

化学专业培养方案

Undergraduate Program of Chemistry

I. 专业介绍 Introduction

化学是一门以实验为基础的自然科学，在原子、分子、纳米等跨尺度、多层次上研究物质世界的组成、结构、性质、互作过程和演变规律。为了满足国家经济、社会、科技和产业发展对化学专业人才的需求，本专业以加强基础学科建设为导向，突出科学布局、交叉融合的学科和专业发展特点，为国家培养基础型、有创新能力的化学专业人才。同时，本专业将面向化学在社会各领域的新内涵、新要求、新问题、新趋势、新技术和新业态需求，整合西南交通大学的优势资源，打造高水平、国际化、有特色的化学专业。

Chemistry is a natural science based on experiments, which studies the composition, structure, properties, interaction processes, and evolution laws of the material world at multiple scales and levels, such as atoms, molecules, and nanometers. In order to meet the needs of national economic, social, technological, and industrial development for chemical professionals, this major is guided by strengthening the construction of basic disciplines, highlighting the characteristics of scientific layout, interdisciplinary integration, and professional development, and trains basic and innovative chemical talents for the country. At the same time, this major will cater to the new connotations, requirements, problems, trends, technologies, and business needs of chemistry in various fields of society, integrating the advantageous resources of Southwest Jiaotong University, and create a high-level, international, and distinctive chemistry major.

专业代码: 070301

Program Code: 070301

专业名称: 化学

Program Name: Chemistry

II. 培养目标 Objectives

贯彻党的教育方针，适应新时代中国特色社会主义事业建设对高等教育的要求，培养为国家富强和民族振兴而奋斗、德智体美全面发展的建设者和接班人。

融入学校“价值塑造、人格养成、能力培养、知识探究”四维一体培养体系，为教育、科技和经济行业培养从事教学、研究和管理工作的拔尖创新人才。

依托西南交通大学创办交通特色鲜明的综合性研究型一流大学的目标，培养学生培养具有优秀的思想品德、健康的心理素质、良好的文化素养和强烈的社会责任感。接受系统的科学思维培养和科学研究训练，掌握宽厚的化学专业理论知识，熟悉化学的基本思维方法和研究手段；拥有熟练的专业实验实践技能，具备一定的工程技术知识，具有在实践中分析问题和解决问题的能力。掌握国际化信息交流、收集和整理的工具、方法和手段；了解专业发展

前景、有创新精神和国际视野；具有终身学习能力，具有进一步深造的基础和发展的潜能。本专业将为学校土木、材料、环境、生物医药等学科输送具有化学基础的人才，为国家破解“卡脖子”难题做好化学基础人才培养。

Implement the Party's educational policy, adapt to the requirements of higher education for the construction of socialism with Chinese characteristics in the new era, and cultivate builders and successors who strive for national prosperity and national rejuvenation, and develop comprehensively in morality, intelligence, physical fitness, and aesthetics.

Integrate into the school's four-dimensional integrated training system of "value shaping, personality development, ability development, and knowledge exploration" to cultivate top-notch innovative talents engaged in teaching, research, and management in the education, technology, and economic industries.

Relying on the goal of establishing a comprehensive research-oriented first-class university with distinctive transportation characteristics at Southwest Jiaotong University, we aim to cultivate students with excellent ideological and moral character, healthy psychological qualities, good cultural literacy, and a strong sense of social responsibility. Students will accept systematic scientific thinking and research training, master broad theoretical knowledge of chemistry, and be familiar with the basic thinking methods and research methods of chemistry. They will possess proficient professional experimental and practical skills, possess certain engineering and technical knowledge, and have the ability to analyze and solve problems in practice. They will master the tools, methods, and means for international information exchange, collection, and organization. They will understand professional development prospects; have innovative spirit, and an international perspective. They will have lifelong learning ability; possess the foundation for further education and potential for development. This major will provide students with a foundation in chemistry for disciplines such as civil engineering, materials, environment, and biomedicine in the school, and help the country solve the "bottleneck" problem by cultivating basic chemistry talents.

