering Science. Moreover, he/she should conduct literature reviews and then correctly identify and express the occurrence and development of fire and the propagation of smoke, as well as a number of sophisticated problems in fire prevention, so as to arrive at a feasible design solution.

2.1 Be able to identify and express the complicated problems in building fire prevention and protection by using fundamentals knowledge.

2.4 Be able to conduct literature reviews and recall previously learned knowledge to get a preliminary solution.

2.5 Be able to use the specialized knowledge in fire protection engineering, analyze the complicated problem, and finally arrive at a feasible solution.

3. Design/Develop Solutions: Ability to provide solutions to complex engineering problems such as developing fire-retardant materials and fire extinguishing agents, designing building fire prevention system / human evacuation system / smoke control system / water-based fire extinguishing system / special fire extinguishing system / automatic alarm and linkage control system. Ability to design and evaluate fire safety processes that meet specific production requirements. Innovative ideas are encouraged to be involved during design process, considering factors like society, health, safety, law, culture and environment.

3.1 Understanding and mastering the basic methods and skills of engineering design;

3.2 Selecting appropriate measures to ensure production safety;

3.3 Ability to include innovative ideas in the design process, considering complex factors like society, health, safety, law, culture, environment, etc.

4. Scientific Research: Ability to apply scientific methods to analyze complex engineering problems in fire science and fire protection engineering based on scientific principles, including designing experiments, analyzing/interpreting data or building system models, and obtaining effective conclusions through information synthesis.

4.1 Mastering basic experimental skills and operation methods, and be able to process data.

4.2 Using professional knowledge of fire protection engineering to design scientific and reasonable experimental schemes. Trying to explain experimental results by using rational data analysis method.

4.3 Understanding key scientific issues involved in complex engineering problems in fire science and fire protection engineering. Designing and conducting experimental studies, analyzing and summarizing experimental data, and finally obtaining reasonable and effective conclusions through information synthesis.

5. Use of modern tools: the ability to develop, select and use universal and specialized technologies, resources, modern engineering tools and information technology tools, including scientific predictions and simulations of complex engineering problems in fire protection field, and to understand their limitations for complex engineering problems.

5.1 Ability to use library, database and other resources for literature retrieval;

5.2 Ability to use modern technical tools such as computer language and engineering graphics;

5.3 Ability to simulate, predict, or analyze using professional engineering software, advanced analytical testing methods, etc., and to understand the limitations of such tools.

6. Engineering and Society: Be able to reasonably analyze and evaluate the social, health, safety, legal and cultural impact of fire risk and fire prevention engineering practices and complex engineering problems solutions based on the basic principles of engineering and relevant background knowledge, and understand the responsibilities.

6.2 Professional ability to reasonably analyze and evaluate the social, health, safety and cultural impact of fire protection engineering solutions;

6.3 Understand the responsibilities of fire protection engineers in engineering practices and complex engineering problem solutions.

7. Environment and Sustainability: Familiar with fire safety related laws and regulations, and capable of understand and demonstrate the environmental, social and sustainable development impacts of engineering solutions for complex engineering problems in the fire protection field.

7.1 Understand the environmental, sustainable development guidelines, regulations, policies and laws and in the field of fire protection;

7.2 Capable of consider the impact on environmental and social sustainability in the design of complex engineering problem solutions and take steps to improve them.

8. Ethics: Understand China's national conditions, have humanities, science literacy, and social responsibility, be able to understand and commit to engineering professional ethics and norms in fire engineering practice, fulfill fire safety social responsibility, have the professional qualities of modern engineers, and fulfill their responsibilities, contribute to the country and serve the society.

8.1 Have a sound physical and mental quality;

8.2 Master the necessary humanities and social science knowledge, develop correct values, and have a strong sense of social responsibility;

8.3 Understand and abide by fire engineering ethics and practices.

9. Individuals and teams: be able to fulfill the roles of individuals, team members, and team leaders in multi-disciplinary context.

9.1 Be able to understand the relationship between personal responsibility and team goals in practical courses of this major, and fulfill personal obligations properly;

9.2 Be able to understand the relationship between personal responsibility and team goals in social practice and other multi-disciplinary context, and fulfill personal obligations properly.

