

## 化学工程与工艺专业留学本科生培养方案（2019 版）

### Program in Chemical Engineering and Process(2019)

#### Training goals:

Cultivating senior engineer and technician to meet the needs of social and economic development, to have a sense of social responsibility, good professional ethics and humanities and social sciences, to grasp a solid natural science foundation and generous chemical engineering knowledge, to possess practical ability, innovative consciousness, independent learning, to hold an international perspective, teamwork and good communication skills, who can engage in design, R&D, testing, production operation and management, scientific research and other work in chemical, petrochemical, materials, light industry, medicine and environmental protection departments. After graduation, you can be competent to solve complex engineering technical problems in the fields of chemical engineering and biochemical engineering, and become the engineering technology or management backbone of your unit.

#### Graduation requirements:

Through systematic course learning, basic experimental skills training and engineering practice training and engineering practice training, students should meet the following requirements after they graduate:

**(1) Engineering knowledge:** Able to use mathematics, natural sciences, engineering foundations and professional knowledge to solve complex chemical engineering problems.

**(2) Problem analysis:** Able to apply the basic principles of mathematics, natural sciences and engineering sciences, identify, express, and analyze complex chemical engineering problems through literature research, which can be effectively solved.

**(3) Design/development solutions:** Able to design solutions to complex chemical engineering problems, involving systems, units (components) or technological processes that meet specific needs, and be able to achieve innovative awareness in design, considering society and health, Safety, legal, cultural and environmental factors.

**(4) Research:** Able to study complex chemical engineering problems based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective choices through information synthesis.

**(5) Use modern tools:** Able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex chemical engineering problems, including the prediction and simulation of complex chemical engineering problems, and be able to understand their limitations Sex.

**(6) Engineering and society:** Able to conduct reasonable analysis based on the background knowledge of chemical engineering, evaluate the impact of chemical

engineering and process professional engineering practices and complex engineering problem solutions on society, health, safety, law and culture, and understand the responsibility .

**(7) Environment and sustainable development:** Able to understand and evaluate the impact of engineering practice for complex chemical engineering problems on the environment and sustainable development of society.

**(8) Professional norms:** Having humanities and social science literacy, a sense of social responsibility, and be able to understand and abide by engineering professional ethics and norms and responsibilities in chemical engineering practice.

**(9) Individuals and teams:** Able to assume the roles of individuals, team members and leaders in a team with a multidisciplinary background.

**(10) Communication:** Able to effectively communicate and communicate with counterparts in developed countries and the public on complex chemical engineering issues, including writing reports and design descriptions, expressing statements, expressing clearly or responding to instructions.

**(11) Project management:** Understanding and mastering the principles of chemical engineering management and economic decision-making methods, and be able to apply them in a multidisciplinary environment.

**(12) Lifelong learning:** Having the consciousness of independent learning and lifelong learning, and have the ability to continuously learn and adapt to development.

**Main disciplines:** chemistry, chemical engineering and technology

**Core courses:** inorganic chemistry, organic chemistry, physical chemistry, process engineering principles, chemical reaction engineering, chemical system engineering, chemical technology, chemical instrumentation and automation, engineering design and software application, chemical equipment mechanical foundation, safety engineering management, chemical thermodynamics , Modern Separation Technology and Application, Safe Chemistry (Chinese)

**The Duration of study:** Study life of 4 years

The Curriculum Schedule for Chemical Engineering and Process(2019)