III. 专业毕业要求 Graduation Requirements

1. 思想政治和德育

1.1 热爱社会主义祖国，拥护中国共产党的领导，对学生进行中华民族优秀传统文化教育、社会主义民主与法制教育和社会公德与文明礼仪教育。

1.2 学习习近平新时代中国特色社会主义思想、马列主义、毛泽东思想、邓小平理论以及“三个代表”重要思想，逐步树立正确的世界观和人生观，掌握辩证唯物论的思维方法。

1.3 对学生进行集体主义教育，树立正确的价值观和道德观，具有高尚的思想品德。

1.4 培养学生的竞争意识，以适应新时代人才培养新形式。

1. Ideological and Political Education and Moral Education

1.1 Love the socialist motherland, support the leadership of the CPC, and educate students on the excellent culture of the Chinese nation, Socialist Democracy and legal system, and social morality and civilized etiquette.

1.2 Learn from Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Marxism-Leninism, Mao Zedong Thought, Deng Xiaoping Theory and Theory of Three Represents, gradually establish a correct world outlook and outlook on life, and master dialectical materialist thinking methods.

1.3 Carry out collectivism education for students, establish correct values and moral values, and have noble ideological morality.

1.4 Cultivate students' competitive awareness to adapt to the new forms of talent cultivation under the reform and opening up.

2. 体育

2.1 了解体育的基本知识，掌握科学锻炼身体的基本技能，达到国家规定的大学生体育合格标准。

2.2 养成良好的体育锻炼和卫生习惯，身心健康。

2. Sports

2.1 Understand the basic knowledge of sports, master the basic skills of scientific physical exercise, and meet the national standards for qualified college students in sports.

2.2 Develop good physical exercise and hygiene habits, and maintain physical and mental health.

3. 人文素养与职业道德

3.1 通过文学、艺术教育，陶冶学生的情操和审美观，具有健康的心理素质。

3.2 具有科学精神，遵守职业道德和规范，践行社会主义核心价值观。

3. Humanities and Professional Ethics

3.1 Through literature and art education, cultivate students' sentiments and aesthetic values, and possess healthy psychological qualities.

3.2 Have a scientific spirit, abide by professional ethics and norms, and practice socialist core values.

4. 专业知识与能力

4.1 系统地、扎实地掌握本专业所必须的化学的基本理论、基本知识和基本实验技能，具有初步的土木、生命、环境、材料等学科的化学基础知识。

4.2 掌握本专业所必须的数学、物理学的基本理论和实验的基本技能。

4.3 熟悉计算机操作系统，掌握一门以上计算机高级语言，具有较熟练的程序编制和应用软件能力。

4.4 较好地掌握一门外国语，能阅读本专业外文书刊，有初步的听、说、读、写能力。

4.5 掌握化学某些方向的专业知识，受到应用、开发性研究的基本训练，知识面较广，有较强的适应性和一定创新能力，对化学某些应用领域的前沿、发展趋势有所了解。

4.6 具有较强的自我获取知识、更新知识和拓展知识的能力。掌握国际化信息交流、收

集和整理的工具、方法和手段，了解专业发展前景，有创新精神和国际视野，具有进一步深造的基础和发展潜能。掌握文献检索方法，能运用计算机、多媒体手段、信息高速公路技术获取、传递新知识、新信息。

4.7 初步了解生产实际，具有将化学基本理论知识与生产实际相结合和分析、解决与化学相关的实际问题的初步能力。

4. Professional Knowledge and Abilities

4.1 Systematically and solidly grasp the basic theories, knowledge, and experimental skills of chemistry required for this major, and possess preliminary chemical basic knowledge in disciplines such as civil engineering, life, environment, and materials.

