Ph.D. Program in Chemical engineering

1. Introduction to Major

The Chemical Engineering Discipline (CED) of Tianjin University is among the earliest state key disciplines with postgraduates programs for master and doctoral degrees in China. It is also among the first group of disciplines to be included into the "211" and "985" Projects of national investment for developing world class universities. CED covers the Chemical engineering department, Chemical engineering research center, State Key Laboratory of Chemical Engineering, National Engineering Research Centre for Industrial Crystallization, National Engineering Research Centre for Distillation, National Applicable Technology Centre for Distillation Column and Internals, National Applicable Technology Centre for Industrial Crystallization and the Tianjin Key laboratory of Membrane Science and Desalination.

The faculty in CED has 32 full professors and 50 associate professors, including a member of Academy of Science and a member of Academy of Engineering of China. A number of young faculty members have been selected into various personal excellence programs in State or municipal levels. Research programs in CED embrace a number of state level key projects including the national key fundamental research projects (973), national high technology projects (863), national science and technology support projects and key projects from the National Natural Science Foundation of China. A large number of research projects come from industries as well. Eight awards of national level and more than ten municipal level awards for science and technology have been earned by the faculty members of the CED.

The main research interests are:

（1）Process intensification and energy saving for distillation systems
（2）Interfacial phenomena and computational mass transfer for Chemical Engineering
（3）Industrial crystallization and particle science and engineering
（4）Membrane science and technology and environmental chemical engineering
（5）Technology for new energy and natural resources utilization
（6）Fine chemical product and new material engineering
（7）Industrial biochemical catalysis and chemical reaction engineering
（8）Chemical process systems engineering

2. Objectives

To prepare students to earn firm fundamental and specified knowledge of chemical engineering, broadened horizon of scientific view, to master skills and right method of R&D in chemical engineering domain, to earn capability to conduct creative academic works independently with skills of leadership and sound ethical personality.

3. Duration

Four years including six months' courses.

4. Courses and Credits

Student must complete a total of no less than 16 credit points, in which at least 6 cpts are degree courses, at least 3 cpts compulsory courses, and at least 7 cpts elcetives.

Course Type	Course code	Course Name	Hours	Points	Note
Degree Courses	B131G002	Marxism in contemporary China	36	2	
	B207G001	Seminars on disciplinary frontier	20	1	
	B207G002	Chemical engineering frontier (bilingual)	60	3	
		Energy chemical engineering	40	2	
Compulsory Courses		Lectures on academic frontiers and academic ethics		1	5 times
	B207R001	Academic presentation		0.5	4 times
		International academic communication		0.5	
		English communication and application		1	
Optional Courses		Public English	60	2	Choose one
		Scientific thesis writing in English	60	2	
		Selected Readings of Marxist classics	18	1	
	B207E001	Computational mass transfer theory and method	40	2	
	B207E002	Modern Particle Science and Crystal Morphology	40	2	
	B207E003	Theory of membranes and membrane processes	40	2	
	B207E004	Contemporary biocatalysis & biotransformation	40	2	
	B207E005	Advanced Reaction Engineering	40	2	
	B207E006	Environmental Chemical Engineering	40	2	
	B131E001	Modern physics and advanced technology	40	2	
	B131R001	Nonlinear mathematics（part one）	32	1.5	
	B131R002	Nonlinear mathematics（part two）	32	1.5	

Optional Courses	B131R003	Applied stochastic processes	32	1.5	
	B131R004	Wavelet Analysis and Applications	60	3	
	B131R005	Selected scientific computation	60	3	
	B131R006	Cone optimization and robust optimization	60	3	
	B131R007	Applied multivariate statistical analysis	60	3	
	S207G039	Membrane Science and Technology	32	2	
	S207E022	Analysis of complex substances	32	2	
	S207E085	Modern Biotechnology and Bioengineering Monographs	32	2	
	S207E011	Multi-stage separation theory	32	2	
	S207E039	Chemical Process Systems Engineering Monographs	32	2	
	S207E026	Engineering optimization method	32	2	
	S207E027	Industrial crystallization and the particle process	32	2	
	S207E077	Principles of adsorptive separation process	32	2	
	S207E078	Adsorption and sorbent	32	2	
	S207E034	Computer Analog of Chemical Separation Engineering Process	32	2	
	S207E014	Heat transfer in multiphase fluidized	32	2	
	S207E053	Drug crystal chemistry	32	2	
	S207E038	Chemical Process CFD	32	2	
	S207G008	Non-traditional Reaction Engineering	32	2	
		*One course beyond the Chem. Eng.			

* To be selected by student from any program other than Chemical Engineering & Technology

5. Dissertation

Please describe the disciplinal requirements of doctor degree dissertation, and that of thesis publication.