

应用化学专业2021级本科人才培养方案

一、专业基本信息

学科门类：	理学	专业代码：	070302
授予学位：	理学学士	标准学制：	四年
毕业学分要求：	165学分		

二、培养目标与培养要求

1. 培养目标

面向以化妆品为代表的日用化学行业，培养拥有坚定民族精神和家国情怀，具有良好的科学精神、人文修养、职业素养和社会责任感，系统扎实地掌握化学基础知识、基本理论和研究方法，掌握化妆品科学、表面活性剂化学等专业知识，富有较强的创新意识、实践能力和国际化视野，能解决本学科及相关学科交叉领域中的科学技术问题，能在日用化学等相关领域从事科学研究、技术开发、生产及管理等工作的高层次复合型应用化学专业人才。

本专业毕业生具有如下目标预测：

- (1) 能够运用所学的化学基础知识和化妆品科学、表面活性剂化学等专业知识，以多学科视角为日用化学行业提供科学解决方案；
- (2) 能承担化妆品、洗涤剂等日用化学品的研发和实施，为研发项目的运行和管理提供技术支持；
- (3) 具备较强组织和领导能力，能够遵守职业道德，能从法律、经济、环境、安全等多方面理解与管理研发和技术项目；
- (4) 具有良好的人文科学素养、较强的团队精神和集体荣誉感，能够与同事和团队成员进行有效的沟通，在日用化学行业及相关领域具有职业竞争力；
- (5) 具备国际化视野，能够通过终身学习适应职业发展。

2. 毕业要求

要求学生拥有坚定民族精神和家国情怀，具备良好的科学精神和职业素养，系统扎实地掌握化学基础和专业特色知识、基本理论和实验技能；掌握基本的科学研究方法和信息技术应用能力，能够获取、加工和应用本学科及交叉学科相关信息；能够综合运用化学基础和专业特色知识，对本学科及交叉学科领域的复杂问题进行分析、研究和评价，构建和表达科学的解决方案；具有国际化视野和表达、交流、协调、竞争与合作能力；具有一定的创新意识和批判性思维；具有安全意识、环保意识和可持续发展理念，承担社会责任；具备自主学习、自我发展的能力。

毕业能力要求及其指标点分解：

毕业能力要求	指标点
毕业要求1： 具有坚定正确的政治方向、良好的思想品德和健全的人格，热爱祖国，热爱人民，拥护中国共产党的领导；具有科学精神、人文修养、职业素养、社会责任感和积极向上的人生态度，了解国情社情民情，践行社会主义核心价值观。	1-1. 具有较高思想觉悟和道德水平，树立科学的世界观和正确的人生观。
	1-2. 了解我国国情，理解个人与社会的关系，具有高度社会责任感。
	1-3. 具有科学精神和人文修养，具有健康的体魄和心理素质，遵守职业道德和规范。
毕业要求2： 掌握系统的化学、自然科学基础知识和化妆品科学、表面活性剂化学等专业特色知识，掌握必备的研究方法，了解日用化学行业及相关领域现状和发展趋势。	2-1. 掌握化学、数学等自然科学基础知识。
	2-2. 掌握化妆品科学、胶体与界面化学、表面活性剂化学等相关专业知识和研究方法，并可灵活应用。
	2-3. 了解日用化学行业发展现状和趋势，紧跟日用化学领域最新研究动态。

