化学工程专业留学生本科培养方案（英文班）

Bachelor Program for Foreign Students Majoring in Chemical Engineering (English-taught Group)

（专业代码：081301）

(Major code:081301)

## 一、培养目标

1. **Training Objective**

面向化工行业，培养符合石油石化行业发展需求，具有良好的职业道德和社会责任感，掌握化工生产工艺过程及设备的基本规律和原理，具备从事化工生产控制与管理、化工产品和过程研究与开发、化工装置设计与放大等能力，具有创新意识和国际视野的化工工程技术人才。

The training object of chemical engineering major for students is service-oriented to chemical engineering fields. The graduated students should not only master the roles and principles of chemical engineering processes and the related equipment, but also have good professional ethics and social responsibility. Furthermore, the graduated students should own the ability to work in chemical engineering manufacture control and management, production and process research, equipment design and process scale-up. The most important objective is to develop chemical engineering talents with innovative consciousness and international vision.

## 二、专业核心课程

**2. Core Courses of Chemical Engineering Major**

化工原理、化工热力学、反应工程、化工工艺学、化工产品开发、现代分离技术、化工设计、石油炼制工程。

Principles of Chemical Engineering, Chemical Engineering Thermodynamics, Chemical Reaction Engineering, Technology of Chemical Engineering, Chemical Product Development, Modern Isolation Technology, Chemical Engineering Design, Petroleum Refining engineering

## 三、毕业要求

## 3. Graduation requirements

学生毕业时应达到以下12条要求：

The students should meet the following requirements when they graduate:

要求1.工程知识：能够将数学、自然科学、工程基础和专业知识用于解决复杂化工问题。

**Requirement 1. Engineering Knowledge**: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex chemical engineering problems.

要求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，识别、表达、并通过文献研究分析复杂化工问题，以获得有效结论。

**Requirement 2. Problem Analysis**: Identify, formulate, research literature and analyse complex chemical engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

要求3.设计/开发解决方案：能够设计针对复杂化工问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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。

**Requirement 3. Design/ development of solutions**: Design solutions for complex chemical engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

要求4.研究：能够基于科学原理并采用科学方法对复杂化工问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

**Requirement 4. Investigation:** Conduct investigations of complex chemical engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

要求5.使用现代工具：能够针对复杂化工问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂化工问题的预测与模拟，并能够理解其局限性。

**Requirement 5. Modern Tool Usage:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex chemical engineering problems, with an understanding of the limitations.

要求6.工程与社会：能够基于化工相关背景知识进行合理分析，评价专业工程实践和复杂工程问题解决方案对社会、健康、安全、法律以及文化的影响，并理解应承担的责任。

**Requirement 6. The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex chemical engineering problems.

要求7.环境和可持续发展：能够理解和评价针对复杂化工问题的专业工程实践对环境、社会可持续发展的影响。

**Requirement 7. Environment and Sustainability:** Understand and evaluate the sustainability and impact of professional engineeringwork in the solution of complex engineering problems in societal and environmental contexts.

要求8.职业规范：具有人文社会科学素养、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。

**Requirement 8. Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of chemical engineering practice.

要求9.个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

**Requirement 9. Individual and Team work:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

要求10.沟通：能够就复杂化工问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

**Requirement 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

要求11.项目管理：理解并掌握化工管理原理与经济决策方法，并能在多学科环境中应用。

**Requirement 11. Project Management and Finance:**Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.要求12.终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

**Requirement12.Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## 四、毕业去向

**4. Graduating Students’ Career Position**

常州大学化学工程专业已通过中国工程教育认证。根据华盛顿协议，取得常州大学化学工程专业毕业证书得到华盛顿协议成员国的认可，包括美国、英国、加拿大、澳大利亚、日本、新加坡等。

The chemical engineering major in Changzhou University have been certified by the China Engineering Education Accreditation Association（CEEAA）. According to the **Washington Accord**, an International Professional Engineers Agreement, the diploma of chemical engineering major in Changzhou University was admitted by the member country of the Washington accord, including USA,UK,Canada,Australia,Japan,Singapore, etc.

本专业的就业领域涉及化工及相关领域，毕业生可以从事化工、炼油、医药、能源、冶金、材料、环境、外贸等领域的科研、开发、设计、生产及管理工作。

化学工程专业学习提高了学生分析和解决问题的能力，这对于就业非常重要。本专业60%-70%的毕业生就职于大型国有企业、民营企业、政府部门以及研究机构。约有20%-30%的毕业生继续修读研究生学位，读研的学生通常就职于研究机构或者高校。

The study of engineering fosters the development of quantitative, analytical, and problem-solving skills which are very useful in many different career areas. On average, 60% to 70% of graduates with a Bachelor of Chemical Engineering degree choose employment in large state-owned enterprises,private enterprise, government laboratories and research centers. Approximately 20% to 30% of the chemical engineering graduates will choose to continue their education toward a master degree. Students who earn advanced degrees in engineering usually pursue a career in advanced research or as a faculty member in a college of engineering.