4.2 Master the basic theories and experimental skills of mathematics and physics necessary for the specialty.

4.3 Be familiar with the computer operating system, master more than one computer high-level programming language, and have relatively skilled programming and application software capabilities.

4.4 Have a good grasp of a foreign language, be able to read foreign books and magazines in this major, and have preliminary listening, speaking, reading, and writing abilities.

4.5 Master professional knowledge in certain fields of chemistry, receive basic training in applied and developmental research, have a wide range of knowledge, strong adaptability, and certain innovative abilities, and have an understanding of the forefront and development trends in certain application fields of chemistry.

4.6 Possess strong ability to acquire knowledge, update knowledge, and expand knowledge. Master the tools, methods, and means for international information exchange, collection, and organization, understand the prospects of professional development, have an innovative spirit and international perspective, and have the foundation and development potential for further education. Master literature retrieval methods, be able to use computers, multimedia means, and information highway technology to obtain and transmit new knowledge and information.

4.7 Preliminary understanding of production practice, with the ability to combine basic theoretical knowledge of chemistry with production practice, analyze, and solve practical problems related to chemistry.

5. 沟通与合作能力

5.1 具有良好的沟通能力。

5.2 具有良好的团队合作能力。

5. Communication and Cooperation Skills

5.1 Possess good communication skills.

5.2 Possess good teamwork skills.

6. 国际视野

6.1 了解本专业国际动态与发展。

6.2 具有国际理解能力与视野。

6.3 理解和尊重世界不同文化的差异性。

6. International Perspective

6.1 Understand the international dynamics and development of this major.

6.2 Possess international understanding and vision.

6.3 Understand and respect the differences of different cultures in the world.

IV.学制与学位 Duration and Degree

学制：四年 Duration: 4 years

学位：理学学士 Degree: Bachelor of Science

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

主干学科：化学

Main Subject: Chemistry

专业核心课程：无机化学、分析化学、有机化学、物理化学、结构化学、仪器分析、化工原理、高分子化学与物理等课程

Specialized Core Course: Inorganic Chemistry, Analytical Chemistry, Organic Chemistry, Physical Chemistry, Structural Chemistry, Instrumental Analysis, Principles of Chemical Engineering, Polymer Chemistry and Physics, etc.

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）							
	多元化课程 Diversified Courses							
	国际课程 International Courses					6		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	7						7
	物理类 Physics Courses	6	2					8
	计算机基础类 Basic Computer Courses	2	1					3
	专业基础课 Professional Foundational Courses	21	17					38
专业教育课程 Specialized Courses	专业核心课 Specialized Core Course	17.5	6.5					24
	专业限选课 Specialized Restricted Courses			10				10
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		16					16

	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							151

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	1.1, 1.3	
	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	1.1	
	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	1.2	
	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	1.2	
	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	1.2	
	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	1.4, 6.2, 6.3	
	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	1.4, 6.2, 6.3	
	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	1.4, 6.2, 6.3	
	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	1.4, 6.2, 6.3	
	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	1.4, 6.2, 6.3	
	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	1.4, 6.2, 6.3	

	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	1.4, 6.2, 6.3	
	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	1.4, 6.2, 6.3	
军事类 Military Courses	军事理论 Military Theories	必修 Compulsory	2	0	短 1 学期 Short Semester 1	武装部 Security Office	1.1	
	军事技能 Military Skills	必修 Compulsory	2	2	第 1 学期 Semester 1	武装部 Security Office	1.1	
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	4.4, 5.1	
	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	4.4, 5.1	
	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	4.4, 5.1	
	职场英语 Workplace English	限修 Distribution al Elective	2	0	第 4 学期 Semester 4	外国语学院 School of Foreign languages	4.4, 5.1	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	2.1	
	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	2.1	
	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	2.1	
	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	2.1	
	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	2.2	
	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	2.2	