10. Communication: be able to effectively communicate with colleagues and the public on complex engineering issues in the field of fire science and fire protection, write reports and design documents, make presentations, clearly express or respond to instructions; have an international perspective and be able to communicate in a cross-cultural context.

10.1 Be able to effectively communicate with colleagues and the public on complex engineering issues in the field of fire science and fire protection, including writing reports and design documents, presenting statements, and clearly expressing or responding to instructions;

10.2 Have an international perspective, and be able to communicate in a cross-cultural context.

11. Project management: Understand and master the principles of engineering management and economic decision-making, and apply it in various fire engineering practices to achieve scientific management of the project.

11.1 Understand and master the important engineering management principles and economic decision-making methods involved in fire engineering practice;

11.2 Be capable of applying engineering management principles and economic decision-making methods to various fire engineering practices.

12. Lifelong learning: Have the ability to continuously learn and adapt to the development of society and technology with awareness of independent learning and lifelong learning.

12.1 Have the awareness of independent learning and lifelong learning;

12.2 Can select and adjust learning content based on career development needs with the ability to self-renew knowledge and skills.

IV.学制与学位 Duration and Degree

学制： 四年 Duration: Four Years

学位： 工学 Degree: Bachelor of Engineering

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

主干学科： 安全科学与工程、土木工程

Main Subject: Safety Science and Engineering Civil Engineering

专业核心课程： 消防法规、消防燃烧学、防排烟工程、消防给水工程、火灾探测与报警系统、特殊灭火系统、建筑性能化防火设计、阻燃技术、电气防火技术、火灾风险与保险、火灾调查、火灾动力学、建筑结构抗火设计、消防工程概预算、工业企业防火。

Specialized Core Course: Fire Control Laws, Fire Protection Combustion , Smoke Prevention and Exhausting Engineering, Fire Water Supply Engineering, Fire Detection and Alarm System, Especial Fire Extinguishing system, Performance-based fire protection design of building, Flame Retardant Technology, Electrical Fire Prevention Technology, Fire Risk and Insurance, Fire Investigation, Fire Dynamics, Design on Fire Safety of Building Structure, Estimate and Budget for Fire Protection Project, Industrial fire protection.

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						小计 Subtotal
		必修 Compulsory		限修 Distributional Electives		选修 Free Electives		
		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）					4		4
	多元化课程 Diversified Courses							
	国际课程 International Courses							
	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			2			2	
	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	17		2				19
	物理类 Physics Courses	6						6
	计算机基础类 Basic Computer Courses	4.5	1.5					6
	化学类 Chemistry Courses	4						4
专业教育课程 Specialized Courses	专业核心课 Specialized Core Course	37	1.0					38
	专业限修课 Specialized Restricted Courses			12				12

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		31					31
	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	8.1、8.2、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 Semester 2	马克思主义学院 School of Marxism	8.1、8.2、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、8.2、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 4 学期 Semester 4	马克思主义学院 School of Marxism	8.1、8.2、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 Semester 6	马克思主义学院 School of Marxism	8.1、8.2、12.1	
	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	8.1、8.2、12.1	
	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	8.1、8.2、12.1	
	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	8.1、8.2、12.1	
	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	8.1、8.2、12.1	
	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	8.1、8.2、12.1	
	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	8.1、8.2、12.1	

	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	8.1、8.2、12.1	
	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	8.1、8.2、12.1	
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	6.1、8.1、8.2	
	军事技能 Military Skills	必修 Compulsory	2	2	短 1 学期 Short Semester 1	武装部 Security Office	6.1、8.1、8.2	
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	5.1、10.1、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	5.1、10.1、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	5.1、10.1、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	5.1、10.1、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 2 学分，选修 4 学分 A total credits of 10, including 4 for compulsory courses, 2 for distributional electives and 4 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	4	0	2-8 学期 Semester 2-8	全校 The whole school	8.1、8.2	限选 4 学分 Distributional Elective 4 credits
多元化课程 Diversified Courses	多元化课程 Diversified Courses					全校 The whole school	8.1、8.2	
国际课程 International Courses	国际课程 International Courses					全校 The whole school	8.1、8.2	
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					全校 The whole school	8.1、8.2	
学生成长与发展规划课程 Student Growth and Development Planning Courses	水资源与水环境概论 Introduction to water resource and water environment	限修 Distributional Elective	2	0	第 1 学期 Semester 1	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	7.1、7.2	限修 1 门，2 学分 Limited to 1 course, 2 credits
	固体废物与可持续发展 Solid waste and sustainable development							
	绿色化学与环境保护 Green chemistry and environmental protection							
	生态保护与可持续发展 Ecological protection and sustainable development							
	火灾科学与消防技术 Fire Science and Prevention Technology							
	环境保护与消防安全 Environmental Protection and fire safety							
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	8.1、8.2	
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	全校 The whole school	8.1、8.2	