毕业要求3： 具备较强的实验和实践能力。能够使用现代实验设备进行日用化学品的观测、测试和分析，具有在实践中发现、认识 and 解决问题的能力。	3-1. 掌握化学等自然科学基础实验理论和方法。
	3-2. 掌握化妆品、洗涤剂等相关日用化学品分析理论和方法，熟悉现代实验研究技术手段。
	3-3. 能够应用基础实验理论和方法，运用现代实验分析技术手段，设计实验方案，搭建和操作实验系统，安全、独立地开展相关实验。
	3-4. 能够基于基础知识和专业知识，对本专业及相关领域问题进行综合分析，发现、认识 and 解决问题。
毕业要求4： 具有逻辑思维能力和批判性思维精神。能够发现、辨析、质疑、评价日用化学及相关领域的现象和问题，表达个人见解。	4-1. 掌握现代化学知识体系，能够应用自然科学基本原理正确识别复杂的理论或技术问题。
	4-2. 具有逻辑思维和批判性思维精神，能够发现日用化学行业及相关领域中的现象和问题，并综合分析、质疑、评价。
毕业要求5： 具有专业综合能力和创新能力。能够对化妆品科学、表面活性剂化学等学科领域以及交叉学科领域问题进行综合分析和研究，构建和表达科学的解决方案。	5-1. 掌握化工基础知识，了解与日用化学品相关的制造、营销、管理等知识。
	5-2. 了解化妆品科学相关交叉学科领域基础知识。
	5-3. 能够基于专业知识和交叉学科基础知识对本学科领域及交叉领域问题进行综合分析，提供科学解决方案。
毕业要求6： 具有信息获取与数据分析的能力，具有应用信息技术解决日用化学研究和产品开发中实际问题的能力。	6-1. 掌握网络文献检索的基本方法和相关语言工具。
	6-2. 能够正确采集、整理实验数据，对实验结果进行关联，分析并解释实验结果，获得合理有效的结论。
	6-3. 能够运用计算机软件等工具对日用化学研究和产品开发中实际问题进行分析、预测和模拟。
毕业要求7： 具有良好的沟通表达能力。能够通过口头和书面表达方式与同行、社会公众进行有效沟通，传播日用化学专业知识。	7-1. 能够用准确规范的专业术语与同行、社会公众进行有效沟通。
	7-2. 能按正确的格式撰写化妆品、洗涤剂等日用化学品的报告、研发和技术文稿。
毕业要求8： 具有良好的团队合作能力。能够与团队成员和谐相处，协作共事，并作为成员或领导者在团队活动中发挥积极作用。	8-1. 具有健康的心理和人际交往能力，能够与他人和谐相处。
	8-2. 能够正确认识多学科团队对解决化学问题的意义和作用，能够主动与团队成员合作，完成团队分配的任务，承担团队成员以及负责人的角色。
	8-3. 具有组织管理能力，能够综合团队成员的意见，并进行合理决策。
毕业要求9： 具有国际视野和国际交流能力。了解国际动态，关注全球性问题，尊重世界不同文化的差异性和多样性。	9-1. 掌握一门外语，能够阅读外文资料不断充实最新知识，能够在跨文化背景下进行沟通和交流。
	9-2. 理解不同国家文化的差异性，了解国际学术前沿，关注全球重大问题。

毕业要求10： 具有终身学习意识和自我管理、自主学习能力，能够通过不断学习，适应社会和个人可持续发展。	10-1. 能够认识不断探索和学习的重要性，具有自主学习和终身学习的意识。
	10-2. 掌握自主学习的方法，了解拓展知识和能力的途径，具备终身学习和适应社会与个人发展的能力。
	10-3. 了解日用化学领域的新理论、新技术和国际前沿动态，能将其与未来职业规划相联系，适应个人或职业发展的要求。
毕业要求11： 具有安全意识、环保意识和可持续发展意识。	11-1. 熟悉安全和环保的相关法律法规，具有安全意识、环保意识和可持续发展意识。
	11-2. 熟悉日用化学工业的标准和监管法规，能够正确评价该领域解决方案对安全、环保和社会可持续发展的影响。

三、主干学科与相近专业

主干学科：化学

相近专业：化学、化学工程与工艺

四、专业核心课程

有机合成、结构化学、现代分析技术、化妆品学、胶体与界面化学导论、表面活性剂物理化学、天然成分化学、香精香料化学、化妆品智能制造、生物技术基础、化妆品与表面活性剂分析

五、实践教学环节

1、分散性实践（实验、上机、实践）：总学分 23.0；总学时：740。

2、集中性实践环节

序号	课程名称	周数	学分	培养模式
(1)	军事技能	3周	2.0	学校
(2)	基础化学综合实验	1周	0.5	学校
(3)	有机合成综合实验	1周	0.5	学校
(4)	表面活性剂、胶体与界面化学综合实验	1周	0.5	学校
(5)	化妆品创新开发实践	1周	0.5	学校
(6)	应用化学专业综合实验	4周	2.0	学校
(7)	科学训练	2周	1.0	学校
(8)	毕业设计（论文）环节	16周	8.0	学校

(9)	第二课堂	-	2.0	学校
(10)	创新创业训练	-	2.0	学校
(11)	企业EHS风险管理基础	1周	0.5	学校+企业（社会）
(12)	认识实习	2周	1.0	学校+企业（社会）
合计		32周	20.5	-

3、 实践学分比例：26.4 %

六、短学期安排

序号	课程名称	学分	各短学期学时分配			备注
			短学期1	短学期2	短学期3	
1	军事技能	2.0	3周			
2	基础化学综合实验	0.5		1周		
3	有机合成综合实验	0.5		1周		
4	认识实习	1.0		2周		一周假期进行
5	表面活性剂、胶体与界面化学综合实验	0.5			1周	
6	化妆品创新开发实践	0.5			1周	
7	企业EHS风险管理基础	0.5			1周	
合计		5.5	3周	4周	3周	

七、学分分布

课程类别	学分/比例	其中实验实践学分/比例	其中选修学分/比例
通识教育课程	41.0/24.9%	10.5/6.4%	6.0/3.6%
学科平台课程	52.5/31.8%	10.0/6.1%	0
专业教育课程	51.5/31.2%	17.0/10.3%	9.0/5.5%
能力拓展课程	20.0/12.1%	6.0/3.6%	16.0/9.7%
总计	165/100%	43.5/26.4%	31.0/18.8%