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 Elective	6	0	2-8 学期 Semester 2-8	全校 The whole school	3.2, 6.2	
多元化课程 Diversified Courses	多元化课程 Diversified Courses			0		全校 The whole school	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	
国际课程 International Courses	国际课程 International Courses			0		全校 The whole school	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	
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			0		全校 The whole school	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	
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			0		全校 The whole school	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	
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	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	
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	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	
学科与专业基础课程 Discipline and Specialty foundational Courses 共 56 学分，其中必修 56 学分，限修 0 学分，选修 0 学分 A total credits of 56, including 56 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	微积分 Calculus	必修 Compulsory	5	0	第 1 学期 Semester 1	数学学院 School of Mathematics	4.2	
	线性代数初步 Elementary Linear Algebra	必修 Compulsory	2	0	第 2 学期 Semester 2	数学学院 School of Mathematics	4.2	
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 Physics	4.2	

	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 Physics	4.2	
	大学物理实验 I College Physics Experiment I	必修 Compulsory	1	1	第 2 学期 Semester 2	物理科学与技术学院 School of Physics	4.2	
	大学物理实验 II College Physics Experiment II	必修 Compulsory	1	1	第 3 学期 Semester 3	物理科学与技术学院 School of Physics	4.2	
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	4.3	
专业基础课 Professional Foundational Courses	无机化学 I Inorganic Chemistry I	必修 Compulsory	4	0	第 1 学期 Semester 1	化学学院 School of Chemistry	4.1	
	无机化学 II Inorganic Chemistry II	必修 Compulsory	2	0	第 2 学期 Semester 2	化学学院 School of Chemistry		
	分析化学 I Analytical Chemistry I	必修 Compulsory	2	0	第 2 学期 Semester 2	化学学院 School of Chemistry	4.1	
	分析化学 II Analytical Chemistry II	必修 Compulsory	2	0	第 3 学期 Semester 3	化学学院 School of Chemistry		
	有机化学 I Organic Chemistry I	必修 Compulsory	3	0	第 3 学期 Semester 3	化学学院 School of Chemistry	4.1	
	有机化学 II Organic Chemistry II	必修 Compulsory	3	0	第 4 学期 Semester 4	化学学院 School of Chemistry		
	物理化学 I Physical Chemistry I	必修 Compulsory	3	0	第 4 学期 Semester 4	化学学院 School of Chemistry	4.1	
	物理化学 II Physical Chemistry II	必修 Compulsory	2	0	第 5 学期 Semester 5	化学学院 School of Chemistry		
	无机化学实验 I Experiments of Inorganic Chemistry I	必修 Compulsory	2	2	第 1 学期 Semester 1	化学学院 School of Chemistry	4.1	
	无机化学实验 II Experiments of Inorganic Chemistry II	必修 Compulsory	2	2	第 2 学期 Semester 2	化学学院 School of Chemistry	4.1	
	分析化学实验 I Experiments of Analytical Chemistry I	必修 Compulsory	2	2	第 2 学期 Semester 2	化学学院 School of Chemistry	4.1	
	分析化学实验 II Experiments of Analytical Chemistry II	必修 Compulsory	2	2	第 3 学期 Semester 3	化学学院 School of Chemistry	4.1	
	有机化学实验 I Experiments of Organic Chemistry I	必修 Compulsory	3	3	第 3 学期 Semester 3	化学学院 School of Chemistry	4.1	
	有机化学实验 II Experiments of Organic Chemistry II	必修 Compulsory	2	2	第 4 学期 Semester 4	化学学院 School of Chemistry	4.1	
	物理化学实验 I Experiments of Physical Chemistry I	必修 Compulsory	2	2	第 4 学期 Semester 4	化学学院 School of Chemistry	4.1	
	物理化学实验 II Experiments of Physical Chemistry II	必修 Compulsory	2	2	第 5 学期 Semester 5	化学学院 School of Chemistry	4.1	