学科与专业基础课程 Discipline and Specialty foundational Courses 共 35 学分，其中必修 33 学分，限修 2 学分，选修 0 学分 A total credits of 35, including 33 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
数学类 Mathematics Courses	高等数学 I Higher Mathematics I	必修 Compulsory	5	0	第 1 学期 Semester 1	数学学院 School of Mathematics	1.1、2.1	
	高等数学 II Higher Mathematics II	必修 Compulsory	5	0	第 2 学期 Semester 2	数学学院 School of Mathematics	1.1、2.1	
	线性代数 A Linear Algebra A	必修 Compulsory	4	0	第 1 学期 Semester 1	数学学院 School of Mathematics	1.1、2.1	
	概率论与数理统计 Probability Theory and Mathematical Statistics	必修 Compulsory	3	0	第 3 学期 Semester 3	数学学院 School of Mathematics	1.1、2.1	
	数学建模 mathematical modeling	限修 Distributional Elective	2	0	第 4 学期 Semester 4	数学学院 School of Mathematics	1.1、2.1、3.3	限修 1 门, 2 学分 Limited to 1 course, 2 credits
	复变函数与积分变换 Complex Variable Function and Integral Transform	限修 Distributional Elective	3	0	第 4 学期 Semester 4	数学学院 School of Mathematics	1.1、2.1	
物理类 Physics Courses	大学物理 BI College Physics BI	必修 Compulsory	3	0	第 2 学期 Semester 2	物理科学与技术学院 School of Physical and Technology	1.2、2.2	
	大学物理 BII College Physics BII	必修 Compulsory	3	0	第 3 学期 Semester 3	物理科学与技术学院 School of Physical and Technology	1.2、2.2	
计算机基础类 Basic Computer Courses	计算机程序设计基础 Fundamentals 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	1.2、5.2、5.3	
	土木工程制图及计算机绘图 Civil Engineering Drawing and Computer Drawing	必修 Compulsory	3	0.5	第 2 学期 Semester 2	土木工程学院 School of Civil Engineer	1.3、2.2、3.3、5.2	
化学类 Chemistry Courses	无机及分析化学 BI Inorganic and Analytical Chemistry BI	必修 Compulsory	2	0	第 1 学期 Semester 1	化学学院 School of Chemistry	1.1、2.2	
	无机及分析化学 BII Inorganic and Analytical Chemistry BII	必修 Compulsory	2	0	第 2 学期 Semester 2	化学学院 School of Chemistry	1.1、2.2	

专业教育课程 Specialized Courses 共 50 学分，其中必修 38 学分，限修 12 学分，选修 0 学分 A total credits of 50, including 38 for compulsory courses, 12 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	房屋建筑学 Building Architecture	必修 Compulsory	2	0	第 2 学期 Semester 2	建筑学院 School of Architecture	1.4、2.1	
	理论力学 C Theoretical mechanics C	必修 Compulsory	3	0	第 3 学期 Semester 3	力学与航空航天学院 School of Mechanics and Aerospace Engineering	1.3、4.1、4.2	
	材料力学 C Mechanics of Materials 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 Aerospace Engineering	1.3、4.1、4.2	
	电工技术与电气工程 Electrical Technology and Electrical Engineering	必修 Compulsory	2	0	第 4 学期 Semester 4	电气工程学院 School of Electrical Engineering	1.3、3.3	
	工程流体力学 B Engineering Fluid Mechanics B	必修 Compulsory	2	0	第 3 学期 Semester 3	土木工程学院 School of Civil Engineer	1.3、4.1	
	工程热力学与传热学 Engineering Thermodynamics and Heat Transfer Theory	必修 Compulsory	3	0	第 3 学期 Semester 3	机械工程学院 School of Mechanical and Technology	1.3、4.1	
	消防法规 Fire Control Laws	必修 Compulsory	2	0	第 3 学期 Semester 3	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.3, 6.1, 6.2, 6.3, 8.1, 8.2, 8.3	
	消防燃烧学 Fire Protection Combustion	必修 Compulsory	2	0	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1、1.2、1.4、1.5、2.2、2.3、4.1~4.3、8.2、8.3、10.1、12.2	