八、辅修专业计划及要求

辅修专业课程学分为20学分，辅修专业学位32学分：

课程 编码	课程名称	学分/学时	各学期周学时分配					备注
			三	四	五	六	七	
								辅修专业 课程 (20学分)
								学位课程 (12学分)
	学位论文（设计）	8						

Applied Chemistry Major 2021 Undergraduate Curriculum

I 、 Basic Information

Discipline:	Science	Major Code :	070302
Degrees Conferred:	Bachelor of Science	Duration:	4 years
Requirements for Graduation Credits:	165 credit		

II 、 Educational Objectives and Requirements

1. Educational Objectives

The major cultivate high-level compound applied chemistry specialty talents for the daily chemical industry represented by cosmetics. The graduates have a strong national spirit and national feelings, have a good scientific spirit, humanistic accomplishment, professional accomplishment and social responsibility. They can systematically and solidly grasp the basic knowledge, basic theory and research methods of chemistry. They also can master the professional knowledge of cosmetics science, surfactant chemistry, etc.. They have a strong sense of innovation, practical ability and international vision. They can solve the scientific and technical problems in the interdisciplinary field of this discipline and related disciplines, and can be engaged in daily chemistry and other related fields in scientific research, technology development, production and management.

Graduates should obtain knowledge and competences as follows:

- (1) Ability to use the basic knowledge of chemistry and professional knowledge such as cosmetic science and surfactant chemistry to provide scientific solutions for the daily chemical industry from a multidisciplinary perspective;
- (2) Ability to undertake the research & development and implementation of cosmetics, detergents and other daily-use chemicals, and provide technical support for the operation and management of research and development projects;
- (3) Strong organizational and leadership skills, be able to abide by professional ethics, and be able to understand and manage R & D and technical projects from various aspects such as law, economy, environment, and safety;
- (4) Good humanities literacy, strong team spirit and collective honor, communicating effectively with colleagues and team members, and having professional competitiveness in the daily chemical industry and related fields;
- (5) International perspective, adapting to career development through lifelong learning.

2. Graduation Requirements

Graduates are required to have a firm national spirit and national feelings, and have a good scientific spirit and professionalism. They should systematically and solidly master the basic knowledge, basic theory and experimental skills of chemistry and the professional knowledge of cosmetics science, surfactant chemistry, etc.; they also should master basic scientific research methods and information technology application abilities, they should be able to obtain, process and apply relevant information of this subject and interdisciplinary subjects. They should be able to comprehensively use chemical foundation and professional knowledge to analyze, research and evaluate complex problems in this subject and interdisciplinary fields in order to construct and express scientific solutions. Graduates should have an international perspective and have the abilities to express, communicate, coordinate, compete and cooperate. They should have a certain sense of innovation and critical thinking and have a sense of safety, environmental protection, sustainable development, and assume social responsibility. They should have the ability to learn and develop independently.

Graduates should obtain knowledge and competences as follows:

Graduation Requirements	Indices
Requirement 1: Having a firm and correct political direction, good ideological character and sound personality; love the motherland, love the people, support the leadership of the Communist Party of China; having a scientific spirit, humanistic accomplishment, professional accomplishment, social responsibility and a positive attitude towards life; understanding the national conditions, social conditions and people's conditions, and practicing the socialist core values.	1-1. Having a high level of ideological awareness and morality, and establishing a scientific world outlook and a correct outlook on life.
	1-2. Understanding China's national conditions and the relationship between individuals and society, having a high sense of social responsibility.
	1-3. Having the scientific spirit and the humanities accomplishment, having the health physique and the psychological quality, abides by the professional ethics and the standard.