课程性质 (Course Category)	开课学院 (School by which courses opened)	课程名称 (Chinese Course Name)	课程名称 (English Course Name)	总学分 (Total Credits)	总学时 (Total class hours)	各环节学时分配 (Allocation of Credit Hour)					建议修读学期 (Term)	备注 (Remarks)
						课堂教学 (Teaching)	实验 (Experiment)	上机 (Computer Practice)	实践 (Practice)	课外 (Extracurricular)		
通识教育必修 (General Education Compulsory course)	海外教育学院 (OEC)	入学教育	Orientation Education	1	16	16					1	
	海外教育学院 (OEC)	中国概况	Overview of China	4	80	64				16	1	
	外国语学院 (SFL)	跨文化交流	Intercultural Communication	2	48	32				16	1	
	图书馆 (library)	文献检索	Information Retrieval	1	16	16					2	
	语言文化中心 (LCC)	综合汉语 (I)	Comprehensive Chinese- I	4	112	64				48	1	
	语言文化中心 (LCC)	综合汉语 (II)	Comprehensive Chinese-II	4	112	64				48	2	
	语言文化中心 (LCC)	综合汉语 (III)	Comprehensive Chinese-III	4	112	64				48	3	
	语言文化中心 (LCC)	综合汉语 (IV)	Comprehensive Chinese-IV	4	112	64				48	4	
	食品与生物工程学院/化学化工学院/药学院 (SFBE+SCCE+SOP)	健康科学实践汉语 (I)	Speciality Chinese-I	2	48	32				16	5	
	计算机科学与通信工程学院 (SCSCE)	程序设计基础 (人工智能与大数据)	Fundamental to Programming (Artificial Intelligence and Big Data Analysis)	3	64	32		32			1	
	理学院 (FOS)	高等数学D (I)	Advanced Mathematics D-I	5	80	80					1	
	理学院 (FOS)	高等数学D (II)	Advanced Mathematics D-II	3	48	48					2	
	理学院 (FOS)	线性代数	Linear Algebra	2	32	32					2	
	理学院 (FOS)	概率统计	Probability and Statistics	3	48	48					3	
	理学院 (FOS)	大学物理C (I)	College Physics C-I	3	48	48					2	
	理学院 (FOS)	大学物理C (II)	College Physics C-II	2.5	40	40					3	
	理学院 (FOS)	大学物理实验C (I)	College Physics Experiment C- I	0.5	16		16				2	
	理学院 (FOS)	大学物理实验C (II)	College Physics Experiment C-II	0.5	16		16				3	
	化学化工学院 (SCCE)	无机化学	Inorganic Chemistry	3	48	48					2	
	化学化工学院 (SCCE)	无机化学实验	Inorganic Chemistry Experiment	0.5	16		16				2	
	化学化工学院 (SCCE)	分析化学	Analytical Chemistry	3	48	48					3	

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						课堂教学 (Teaching)	实验 (Experiment)	上机 (Computer Practice)	实践 (Practice)	课外 (Extracurricular)		
	化学化工学院 (SCCE)	分析化学实验	Analytical Chemistry	0.5	16		16				3	
	小计			55.5	1176	840	64	32	0	240		
通识教育选修 (General Education Elective courses)	网上课程	领导力与创新	Leadership and Innovation	1	24	24					2-7	经济管理类 选修1学分 (at least 1 credit)
	管理学院(MNG)	技术创新管理理论与案例	Theory and Case of Technology Innovation Management	1	24	24					2-7	
	财经学院(SFE)	经济学导论	Introduction to Economics	1	24	24					2-7	
	法学院/知识产权中心(SOL)	知识产权理论与实务	Intellectual Property Theory and Practice	1	24	24					2-7	
	文学院/语言文化中心(LCC)	中国经典的翻译与传播	Translation and Dissemination of Chinese Classics	1	24	24					2-7	人文艺术类 选修1学分 (at least 1 credit)
	文学院/语言文化中心(LCC)	大运河文化	The Grand Canal Culture	1	24	24					2-7	
	艺术学院(SOA)	中西方园林赏析	Appreciation of Chinese and Western Gardens	1	24	24					2-7	
	外国语学院(SFL)	中国茶修	The Art of Drinking Chinese Tea	1	24	24					2-7	
	外国语学院(SFL)	中国太极	The Chinese Tai Chi	1	24	24					2-7	
	法学院(SOL)	中国商务法律环境	The Legal Environment of China's Business	1	24	24					2-7	
	艺术学院/外语学院/文学院(SOA+SFL)	中国音乐赏析	Chinese Music Appreciation	1	24	24					2-7	
	艺术学院/外语学院/文学院(SOA+SFL)	中国影视赏析	Chinese Movie and TV Programs Appreciation	1	24	24					2-7	
	外国语学院(SFL)	批判性思维	Critical Thinking	1	24	24					2-7	综合教育类 选修1学分 (at least 1 credit)
	教师教育学院(STE)	国际与比较教育的趋势和问题	Trends and Issues in International and Comparative Education	1	24	24					2-7	
	医学院 (SOM)	饮食与健康	Diet and Health	1	24	24					2-7	