专业核心课 Specialized Core Course	安全系统工程 Safety System Engineering	必修 Compulsory	2	0	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.1, 3.2, 3.3, 6.1, 6.2, 6.3, 11.1, 11.2	
	建筑防火 Building Fire Prevention	必修 Compulsory	2	0	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.2、6.3、7.1、8.3、9.1、10.1、10.2、11.1、11.2、12.1	
	建筑设备 A Architecture Equipment A	必修 Compulsory	3	0	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.5、3.1、12.2	
	火灾探测与报警系统 Fire Detection and Alarm System	必修 Compulsory	2	0	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、1.5、2.1~2.3、3.1~3.3、6.3、8.3、9.1、12.2	
	火灾动力学（双语） Fire Dynamics (bilingual)	必修 Compulsory	2	0	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1~1.5、2.1~2.3、3.2、4.3、6.1~6.3、8.2~8.3、9.1~9.2、10.1、10.2、12.2	
	防排烟工程 Smoke Prevention and Exhausting Engineering	必修 Compulsory	2	0.5	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.2、6.3、7.1、8.3、9.1、10.1、10.2、11.1、11.2、12.1	
	消防给水工程 Fire Water Supply Engineering	必修 Compulsory	2	0.5	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.2、6.3、7.1、8.3、9.1、10.1、10.2、11.1、11.2、12.1	
	建筑性能化防火设计 Performance-based Fire Protection Design for Building	必修 Compulsory	2	0	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、1.5、2.1~2.3、3.1~3.3、4.3、6.1、6.3、7.1、8.2、8.3	
	工业企业防火 Industrial Fire Protection	必修 Compulsory	2	0	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.2、2.3、3.2、6.1、7.2、11.1	

专业限选课 Specialized Restricted Courses	火灾风险与保险 Fire Risk and Insurance	限修 Distributional Elective	2	0	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.3、4.2、 4.3、6.2	限修 6 门, 12 学 分 Limited to 6 courses, 12 credits
	阻燃技术 Flame Retardant Technology	限修 Distributional Elective	2	0	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1、1.2、 3.2、8.2、 8.3、10.1、 10.2	
	特殊灭火系统 Special Fire Extinguishing System	限修 Distributional Elective	2	0	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、1.5、 2.1~2.3、 3.1~3.3、 6.3、8.3、 9.1、12.2	
	消防规划学 Fire Protection Planning	限修 Distributional Elective	2	0	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.5、3.1、 10.1、12.2	
	电气防火技术 Electrical Fire Prevention Technology	限修 Distributional Elective	2	0	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.2、8.2、 8.3、9.1、 11.1、12.2	
	建筑结构防火设计 Design on Fire Safety of Building Structure	限修 Distributional Elective	2	0	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、2.3、 10.1、12.1	
	隧道通风排烟及人员疏散 Ventilation and Evacuation of Tunnel	限修 Distributional Elective	2	0	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、2.3、 10.1、12.1	
	火灾调查 Fire Investigation	限修 Distributional Elective	2	0	第 7 学期 Semester 7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	4.1~4.3、 5.1~5.3、 8.2~8.3	
	消防工程概预算 Estimate and Budget for Fire Protection Project	限修 Distributional Elective	2	0	第 7 学期 Semester 7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.2、5.2、 5.3、6.3、 7.1、8.3、 9.1、10.1、 10.2、11.1、 11.2、12.1	
	消防设备施工与智慧检测 Fire equipment construction and intelligent testing	限修 Distributional Elective	2	0	第 7 学期 Semester 7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.2、5.2、 5.3、6.3、 7.1、9.1、 10.2、11.1、 12.1	