Requirement 2: Mastering systematic basic knowledge of chemistry and natural science, and characteristic professional knowledge of cosmetics science, surfactant chemistry, etc.; mastering necessary research methods; understanding the daily chemical industry and related fields status and development trends.	2-1. Mastering the basic knowledge of natural sciences such as chemistry and mathematics.
	2-2. Mastering the professional knowledge and research methods of cosmetic science, colloid and interface chemistry, surfactant chemistry, etc., and applying them flexibly.
	2-3. Understanding the development status and trends of the daily chemical industry, and keeping up with the latest research trends in the daily chemical field.
Requirement 3: Possessing strong experimental and practical ability. Being able to use modern experimental equipment for daily chemical observation, testing and analysis; having the ability to find, understand and solve problems in practice.	3-1. Mastering the basic experimental theories and methods of natural sciences such as chemistry.
	3-2. Mastering the analysis theories and methods of cosmetics, detergents and other related daily chemicals, familiarizing with modern experimental research techniques.
	3-3. Being able to apply basic experimental theories and methods and use modern experimental analysis techniques to design experimental programs, build and operate experimental systems, and conduct relevant experiments safely and independently.
	3-4. Comprehensively analyzing, finding, understanding and solving the problems of this subject and related fields based on basic knowledge and professional knowledge.
Requirement 4: Having logical thinking ability and critical thinking spirit. Being able to discover, identify, question, evaluate phenomena and problems in daily chemistry and related fields, and express personal opinions.	4-1. Mastering the modern chemistry knowledge system, identifying complex theoretical or technical issues correctly using the basic principles of natural science.
	4-2. Having logical thinking and critical thinking spirit, being able to discover phenomena and problems in the daily chemical industry and related fields, and comprehensively analyze, question and evaluate.
Requirement 5: Having professional comprehensive ability and innovative ability. Able to conduct comprehensive analysis and research on problems in the fields of cosmetic science, surfactant chemistry and other interdisciplinary fields, and construct and express scientific solutions.	5-1. Mastering the basic knowledge of chemical engineering and understand the manufacturing, marketing and management related to daily chemicals.
	5-2. Understanding the basic knowledge of interdisciplinary fields related to cosmetic science.
	5-3. Comprehensively analyzing the problems in this discipline and interdisciplinary fields and providing scientific solutions based on professional and interdisciplinary basic knowledges.
Requirement 6: The ability of information acquisition and data analysis, and the ability to apply information technology to solve practical problems in daily chemical research and product development.	6-1. Mastering the basic methods and related language tools of internet literature retrieval.
	6-2. Being able to correctly collect and organize experimental data, correlate the experimental results, analyze and interpret the experimental results, and obtain reasonable and effective conclusions.
	6-3. Being able to use computer software and other tools to analyze, predict, and simulate practical problems in daily chemical research and product development.
Requirement 7: Good communication skills. Ability to communicate effectively with peers and the public through oral and written expressions, and disseminate daily chemistry expertise.	7-1. Ability to communicate effectively with peers and the public in accurate and standardized professional terms.
	7-2. Ability to write reports, R & D and technical manuscripts of daily chemicals such as cosmetics and detergents in the correct format.

Requirement 8: Good teamwork skills. Ability to live in harmony with team members, collaborate and work together, and play an active role in team activities as a member or leader.	8-1. Having a healthy psychological and interpersonal skills, and living in harmony with others.
	8-2. Being able to correctly understand the significance and role of multidisciplinary teams in solving chemical problems, can actively cooperate with team members, complete the tasks assigned by the team, and assume the role of team members and leader.
	8-3. Having organizational management skills, ability to integrate the opinions of team members and make reasonable decisions.
Requirement 9: Having international vision and international communication ability. Understand international developments, pay attention to global issues, and respect the differences and diversity of different cultures in the world.	9-1. Mastering a foreign language, being able to read foreign materials and constantly enrich the latest knowledge, and being able to communicate in a cross-cultural context.
	9-2. Understanding the cultural differences of different countries, understanding the international academic frontier, and paying attention to major global issues.
Requirement 10: Having lifelong learning consciousness, self-management and independent learning ability, adapt to the sustainable development of society and individuals through continuous learning.	10-1. Being able to recognize the importance of continuous exploration and learning, having the awareness of autonomous learning and lifelong learning.
	10-2. Mastering the methods of independent learning, understanding the way to expand knowledge and ability, having the ability of lifelong learning and adapting to social and personal development.
	10-3. Understanding new theories, new technologies and international frontier developments in the field of daily chemistry, and being able to connect it with future career planning and adapt to the requirements of personal or professional development.
Requirement 11: Having safety, environmental protection and sustainable development awareness.	11-1. Familiarizing with the relevant laws and regulations of safety and environmental protection, having safety, environmental protection and sustainable development awareness.
	11-2. Understanding the standards and regulatory regulations of the daily chemical industry, being able to correctly evaluate the impact of solutions in this field on safety, environmental protection and social sustainability.

III、Main Disciplines and Related Majors

Main Disciplines: Chemistry

Related Majors: Chemistry, Chemical Engineering and Technology

IV、Core Courses

Organic Synthesis, Structural Chemistry, Modern Analytical Technique, Cosmetics Science, Introduction to Colloids and Interface Chemistry, Physical Chemistry of Surfactants, Natural Ingredient Chemistry, Flavor and Fragrance Chemistry, Cosmetic Intelligent Manufacturing, Basic Biotechnology, Analysis of Cosmetics and Surfactants

V、Practical Teaching Session

- 1、Separate Practice (Experiment, Programming and Practice) :
Total Credits: 23.0; Total Hours: 740.
- 2、Intensive Practice

No.	Course Name	Weeks	Credit	Training Mode
(1)	Military Skill Training	3	2.0	Schools