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						课堂教学 (Teaching)	实验 (Experiment)	上机 (Computer Practice)	实践 (Practice)	课外 (Extracurricular)		
	外国语学院(SFL)	大众传播与新媒体	Mass Communication and New Media	1	24	24					2-7	credit)
	一带一路国际人才学院 (	一带一路数字化工业节能创新实践	The "Belt and Road" Digital Innovation Workshop on Industrial Energy Saving	1	24	24					2-7	创新创业教育类选修1学分 (at least 1 credit)
	一带一路国际人才学院	工业无损检测创新创业训练	Industrial Non-destructive Innovation and Entrepreneurship Training	1	24	24					2-7	
	小计			4	432	432						
合计				59.5	1608	1272	64	32	0	240		
	食品与生物工程学院/化学化工学院/药学院 (SCCE+SFBE+SOP)	健康科学导论	Introduction to Health Sciences	2	32	32					2	
大类基础必修 (Basic Compulsory courses)	化学化工学院 (SCCE)	有机化学	Organic Chemistry	4	64	60				4	3	
	化学化工学院 (SCCE)	有机化学 实验	Organic Chemistry	1	32		30			2	3	
	化学化工学院 (SCCE)	物理化学	Physical Chemistry	3	48	48					3	
	化学化工学院 (SCCE)	物理化学实验	Physical Chemistry	0.5	16		16				3	
	化学化工学院 (SCCE)	现代分析技术	Advanced Analysis Technology	4	64	60				4	4	
	化学化工学院 (SCCE)	现代分析技术实验	Advanced Analysis Technology Experiment	1	32	0	30			2	4	
	食品与生物工程学院/药学院 (SFBE+SOP)	生物化学与分子生物学	Biochemistry and Molecualr Biology	4	64	64					5	
	食品与生物工程学院/药学院 (SFBE+SOP)	生物化学与分子生物学实验	Biochemistry Molecualr Biology Experiment	1.5	48		48				5	
	食品与生物工程学院 (SFBE)	微生物学	Microbiology	4	80	48	32				4	
	化学化工学院 (SCCE)	工程设计与软件应用	Engineering Design and Software Application	3	48						6	
	食品与生物工程学院 (SFBE)	营养学	Nutriology	2	32						6	

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						课堂教学 (Teaching)	实验 (Experiment)	上机 (Computer Practice)	实践 (Practice )	课外 (Extracurricular)		
	小计			30	560	312	156					
大类基础选修 (Basic Elective Courses)	化学化工学院 (SCCE)	高分子化学与工程	Polymer Chemistry and Engineering	3	48	48					6	
	化学化工学院 (SCCE)	材料化学与工程	Materials Chemistry and Engineering	2	32	32					7	
	化学化工学院 (SCCE)	可持续化学与工程	Sustainable chemistry and engineering	1.5	32	16				16	6	
	食品与生物工程学院 (SFBE)	食品工程原理	Principle of Food Engineering	3.5	64	48	16				5	
	小计			10								
合计				40								
专业课程必修 (Specialty Compulsory Courses)	化学化工学院 (SCCE)	过程工程原理	Process Engineering Principles	5	80	80	0				5	
	化学化工学院 (SCCE)	化工仪表与自动化	Chemical Meters and Automation	2	32	32					6	
	化学化工学院 (SCCE)	过程工程原理实验	Lab Work for Process Engineering Principles	1.5	45	0	45				5	
	化学化工学院 (SCCE)	传递过程原理	Principle of Transport Processes	2	32	32	0				5	
	化学化工学院 (SCCE)	化工专业实验	Special Experiment for Chemical Engineering	1.5	45	0	45				7	
	化学化工学院 (SCCE)	化工工艺学	Chemical Technology	2	32	32	0				6	
	化学化工学院 (SCCE)	化工设备机械基础	Basic Chemical Equipment Mechanical	2	32	32	0				5	
	化学化工学院 (SCCE)	化学反应工程	Chemical Reaction Engineering	2	32	32	0				6	
	化学化工学院 (SCCE)	化工热力学	Chemical Engineering Thermodynamics	2	32	32	0				6	
	小计			20	362	272	90					
	化学化工学院 (SCCE)	精细化工工艺学	Fine Chemical Technology	2	32	32	0				5	