实践教学环节 Practice 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
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	无机及分析化学实验 BI Inorganic and Analytical Chemistry Experiment B I	必修 Compulsory	0.5	0.5	第 1 学期 Semester 1	化学学院 School of Chemistry	1.2、2.2、7.2	
	无机及分析化学实验 BII Inorganic and Analytical Chemistry Experiment B II	必修 Compulsory	0.5	0.5	第 2 学期 Semester 2	化学学院 School of Chemistry	1.2、2.2、7.2	
	大学物理实验I College Physics Experimentation I	必修 Compulsory	1	1	第 2 学期 Semester 2	物理科学与技术学院 School of Physical and Technology	1.2、2.2、	
	大学物理实验II College Physics Experimentation II	必修 Compulsory	1	1	第 3 学期 Semester 3	物理科学与技术学院 School of Physical and Technology	1.2、2.2	
	电工技术与电气工程实验 Electrical Technology and Electrical Engineering Experimentation	必修 Compulsory	1	1	第 4 学期 Semester 4	电气工程学院 School of Electrical Engineering	1.3、3.3	
	工程热力学与传热学实验 Engineering Thermodynamics and Heat Transfer Theory Experimentation	必修 Compulsory	1	1	第 3 学期 Semester 3	机械工程学院 School of Mechanical and Technology	1.3、4.1	
	消防燃烧学实验 Combustion Fundamentals of Fire Experiment	必修 Compulsory	1	1	第 4 学期 Semester 4	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.1、1.2、1.4、4.1、4.2、8.2、8.3、9.1、9.2	
	火灾探测与报警系统实验 Fire Detection and Alarm System Experimentation	必修 Compulsory	1	1	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、1.5、3.1、4.1、4.2、6.3、8.3、9.1、10.1	
	火灾动力学实验 Fire Dynamics Experimentation	必修 Compulsory	1	1	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.4、2.1~2.3、4.1~4.3、5.1、5.2、6.2、8.2、9.1、9.2、10.1、12.2	
	消防给水工程实验 Fire Water Supply Engineering Experimentation	必修 Compulsory	1	1	第 5 学期 Semester 5	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.2、3.3、4.1~4.3、6.1、7.1	

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	消防系统设计实践 Practon of Fire Protection Sysen Design	必修 Compulsory	3	3	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.1~2.3、3.3、4.2、4.3、6.1、7.1	
	消防数值模拟技术 Numerical Simulation Technology for Fire Protection	必修 Compulsory	3	3	第 6 学期 Semester 6	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	3.1、4.1~4.3、5.1~5.3、8.1、8.2、9.1、9.2、10.1、10.2	
	建筑防火审验实践 Design review on fire protection design of buildings	必修 Compulsory	4	4	第 7 学期 Semester 7	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.1~2.3、3.3、4.2、4.3、6.1、7.1	
	计算机绘图实训 Civil Engineering Drafting Practice	必修 Compulsory	1	1	短 1 学期 Short Semester 1	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	1.3、2.1、5.2	
	认识实习 Cognition Practice	必修 Compulsory	1	1	短 2 学期 Short Semester 2	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	2.1、2.2、4.3、6.1、6.2、7.1、8.2、8.2	
	生产实习 Production Practice	必修 Compulsory	2	2	短 3 学期 Short Semester 3	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	6.1、6.2、8.1~8.3、11.1、11.2	
	毕业设计（论文）-消防 Graduation Design (dissertation) -Fire Protection	必修 Compulsory	8	8	第 8 学期 Semester 8	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	所有指标点 All Indicators	
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	创新创业训练计划项目 Innovation and Entrepreneurship Training Program	限修 Distributional Elective	2	2	7-8 学期 Semester 7-8	地球科学与环境工程学院 Faculty of Geosciences and Environmental Engineering	9.1、9.2、9.3、9.4、11.1、11.2、11.3	主持或参与结题至少 1 项 Leading or participation at least one project conclusion
	个性化实验 Personalized Experiments	限修 Distributional Elective						
	学科竞赛 Subject Competition	限修 Distributional Elective						
	创新讲座 Innovation Lecture	限修 Distributional Elective				全校 The whole school		

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 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	8.1、8.2、10.1、10.2、12.1	
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、8.2、10.1、10.2、12.1	
	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					