(2)	Comprehensive Experiment of Fundamental Chemistry	1	0.5	Schools
(3)	Comprehensive Experiment of Organic Synthesis	1	0.5	Schools
(4)	Comprehensive Experiment of Surfactants & Colloids and Interface Chemistry	1	0.5	Schools
(5)	Practice of Cosmetics Innovation and Development	1	0.5	Schools
(6)	Specialty Comprehensive Experiment for Applied Chemistry	4	2.0	Schools
(7)	Scientific Research Methods Training	2	1.0	Schools
(8)	Graduation Design (Thesis)	16	8.0	Schools
(9)	Co-curricular Activities	-	2.0	Schools
(10)	Innovation and Entrepreneurship Training	-	2.0	Schools
(11)	Basis of Enterprise EHS Risk Management	1	0.5	Schools and Enterprises (Society)
(12)	Cognition Practice	2	1.0	Schools and Enterprises (Society)
Total		32	20.5	-

- 3、Practice Credits Proportion: 26.4 %
Calculation Method : (Separate practice credits + Intensive practice credits)/ Total credits of this major

VI、Short Semester Arrangement

No.	Course Name	Credit	Short Semester Hour Distribution			Notes
			Short Semester1	Short Semester2	Short Semester3	
1	Military Skill Training	2.0	3 weeks			
2	Comprehensive Experiment of Fundamental Chemistry	0.5		1 weeks		
3	Comprehensive Experiment of Organic Synthesis	0.5		1 weeks		
4	Cognition Practice	1.0		2 weeks		one week in holiday
5	Comprehensive Experiment of Surfactants & Colloids and Interface Chemistry	0.5			1 weeks	
6	Practice of Cosmetics Innovation and Development	0.5			1 weeks	
7	Basis of Enterprise EHS Risk Management	0.5			1 weeks	
Total		5.5	3 weeks	4 weeks	3 weeks	

VII、Credit Distribution

Course Type	Credits/Proportion	Experiment and Practice Credits/Proportion	Optional Credits/Proportion
General Education	41.0/24.9%	10.5/6.4%	6.0/3.6%
Discipline Education	52.5/31.8%	10.0/6.1%	0
Specialized Education	51.5/31.2%	17.0/10.3%	9.0/5.5%
Competency Development	20.0/12.1%	6.0/3.6%	16.0/9.7%
Sum	165/100%	43.5/26.4%	31.0/18.8%

VIII、Minor Programs and Requirements

Minor Courses: （There are 20 credits for minor courses and 32 credits for minor degrees）

Course Code	Course Name	Credits/Hours	Weekly Hour Per Semester					Notes
			3	4	5	6	7	
								Minor Courses (20)
								Minor Degree Courses (12)
	Thesis	8						

IX、主要课程与毕业能力要求关系矩阵图(相关性强H, 相关性中M, 相关性弱L)

IX、 Correlation Matrix between Key Courses and Graduation Requirements (High Correlation—H, Medium Correlation—M, Low Correlation—L)

能力 (Requirements) 课程(Courses)	毕业能力1 Requirement 1			毕业能力2 Requirement 2			毕业能力3 Requirement 3				毕业能力4 Requirement 4		毕业能力5 Requirement 5			毕业能力6 Requirement 6			毕业能力7 Requirement 7		毕业能力8 Requirement 8			毕业能力9 Requirement 9		毕业能力10 Requirement 10			毕业能力11 Requirement 11		
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	3-4	4-1	4-2	5-1	5-2	5-3	6-1	6-2	6-3	7-1	7-2	8-1	8-2	8-3	9-1	9-2	10-1	10-2	10-3	11-1	11-2	
思想道德与法治 Cultivation of Ideological Morality and Basis of Law	H																										L			H	
中国近现代史纲要 Outline of Chinese Contemporary and Modern History		M																													
马克思主义基本原理 Elementary Theory of Marxism	H											H															M				
毛泽东思想和中国特色社会主义理论体系概论 Mao Zedong Thought and Theory of Socialism with Chinese Characteristics	H	M																													
思想政治理论综合实践 Comprehensive Practice of Ideological and Political Theory		M																													
形势与政策 Current Situation and Policies		H																												L	
大学英语 College English																M			H					H							

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能力 (Requirements) 课程 (Courses)	毕业能力1 Requirement 1			毕业能力2 Requirement 2			毕业能力3 Requirement 3				毕业能力4 Requirement 4		毕业能力5 Requirement 5			毕业能力6 Requirement 6			毕业能力7 Requirement 7		毕业能力8 Requirement 8			毕业能力9 Requirement 9		毕业能力10 Requirement 10			毕业能力11 Requirement 11	
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	3-4	4-1	4-2	5-1	5-2	5-3	6-1	6-2	6-3	7-1	7-2	8-1	8-2	8-3	9-1	9-2	10-1	10-2	10-3	11-1	11-2
大学物理实验 Physical Experiments of University							M																							
无机化学II Inorganic Chemistry				H							L																L			
无机化学实验II Inorganic Chemistry Experiment							H										M					L								
分析化学II Analysis Chemistry				H							L																L			
分析化学实验II Analytical Chemistry Experiment							H										M					L								
有机化学III Organic Chemistry III				H							L																L			
有机化学实验 Organic Chemistry Experiment							H										M					L								
物理化学 Physical Chemistry				H							L																L			
物理化学实验II Physical Chemistry Experiment							H										M					L								

