Chemical Engineering
Tianjin University

* The information below is extracted from the existing curriculum at the university, which may be adjusted by the university as appropriate. Therefore, please refer to the curriculum used in the year of entry as final curriculum.

1. Program Overview

University/School: School of Chemical Engineering and Technology, Tianjin University

Major: Chemical Engineering

Awarding Degree: Bachelor of Engineering

Duration: 4 years

2. Teaching Outcomes

This programme aims to develop top talents in engineering science and technology with modern scientific literacy, knowledge about liberal arts, sense of social responsibility and professional morality in addition to the mastery of basic theories and professional skills of chemical and related disciplines. Students will be equipped with global insights, innovative mentality and practical capabilities, contributing to the advancement of chemical engineering, energy, material, environment, etc.

3. Curriculum

Key Discipline: Chemical Engineering and Technology

Core Modules: Principles of Chemical Engineering, Chemical Engineering Thermodynamics, Chemical Reaction Engineering, Chemical Engineering Design, Chemical Engineering Safety, etc.

Related Majors: Resource Recycling and Science Engineering, Energy Chemical Engineering, Chemical Engineering and Industrial Bioengineering

Chemical Engineering Teaching Timetable

I. Humanities and Social Science

Com: Compulsory; Opt: Optional

Category	Type	Module Title	Credits	Total Hours	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours	Year 1		Year 2			Year 3			Year 4		
									1	2	Short	1	2	Short	1	2	Short	1	2
Humanities and Social Science	Com	Chinese	4																
	Com	China Overview	3																

II. Maths and Natural Science

Com: Compulsory; Opt: Optional

Category	Type	Module Title	Credits	Total Hours	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours	Year 1		Year 2			Year 3			Year 4		
									1	2	Short	1	2	Short	1	2	Short	1	2
Maths and Natural Science	**Maths**																		
	Com	Advanced Mathematics 2A	6	96	96				6										
	Com	Advanced Mathematics 2B	5	80	80					5									
	Com	Linear Algebra	3	48	48							3							
	Com	Probability Theory	2	32	32								2						
	Com	Data Processing and Numerical Analysis	2.5	40	32		8								2.5				
	Physics		5	91	67	24													
	Com	College Physics	4	64	64					4									
	Com	Physics Experiment A	1	27	3	24						2							
	Chemistry																		
	Com	Inorganic Chemistry and Chemical Analysis 2A	2.5	40	40				2.5										
	Com	Inorganic Chemistry and Chemical Analysis 2B	2.5	40	40					2.5									
	Com	Inorganic Chemistry Experiment 2A	1	25		25			2										
	Com	Inorganic Chemistry Experiment 2B	1	25		25				2									
	Com	Chemical Analysis Experiment	0.5	24		25				4									
	Opt	Advanced Organic Chemistry	2	32	32										2				
	Opt	Surface Chemistry	2	32	32											2			
	Opt	Modern Instrument Analysis	2	32	28	4										2			
	Computer																		
	Com	College Computer Foundation 1	0	48	28		20		3										
	Com	Computer Simulation of Chemical Process	2	48	16		32									2			
	Opt	Computer Software Technology Foundation 2	3	64	40		24					3							
	Opt	Computer Hardware Technology Foundation	2.5	48	32		16						2						
	Opt	Multimedia Application Technology	2	40	24		16						2						
	Opt	Computer Network Foundation	2	32	24		8						2						
	Opt	Database Application Technology	2.5	48	28		20					2							
	Opt	Visual Basic Programming	2.5	48	32		16						2						
	Opt	Java Programming	2	32	28		4						2						
	Opt	Visual C++ Programming	3	56	28		28						2						
Notes	14 credits for Maths (14 credits for compulsory modules);																		

III. Discipline Foundation and Subject

Com: Compulsory; Opt: Optional

Category	Type	Module Title	Credits	Total Hours	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours	Y1-1	Y1-2	Y2-Short	Y2-1	Y2-2	Y3-Short	Y3-1	Y3-2	Y4-Short	Y4-1	Y4-2
		Discipline Foundation																	
Discipline Foundation	Com	Engineering Drawing Foundation 3	3.5	56	52	2	2		4										
	Com	Organic Chemistry A, B	4	64	64							2	2						
	Com	Organic Chemistry Experiment 1	1.5	48		48							3						
	Com	Physical Chemistry 2A	3	48	48					3									
	Com	Physical Chemistry 2B	3	48	48							3							
	Com	Physical Chemistry Experiment 2A	1	26		26				2									
	Com	Physical Chemistry Experiment 2B	1	24		24						3							
	Com	Introduction to Biochemical Engineering	2	32								2							
	Com	Chemical Fluid Flow	2.5	40	40								3						
	Com	Chemical Fluid Heat Transfer	2	32	32								2						
	Com	Chemical Mass Transfer	3	48	48										4				
	Com	Chemical Technology Basic Experiment	1.5	48		48									3				
	Com	Chemical Safety and Environmental Protection	2	32	32											2			
	Com	Instrumental Analysis 1	2	32	32										2				
	Com	Instrumental Analysis Experiment	1	24		24									1.5				
		Subject Core Module																	
		Public Modules																	
Subject	Com	Chemical Machinery Foundation	3	48	48										3				
	Com	Chemical Thermodynamics	3	48	48								3						
	Com	Chemical Reaction Engineering	3.5	56	56										4				
	Com	Chemical Process Analysis and Synthesis	2	32	32											2			
	Com	Professional Experiment	2	64		64										4			
	Com	Introduction to Chemical Design	2	32	32							2							
	Com	Chemical Transfer Process 1	2	32	32										2				
	Com	Chemical Instrumentation and Automation	2	32	32											2			
	Com	Chemical Design	3	48	48											3			
	Com	Introduction to Chemical Engineering 1	2	32	32				2										
		Chemical Engineering Direction																	
	Com	Chemical Separation Process (Bilingual)	2.5	40	40											2.5			
	Com	Chemical Mathematics	3	48	48		8							3					
	Com	Environmental Chemical	2.5	40	40											2.5			
	Com	Reactor Design and Application	2	32	32													2	
	Com	Molecular Design and Chemical Product Process	2	32	32											2			
	Com	Chemical Technology	2.5	40	40											2.5			
Category	Type	Module Title	Credits	Total Hours	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours						Credit Allocation by Semester					