专业教育课程 Specialized Courses 共 34 学分，其中必修 24 学分，限修 10 学分，选修 0 学分 A total credits of 34, including 24 for compulsory courses, 10 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	实验室安全与规范 Lab Safety and Standards	必修 Compulsory	1	0.5	第 3 学期 Semester 3	化学学院 School of Chemistry	4.1, 4.2	
	结构化学 Structural Chemistry	必修 Compulsory	3	0	第 5 学期 Semester 5	化学学院 School of Chemistry	4.1	
	化工原理 A Principles of Chemical Engineering A	必修 Compulsory	4	0	第 5 学期 Semester 5	化学学院 School of Chemistry	4.1	
	生物化学 Biochemistry	必修 Compulsory	4	0	第 6 学期 Semester 6	化学学院 School of Chemistry	4.1	
	仪器分析 Instrumental Analysis	必修 Compulsory	3	0	第 6 学期 Semester 6	化学学院 School of Chemistry	4.1	
	仪器分析实验 Instrumental Analysis Experiment	必修 Compulsory	3	3	第 6 学期 Semester 6	化学学院 School of Chemistry	4.1	
	高分子化学与物理 Polymer Chemistry and Physics	必修 Compulsory	3	0	第 6 学期 Semester 6	化学学院 School of Chemistry	4.1	
	化学综合实验 Comprehensive Chemistry Experiment	必修 Compulsory	3	3	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5, 4.6, 4.7	
专业限选课 Specialized Restricted Courses	合成化学 Synthetic Chemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5, 4.7	限修 10 学分 Distributional Elective 10 credits
	配位化学 Coordination Chemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5	
	有机立体化学 Organic Stereochemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5	
	计算化学 Computational Chemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5	
	能源化学 Energy Chemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5, 4.7	
	材料化学 Materials Chemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5, 4.7	
	应用电化学 Applied Electrochemistry	限修 Distributional Elective	2	0	第 7 学期 Semester 7	化学学院 School of Chemistry	4.1, 4.5, 4.7	

实践教学环节 Practice Courses								
共 18 学分，其中必修 16 学分，限修 2 学分，选修 0 学分 A total credits of 18, including 16 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	本科毕业论文 Bachelor's Degree Thesis	必修 Compulsory	16	16	第 8 学期 Semester 8	化学学院 School of Chemistry	4.1, 4.5, 4.6, 4.7, 5.1, 5.2, 6.1	
	创新创业训练计划项目 (Innovation and Entrepreneurship Training Program)	限修 Distributional Elective	2	2	3-7 学期 Semester 3-7	化学学院 School of Chemistry	1.4, 3.1, 3.2, 4.6, 5.1, 5.2	主持或参与结题至少 1 项 (Leading or Participating at least one project conclusion)
	个性化实验 (Individual Experiment)							主持或参与结题至少 1 项 (Leading or Participating at least one project conclusion)
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	重点实验室向本科生开放工程实践项目 (Engineering Practice Projects of Key laboratories Opening to Undergraduates)							主持或参与结题至少 1 项 (Leading or Participating at least one project conclusion)

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	学科竞赛（国家级/省级大学生化学实验邀请赛，中国国际“互联网+”大学生创新创业大赛，全国大学生节能减排社会实践与科技竞赛，全国大学生化工设计大赛，四川省材料设计大赛）（Subject Competition, National/Provincial Undergraduate Chemical Experiment invitational competition, China International College Students Innovation and Entrepreneurship Competition, National Undergraduate Energy Conservation and Emission Reduction Social Practice and Technology Competition, Undergraduate Chemical Engineering Design Competition, SiChuan Material Design Competition）							竞赛三等奖以上 (Winning the third Prize at the 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
“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	1.1, 1.3, 3.1, 3.2	

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	1.3, 1.4, 3.2, 5.1, 5.2	
	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	2.1, 2.2	
学分总计 Total Credits			151					