

Ph.D. Program in Biochemical Engineering

1. Introduction to Major

Biochemical Engineering (BioCE) in Tianjin University (TJU) focuses on the application of engineering principles to the development of novel techniques, processing and facilities in biotechnology. As one of first two universities granting master degree in Biochemical Engineering, our PhD program was approved by MOE in 1995 and then a new Department of Biochemical Engineering was established at TJU in 1998. In 2001, BioCE at TJU was ranked as the first national key disciplines among all BioCE program of institutions in China. The faculty of the current BioCE program includes 12 Ph.D supervisors and more than 20 full-time faculty. Among the full-time faculty, one was awarded by Yangtze River Scholar Award, three by Distinguished Young Scholars Award of China and five by New Century Excellent Talents Awards in university from the Ministry of Education of China. Key Laboratory of Systems Bioengineering of the Ministry of Education and Key Laboratory of Bioengineering and Pharmaceutical Engineering in Tianjin are two important research platforms affiliated to BioCE program in School of Chemical Engineering and Technology. In BioCE discipline, many important research works were financially supported by National Basic Research Program (also called 973 Program), State High-Tech Development Plan (863 Program), Key and General NSFC Program, and so on. Areas of research emphasis include: Bioinformatics, Bioseparation Engineering, Bio-reaction and Metabolic Engineering, Biopharmaceutical and molecular biology.

2. Objectives

The purpose of PhD program in BioCE at TJU is to provide a comprehensive chance to shape students' all-round development in ethics, intellect, physique and aesthetics, and understand the fundamental theories, methodology and advanced techniques in bio-processing, have the sound foundation in engineering, have high quality of scientific training, strengthen pioneering and innovation spirit, and capacity in communication and coordination. Graduate students have competitive potential as leading scientist and engineers in the future, and start up their career by undertaking independent scientific researches and engineering design, participating the processing administration, tackling key problems in bioprocessing, upgrading the existing equipments, and developing and promoting novel techniques, processing and facilities.

3. Duration

Completion of the doctoral requirements typically requires 4 years from date of entry, including at least half a year and 16 cpts of coursework.

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 elctives.

Course Type	Course code	Course Name	Hours	Points	Note	
Degree Courses	B131G002	Contemporary China Marxism	36	2		
	B207G004	Frontier in Biochemical and Pharmaceutical Engineering	60	3.0		
	B207G001	Lectures in the Frontier of Chemical Engineering and Related Fields	20	1.0	5	
Compulsory Courses		Lectures on academic frontiers and academic ethics		1		
		Academic report		0.5		
		International academic communication		0.5		
		English communication and application		1		
Optional Courses		Major course (in English)	60	2	An option	
		Writing Skill in Scientific Paper	60	2		
		Public English	60	2		
		B207E011	Molecular and Cell Biology	40	2	
		B131E002	Selected Readings of Marxist classics	18	1	
		B207E012	Metabolic Engineering	40	2	
		B207E013	Advances in Biopharmaceutical Engineering	40	2	
		B207E021	Systems Biotechnology and Synthetic Biology	40	2	
			Molecular and Interfacial Biotechnology	40	2	
		S207E070	Bioprocess Engineering	32	2.0	
		S207E116	Antibody Engineering	32	2.0	
		S207E132	Principles of Bioengineering and Biotechnology	32	2.0	
		S207E133	Molecular simulations of biological processes	32	2.0	

Optional Courses	S207G009	Environmental Biotechnology	32	2.0	
	B131R003	Applied Stochastic Process	30	1.5	
	B131E001	Modern physics and high technology	40	2.0	
	B131R001	Nonlinear Mathematics (first-half)	32	1.5	
	B131R005	Selected Topics in Scientific Calculation	60	3.0	
	B131R007	Multivariate Statistical Analysis	60	3.0	
	S210G021	Introduction to Bioinformatics	32	2.0	

5. Dissertation

The thesis for PhD degree must follow the rules, regulations and format issued by Graduate School, and School of Chemical Engineering and Technology in Tianjin University.