					Year 1		Year 2			Year 3			Year 4		
					1	2	Short	1	2	Short	1	2	Short	1	2
Subject Optional Modules															
Opt	Introduction to Polymers	2	32	32					2						
Opt	Introduction to Food Engineering	2	32	32					2						
Opt	Biomaterials and Tissue Engineering	2	32	32							2				
Opt	Fountation of Fine Organic Synthesis	2	32	32					2						
Opt	General Biology	2	32	32							2				
Opt	Pharmaceutical Foundation	2	32	32					2						
Opt	Biochemistry	2	32	32					2						
Opt	Auxiliary Chemistry	2	32	32					2						
Opt	Environmental Management System	2	32	32							2				
Opt	New Energy Utilization Technology	2	32	32					2						
Opt	Introduction to Catalytic Principles in Energy and Environmental Processes	2	32	32							2				
Opt	Chinese Medicine Engineering Foundation	2	32	32							2				
Opt	Water Pollution Control	2	32	32							2				
Opt	Petroleum Refining Technology	2	32	32							2				
Opt	Chemical Business	2	32	32							2				
Opt	Energy and Chemical Foundation	2	32	32							2				
Opt	Molecular Design and Chemical Product Engineering	2	32	32											2
Opt	New Drug Design and Development	2	32	32								2			
Opt	Polymer Material Molding Processing Principle	2	40	40											2
Opt	Reaction Kinetics Research Methods	2	32	32											2
Opt	Membrane Science and Technology	2	32	32											2
Opt	New Separation Technology	2	32	32											2
Opt	Deactivation and Regeneration of Solid Catalysts	2	32	32											2
Opt	Chemical Innovation Practice	2	32	32									3		
Opt	Catalysis Science and Progress	2	32	32								2			
Opt	Nanoscience and Technology	2	32	32								2			
Opt	Advanced Structure Analysis and Characterization	2	32	32								2			
Opt	Living Polymerization	2	32	32											2
Opt	Powder Technology	2	32	32								2			
Opt	Microfluidics	2	32	32											2
Opt	Functional Polymer Materials1	2	32	32											2
Opt	Structure of Optoelectronic Polymer Materials	2	32	32								2			
Notes	33 credits for Discipline Foundation Modules; 39 credits for Subject Core Modules; 12 credits for Subject Core Modules.														

IV. Practice

Com: Compulsory; Opt: Optional

Category	Type	Module Title	Credits	Weeks	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours	Credit Allocation by Semester										
									Year 1		Year 2			Year 3			Year 4		
									1	2	Short	1	2	Short	1	2	Short	1	2
	Module Design																		
Practice	Com	Chemical Engineering Project 1	1	1W											1				
	Com	Chemical Engineering Project 2	2	2W														2	
	Internship																		
	Com	Cognition Practice	1	1W											1				

Category	Type	Module Title	Credits	Total Hours	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours	Year 1		Year 2			Year 3			Year 4		
									1	2	Short	1	2	Short	1	2	Short	1	2
	Com	Production Practice	2	2W													2		
	Com	Simulation Practice	0.5	16			16										0.5		
Graduation Design (Dissertation)																			
	Com	Graduation Design	10	12W														8	4
	Com	Graduation Dissertation	10	12W															12

V. Innovation and Research

Com: Compulsory; Opt: Optional

Category	Type	Module Title	Credits	Total Hours	Teaching Hours	Experiment Hours	Computer Hours	Practice Hours	Credit Allocation by Semester										
									Year 1		Year 2			Year 3			Year 4		
									1	2	Short	1	2	Short	1	2	Short	1	2
Innovation and Research	**Innovation & Entrepreneurship**																		
	Opt	Introduction to Modern Chemical Design	1	16	16				1										
	Opt	Chemical Engineering Problems in Biological Macromolecule Research	1	16	16					1									
	Cross-Discipline Optional Modules																		
	Opt	MATLAB Scientific Computing	2	32	32							2							
	Opt	English Practice for Science and Technology	2	32	32										2				
	Opt	Introduction to Horticultural Botany	2	32	32								2						
	Opt	Introduction to Electronic Science and Technology	1	16	16								1						
Notes	1 credit for Innovation & Entrepreneurship Modules; 2 credits for Cross-Discipline Optional Modules.																		