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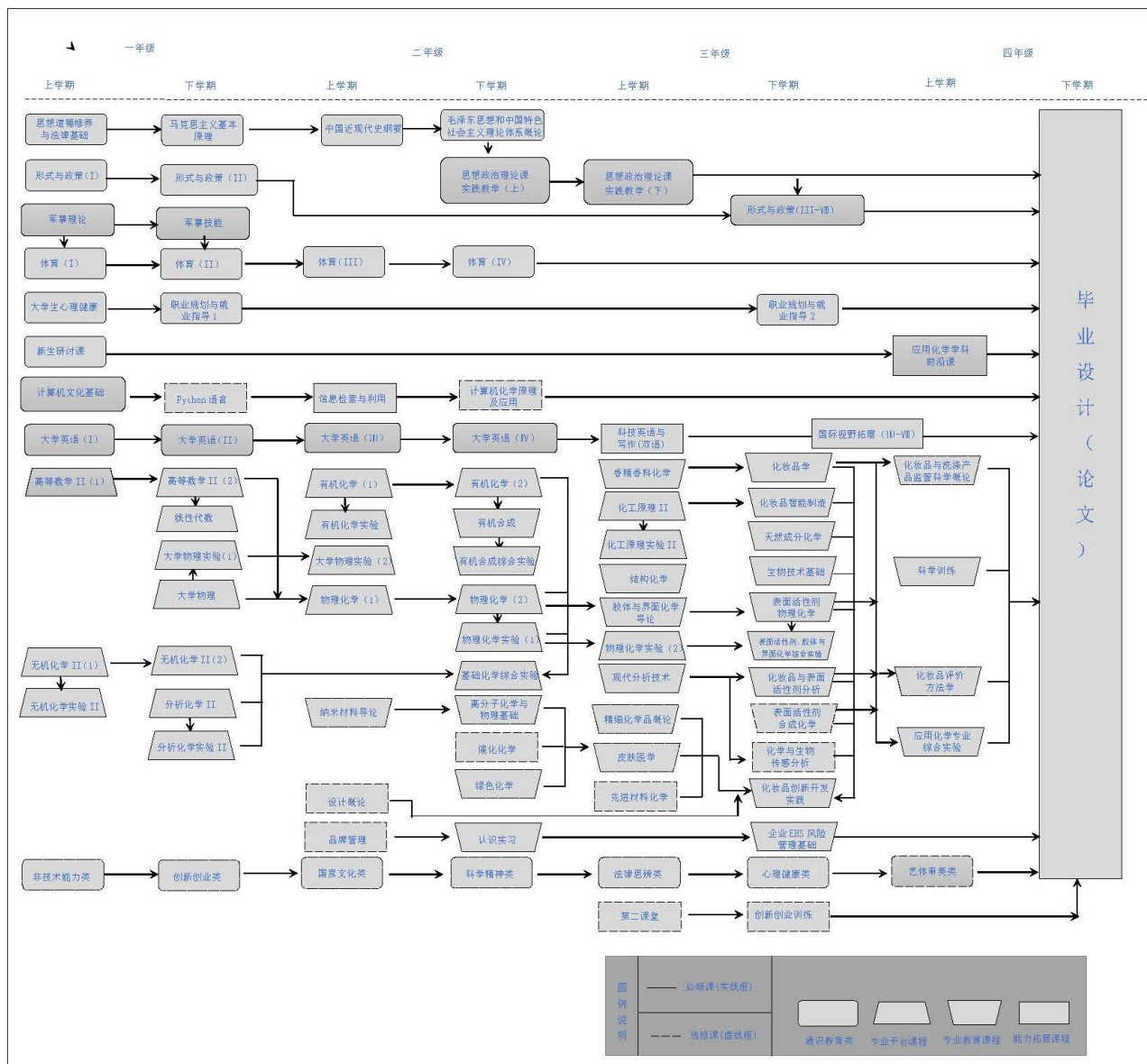
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能力 (Requirements) 课程 (Courses)	毕业能力1 Requirement 1			毕业能力2 Requirement 2			毕业能力3 Requirement 3				毕业能力4 Requirement 4		毕业能力5 Requirement 5			毕业能力6 Requirement 6			毕业能力7 Requirement 7		毕业能力8 Requirement 8			毕业能力9 Requirement 9		毕业能力10 Requirement 10			毕业能力11 Requirement 11	
	1-1	1-2	1-3	2-1	2-2	2-3	3-1	3-2	3-3	3-4	4-1	4-2	5-1	5-2	5-3	6-1	6-2	6-3	7-1	7-2	8-1	8-2	8-3	9-1	9-2	10-1	10-2	10-3	11-1	11-2
国际视野拓展 International vision expansion																								H						
计算机化学原理及应用 Principles and Applications of Computer Chemistry																		H									M			
催化化学 Catalysis Chemistry														M																
科技英语与写作 Scientific English Writing																			H					M						
先进材料化学 Advanced Material Chemistry														M																
化学与生物传感分析 Chemical and Biological Sensing														M																
毕业设计（论文）环节 Graduation Design (Thesis)										H		M			H					H							M			