## 五、毕业学分要求

## 5. Credit requirements for graduation

本专业毕业总学分要求为 120学分。学分与学时分配比例见下表：

The total credits required for graduation of this major are 120 credits. The proportion of credits and credit hours is shown in the following table:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **类别**  **Category** | | | | | **学分数**  **Credits** | **学时数**  **Hours** | **学分比（%）**  **Credit ratio (%)** | **学时比（%）**  **Credit hour ratio (%)** |
| 必修  Compulsory | 理论教学  Theory  teaching | 基础课程  Basic courses | | | 45 | 728 | 37.7 | 46.4 |
| 专业基础课程  Professional foundation course | | | 44.5 | 750 | 37.2 | 45.8 |
| 专业课程  Professional courses | | | 10 | 160 | 8.4 | 7.8 |
| 小计  Subtotal | | | 99.5 | 1638 | 83.3 | 100 |
| 实践环节小计  Practice subtotal | | | | 20 |  | 16.7 |  |
| 合计  Total | | | | 119.5 | 1638 | 100.0 | 100.0 |
| 毕业要求  Graduation requirements |  | |  | 1、本专业学生需要修满教学计划要求的120学分，方可毕业；  2、符合条件，授予工学学士学位；  3、本专业学生使用英文撰写毕业论文。  1. Students of this major need to complete 120 credits required by the program and pass HSK3 level to graduate.  2. Qualified students will be awarded bachelor of engineering degree.  3. Students of this major write their graduation thesis in English. | | | | |

## 六、课程设置、教学环节及进程

## 6. Curriculum, teaching links and progress

### （一）基础课程

### (1) Basic courses

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 课程  代码  Course code | 课程名称  Course name | 总学时数  Total credit hours | 实践与实验学时数  Practice and laboratory hours | 学分数Credits | 各学期周学时  Weekly hours of each semester | | | | | | | |
| 1  One | 2  Two | 3  Three | 4  Four | 5  Five | 6  Six | 7  Seven | 8  Eight |
| 90611-2# | 综合汉语  Comprehensive Chinese | 256 |  | 16 | 8/128  8.0 | 8/128  8.0 |  |  |  |  |  |  |
| 90710081 | 汉语听说  Chinese Listening and Speaking | 128 |  | 8 | 4/64  4.0 | 4/64  4.0 |  |  |  |  |  |  |
| 90640041 | 中国文化  Introduction to China | 32 |  | 2 | 2 |  |  |  |  |  |  |  |
| 53271081  53272061 | 高等数学  Advanced Mathematics | 112 |  | 7 |  | 4/64  4.0 | 3/48  3.0 |  |  |  |  |  |
| 50030041 | 线性代数  Linear Algebra | 32 |  | 2 |  |  |  | 2.0 |  |  |  |  |
| 53051051  53052051 | 大学物理  College Physics | 80 |  | 5 |  | 4/40  2.5 | 4/40  2.5 |  |  |  |  |  |
| 53061025  53062025 | 大学物理实验Experiment of College Physics | 40 |  | 2 |  | 1.0 | 1.0 |  |  |  |  |  |
| 40170063 | 计算机基础与应用Fundamentals and Application of Computer | 48 |  | 3.0 |  |  | 3.0 |  |  |  |  |  |
| **A** | **应修小计**  **Subtotal** | **760** |  | **45** |  |  |  |  |  |  |  |  |

