

Ph.D. Program in Pharmaceutical Engineering

1 . Introduction to Major

With the fast development of modern pharmaceutical industry and the strong requirement of human health and disease control, the Pharmaceutical Engineering, an interdisciplinary, was founded in the 1990s, on the merge of Chemical Engineering, Life Sciences, Pharmacy and drug regulatory. Pharmaceutical Engineering is focus on drug quality with process efficiency (DQPE), to explore common knowledge and general principles of chemical drugs, traditional Chinese medicines and biologics, to develop manufacturing technology of new molecular entities, and to strengthen drug production processes and quality management. Pharmaceutical Engineering will provide the main technologies for drug research and development and manufacturing processes, and main engineering strategies on implementation of Good Manufacturing Practice, enabling drug manufacturing process on the large scale to be characterized with safety, efficiency, stability, and controllability, and standard management.

Pharmaceutical Engineering Ph.D. program of Tianjin University aims to four factors of drug production: quality, process and efficiency. The main research directions are biopharmaceutical engineering, pharmaceutical separating engineering, traditional Chinese medicines and pharmaceuticals, drug crystallization process engineering, pharmacodynamics and drug evaluation.

2. Objectives

Doctorial students are obligated to have the solid and broad fundamental theories, and systematic and depth technologies and methodologies of pharmaceutical engineering. They will learn pharmaceutical engineering historically from past upto date, and current trend and frontier directions. They will have ability to independently do scientific and technological innovation and work on pharmaceutical engineering researches. They will also be trained in professional ethics with rigorous scholarship and responsibility working style. They are skilled to use principles and methods of pharmaceutical engineering to solve the practical problems of drug R&D and manufacturing process. They are obligated to master a foreign language with high proficiency in reading, writing, listening and oral presentation. After graduation, they would be competent to do research, teaching, and project management in pharmaceutical industry, institutes, and universities.

3. Duration

Duration of doctorial training is four years, of which, half one year for courses study.

4. Courses and Credits

Students 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	Chinese Maxism and Contemporary China	36	2	
	B207G009	Frontier of Pharmaceutical Engineering	60	3	
	B207G001	Seminars on disciplinary frontier	20	1	
Compulsory Courses		Lectures on academic frontiers and academic ethics		1	5 times
	B207R001	Academic report		0.5	4 times
		International academic communication		0.5	Once
		English communication and application	20	1	
Optional Courses		Major course (in English)	60	2	An optional
		Scientific thesis writing in English	60	2	
		Public English	60	2	
	B207E021	Systems Biotechnology and Synthetic Biology	40	2	
	B207E022	Progress of Biopharmaceutical Technology	40	2	
	B207E012	Metabolic Engineering	40	2	
	B207E023	Pharmaceutical Separation Technology	40	2	
	B131R003	Applied Stochastic Processes	30	1.5	
	B131R005	Introduction to Scientific Computing	60	3	
	B131R007	Applied multivariate statistical analysis	60	3	
	B131E001	Introduction to Modern physics and advanced technologies	40	2	
	S210G021	Introduction to bioinformatics	32	2.0	
		Selected Readings of Marxist classics	18	1	
		One course beyond the Chem. Eng.			