X 课程体系配置图 Curriculum System Configuration Diagram



应用化学专业教学进程表

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课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes
						讲 课 Lecture	实 验 Experiment	上 机 Program- ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th			
学科平台课程 Discipline Education	学科基础课程 Basic Courses	17	大学物理实验 Physical Experiments of University	1.5	48		48				3	3							13	单双周(Odd week or even week)
		18	无机化学II Inorganic Chemistry II	6.0	96	96				4	4							12	05	1学期1-16周 2学期1-8 周(1-16 weeks in the 1st semester, 1-8 weeks in the 2nd semester)
		19	无机化学实验II Inorganic Chemistry Experiment II	1.5	48		48			4									05	
		20	分析化学II Analysis Chemistry II	3.0	48	48					4							2	05	
		21	分析化学实验II Analytical Chemistry Experiment II	2.0	64		64				4								05	
		22	有机化学III Organic Chemistry III	6.5	104	104						4	4					34	05	3学期1-16周 4学期1-10 周(1-16 weeks in the 3rd semester, 1-10 weeks in the 4th semester)
		23	有机化学实验 Organic Chemistry Experiment	2.0	64		64					7							05	
		24	物理化学 Physical Chemistry	7.0	112	112						4	4					34	05	
		25	物理化学实验II Physical Chemistry Experiment	1.5	48		48						4	4					05	5-16周单双周(Odd week or even week in 5-16 weeks)

课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes
						讲 课 Lecture	实 验 Experiment	上 机 Program- ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th			
学科平台课程 Discipline Education	学科基础课程 Basic Courses	26	化工原理II Principles of Chemical Engineering II	4.0	64	64								4				5	05	
		27	化工原理实验II Experiment of Principles of Chemical Engineering II	1.0	32		32							4					05	单双周(Odd week or even week)
		小计 Subtotal		52.0	984	680	304	0	0	14	30	18	12	12	0	0	0			
	集中性实践环节 Intensive Practice Sessions	28	基础化学综合实验 Comprehensive Experiment of Fundamental Chemistry	0.5	1周								1周						05	短学期2(Short semester 2)
		小计 Subtotal		0.5	1周															
	合计 Total				52.5	984	680	304	0	0	14	30	18	12	12	0	0	0		
专业教育课程 Specialized Education	专业核心课程 Core Courses	29	有机合成 Organic Synthesis	3.0	48	48							4					4	05	
		30	结构化学 Structural Chemistry	3.0	48	48								4				5	05	
		31	现代分析技术 Modern Analytical Technique	3.0	64	32	32							4				5	05	
		32	胶体与界面化学导论 Introduction to Colloids and Interface Chemsitry	3.0	48	48								4				5	05	
		33	香精香料化学 Flavor and Fragrance Chemistry	3.0	56	40	16							4				5	05	
		34	表面活性剂物理化学 Physical Chemistry of Surfactants	2.0	32	32									4			6	05	

课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 数 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes
						讲 课 Lecture	实 验 Experiment	上 机 Program- ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th			
专业教育课程 Specialized Education	专业核心课程 Core Courses	35	化妆品学 Cosmetics Science	3.0	56	40	16								4			6	05	
		36	天然成分化学 Natural Ingredient Chemistry	3.0	48	48									4			6	05	
		37	生物技术基础 Basic Biotechnology	1.5	24	24									4			6	05	
		38	化妆品与表面活性剂分析 Analysis of Cosmetics and Surfactants	3.0	64	32	32								4			6	05	
		39	化妆品智能制造 Cosmetic Intelligent Manufacturing	2.5	40	40									4			6	05	
		小计 Subtotal		30.0	528	432	96	0	0	0	0	0	4	16	24	0	0			
	专业选修课程 Optional Courses	40	纳米材料导论 Introduction to Nanomaterials	1.5	24	24						4							05	
		41	高分子化学与物理基础 Basics of Polymer Chemistry and Physics	1.5	24	24							4						05	
		42	绿色化学 Green Chemistry	1.5	24	24							4						05	
		43	精细化学品概论 Introduction to Fine Chemicals	1.5	24	24								4					05	
		44	皮肤医学 Dermatology	1.5	24	24								4					28	
		45	表面活性剂合成化学 Synthesis Chemistry of Surfactants	2.0	32	32									4				05	