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						课堂教学 (Teaching)	实验 (Experiment)	上机 (Computer Practice)	实践 (Practice)	课外 (Extracurricular)		
专业课程选修 (Specialty Elective Courses)	化学化工学院 (SCCE)	精细化工专业实验	Experimental Fine Chemical Technology	1.5	45	0	45				5	
	化学化工学院 (SCCE)	工业催化	Industrial Catalysis	2	32	32	0				7	
	化学化工学院 (SCCE)	化工腐蚀与防护	Chemical Corrosion and Protection	2	32	32	0				7	
	化学化工学院 (SCCE)	高分子化学	Polymer Chemistry	2	32	32	0				7	
	化学化工学院 (SCCE)	石油加工工艺学	Petrochemical Engineering Technology	2	32	32	0				6	
	小计			9								
自主研学创新 (Self-study course)	化学化工学院 (SCCE)	现代分离技术与运用	Advanced Separation Technologies and applications	2	32	24				8	6	化学工程与工艺专业进阶课程 (选修9个学分At least 9 credits)
	化学化工学院 (SCCE)	反应器设计原理	Principles and Applications of Reactor Design	3	48	32	0			16	7	
	化学化工学院 (SCCE)	精细有机合成技术	Fine Organic Synthesis	2	32	16	0			16	7	
	食品与生物工程学院 (SFBE)	试验设计方法	Experimental design	2	32	24	8				4	
	食品与生物工程学院 (SFBE)	计算机在食品工程中的应用	Digital image processing for Food quality	1	16	8		8			5	
	小计			10								化学工程与工艺专业跨学科专业课程 (选修4个) Interdisciplinary Courses at least 4 credits
	食品与生物工程学院 (SFBE)	食品无损检测技术	Food nondestructive testing technology	2	32	28	4				7	
	化学化工学院 (SCCE)	安全工程管理	Safety engineering chemistry	2	32	30				2	6	
	机械学院 (SME)	化工制图	Chemical Engineering Cartography	3	48	32	16				5	
	小计			7								
	食品与生物工程学院/化学化工学院/药学院 (SFBE+SCCE+SOP)	健康科学实践汉语 (II)	Speciality Chinese-II	2	48	32				16	5	

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						课堂教学 (Teaching)	实验 (Experiment)	上机 (Computer Practice)	实践 (Practice)	课外 (Extracurricular)		
	康奈尔大学在线课程	数据分析	Data Analytics	1							5-6	
	化学化工学院 (SCCE)	安全化学汉语	Safety Chemistry Chinese	2	48	32				16	6	
	语言文化中心 (LCC)	汉语进阶课程	Advanced Chinese	2	32	32					5	
	合计			16								
素质拓展 (Quality developing activities)	海外教育学院 (OEC)	学术研讨等社团活动	Academic Activities	1							2-7	
	海外教育学院 (OEC)	社会实践活动	Social Activities	1							2-7	
	海外教育学院 (OEC)	专业技能培训、比赛	Professional Skills Training and Competition	1							2-7	
	海外教育学院 (OEC)	创新创业	Innovation and Entrepreneurship	3							2-7	
	合计			6								
实践环节必修 (Practical Compulsory Courses)	化学化工学院 (SCCE)	实验室安全教育	Lab Safety Education	1	1周						1	
	化学化工学院 (SCCE)	化工认识实习	Chemical Engineering Cognition Practice	2	2周						3	
	化学化工学院 (SCCE)	生产实习	Engineering Practise	3	3周						6	
	化学化工学院 (SCCE)	过程工程原理课程设计	Course Work of Process Engineering Principles	2	2周						5	
	化学化工学院 (SCCE)	化工工艺与设备设计	Chemical Engineering Technology and Design of Equipments	2	2周						7	
	工业中心 (Industrial Center)	基础工程训练	Basic Engineering Training	1	1周						2	
	化学化工学院 (SCCE)	毕业设计 (论文)	Graduation Design (Dissertation)	15.5	16周						8	
	合计			26.5	27周							