### 专业基础课

### Specialized basic courses

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 课程  代码  Course code | 课程名称  Course name | 总学时数  Total credit hours | 实践与实验学时数  Practice and laboratory hours | 学分数  Credits | 各学期周学时  Weekly hours of each semester | | | | | | | |
| 1  One | 2  Two | 3  Three | 4  Four | 5  Five | 6  Six | 7  Seven | 8  Eight |
| 10011-2# | 无机与分析化学  Inorganicand Analytical chemistry | 72 |  | 4.5 | 4/32  2.0 | 3/40  2.5 |  |  |  |  |  |  |
| 11721035  11722045 | 无机与分析化学实验  Experiment of Inorganicand Analytical chemistry |  | 70 | 3.5 | 1.5 | 2.0 |  |  |  |  |  |  |
| 10090081 | 有机化学  Organic Chemistry | 64 |  | 4.0 |  |  | 4/64  4.0 |  |  |  |  |  |
| 11821035  11822025 | 有机化学实验  Experiment ofOrganic Chemistry |  | 40 | 2.0 |  |  | 1.0 | 1.0 |  |  |  |  |
| 10211061  10212041 | 物理化学  Physical Chemistry | 80 |  | 5.0 |  |  | 3.0 | 2.0 |  |  |  |  |
| 15591025  15592025 | 物理化学实验Experiment of Physical Chemistry |  | 40 | 2.0 |  |  |  | 1.0 | 1.0 |  |  |  |
| 14011071  14012081 | 化工原理Principles of Chemical Engineering | 120 |  | 7.5 |  |  |  | 3.5 | 4.0 |  |  |  |
| 14031-2# | 化工原理实验Experiment for Principles of Chemical Engineering |  | 40 | 2.0 |  |  |  | 1.0 | 1.0 |  |  |  |
| 课程  代码  Course code | 课程名称  Course name | 总学时数  Total credit hours | 实践与实验学时数  Practice and laboratory hours | 学分数  Credits | 各学期周学时  Weekly hours of each semester | | | | | | | |
| 1  One | 2  Two | 3  Three | 4  Four | 5  Five | 6  Six | 7  Seven | 8  Eight |
| 14540061 | 化工热力学Chemical Engineering Thermodynamics | 48 |  | 3.0 |  |  |  |  | 3.0 |  |  |  |
| 14520061 | 反应工程  Reaction Engineering | 48 |  | 3.0 |  |  |  |  |  | 3.0 |  |  |
| 14220041 | 化工技术经济与管理  Economics and Management of Chemistry Technology | 32 |  | 2.0 |  |  | 2.0 |  |  |  |  |  |
| 11860041 | 化工安全与环保Chemical Engineering Safety Technology and Environmental Protection | 32 |  | 2.0 |  |  |  | 2.0 |  |  |  |  |
| 20030041 | 工程制图Engineering Drawing and CAD | 32 |  | 2.0 |  |  | 2.0 |  |  |  |  |  |
| 45150043 | 电工电子技术Electronic and Electrical Technology | 32 |  | 2.0 |  |  |  | 2.0 |  |  |  |  |
| B | **应修小计**  **Subtotal** | 560 | 190 | 44.5 |  |  |  |  |  |  |  |  |

### （三）专业课

**(3) Specialized courses**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 课程  代码  Course code | 课程名称  Course name | 总学时数  Total credit hours | 实践与实验学时数  Practice and laboratory hours | 学分数Credits | 各学期周学时  Weekly hours of each semester | | | | | | | |
| 一One | 二Two | 三Three | 四Four | 五Five | 六Six | 七Seven | 八Eight |
| 11140031 | 化工工艺学Technology of Chemical Engineering | 24 |  | 1.5 |  |  |  |  |  |  | 1.5 |  |
| 11020041 | 化工产品开发Chemical product development | 24 |  | 1.5 |  |  |  |  |  |  | 1.5 |  |
| 11070031 | 化工工程设计chemical engineering design | 24 |  | 1.5 |  |  |  |  |  | 1.5 |  |  |
| 14160031 | 现代分离技术  Modern Separation Technology | 32 |  | 2.0 |  |  |  |  |  | 2.0 |  |  |
| 11190041 | 石油炼制工程Petroleum Refining engineering | 32 |  | 2.0 |  |  |  |  |  |  | 2.0 |  |
| 11120031 | 科技论文写作Scientific Paper Writing | 24 |  | 1.5 |  |  |  |  |  |  | 1.5 |  |
| C | **应修小计**  Subtotal | 160 |  | 10 |  |  |  |  |  |  |  |  |

### （四）实践环节（S类课程）

**(4) PracticalTraining**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **课程代码**  **Course code** | **实践性环节名称**  **Name of Practical Link** | **周数**  **Weeks** | **学分数**  **Credits** | **学期**  **Semester** | **起止周数**  **Start and Stop weeks** |
| 32150027 | 金工实习  Metal Craft Practice | 1 | 1.0 | 3 | 17 |
| 14150027 | 仿真实习  Imitation Practice | 1 | 1.0 | 6 | 18 |
| 14071027 | 化工设计1  Chemical Engineering Design (I) | 1.0 | 1.0 | 4 | 18 |
| 14072027 | 化工设计2  Chemical Engineering Design (II) | 1.0 | 1.0 | 5 | 18 |
| 11510047 | 化工专业实验  Major Experiment of Chemical Engineering | 40学时 | 2.0 | 7 | 1-11 |
| 11680247 | 毕业论文  Graduation Thesis | 12 | 12.0 | 8 | 1-12 |
| 11520047 | 毕业实习  Graduation Practice | 2 | 2.0 | 8 | 14-15 |
|  | 总计  Total |  | 20 |  |  |