课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes
						讲 课 Lecture	实 验 Experiment	上 机 Program- ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th			
专业教育课程 Specialized Education	专业选修课程 Optional Courses	46	化妆品与洗涤产品监管科学概论 Introduction to Cosmetics and Detergents Supervision Science	1.5	24	24										4			05	
		47	化妆品评价方法学 Cosmetics Evaluation Methodology	1.5	24	24										4			05	
		小计 Subtotal		12.5	200	200	0	0	0	0	0	4	8	8	4	8	0			
		修满7.5学分 Completing 7.5 credits																		
	集中性实践环节 Intensive Practice Sessions	48	有机合成综合实验 Comprehensive Experiment of Organic Synthesis	0.5	1周								1周						05	短学期2(Short semester 2)
		49	认识实习 Cognition Practice	1.0	2周								2周						05	短学期2，1周假期进行 (Short semester 2, 1 week in holiday)
		50	表面活性剂、胶体与界面 化学综合实验 Comprehensive Experiment of Surfactants & Colloids and Interface Chemistry	0.5	1周										1周				05	短学期3(Short semester 3)
		51	化妆品创新开发实践 Practice of Cosmetics Innovation and Development	0.5	1周										1周				05	短学期3(Short semester 3)
		52	企业EHS风险管理基础 Basis of Enterprise EHS Risk Management	0.5	1周										1周				05	短学期3(Short semester 3)
		53	应用化学专业综合实验 Specialty Comprehensive Experiment for Applied Chemistry	2.0	4周											4周			05	11-14周(11-14 weeks)

课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 数 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes
						讲 课 Lecture	实 验 Experiment	上 机 Program- ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th			
专业教育课 程 Specialized Education	集中性实践环节 Intensive Practice Sessions	54	科学训练 Scientific Research Methods Training	1.0	2周											2周		05	15-16周(15-16 weeks)	
		55	毕业设计（论文）环节 Graduation Design （Thesis）	8.0	16周											16 周		05		
		小计 Subtotal		14.0	28周															
	合计 Total			51.5	728	632	96	0	0	0	0	4	12	24	28	8	0			
能力拓展课 程 Competency Development	专业自主课程 Individualized Courses	56	应用化学学科前沿课 Frontier Courses of Applied Chemistry	1.0	16	16										2			必选	
		57	Python语言程序设计 Programming using Python	3.0	64	32		32			4								32	
		58	信息检索与利用 Information Retrieval and Utilization	2.0	32	32						4							05	必选
		59	国际视野拓展 International vision expansion	1.0	16	16						2	2	4	4	2	2		05	必选，采用备案制 (Compulsory, using the filling system)
		60	品牌管理 Brand management	1.0	16	16						4							08	MOOC
		61	设计概论 Introduction to design	1.0	16	16						4							06	
		62	计算机化学原理及应用 Principles and Applications of Computer Chemistry	2.5	56	24		32						4					05	

课程类别 Course Type	课程性质 Course Nature	序号No.	课程名称 Course Name	学 分 Credits	总学时 数 Total Credit Hours	学时分配 Credit Hour Distribution				各学期周学时分配 Weekly Hours Per Semester								课程考试 学期 Examination Semester	开课学 院 School	备 注 Notes
						讲 课 Lecture	实 验 Experiment	上 机 Program- ming	实 践 Practice	一 1st	二 2nd	三 3rd	四 4th	五 5th	六 6th	七 7th	八 8th			
能力拓展课程 Competency Development	专业自主课程 Individualized Courses	63	催化化学 Catalysis Chemistry	2.0	32	32							4					05		
		64	科技英语与写作 Scientific English Writing	2.0	32	32								4				05	必选	
		65	先进材料化学 Advanced Material Chemistry	2.0	32	32								4				05		
		66	化学与生物传感分析 Chemical and Biological Sensing	2.0	32	32									4			05		
		小计 Subtotal			19.5	344	280	0	64	0	0	4	14	10	12	8	4	2		
		修满16.0学分 Completing 16 credits																		
	创新实践环节 Innovation Practice	第二课堂 Co-curricular Activities			2.0	按《江南大学本科生第二课堂成绩单实施办法》执行													30	
		创新创业训练 Innovation and Entrepreneurship Training			2.0	按《江南大学本科生创新创业训练学分认定办法》执行													22	
	合计 Total				20.0															
总计 Sum				165.0	2844	2104	400	96	244	31	51	48	43	51	39	13	3			