Master of Engineering's Program Biological Engineering

1. Introduction to Major

Biochemical Engineering of Tianjin University commit to the development of biotechnological products, process research and technology, equipment development for a long term. The subject was the first batch of units granting master's degrees in this discipline, and the third batch of Doctor Degree, and it was named the first national key disciplines in 2001. Now it has" The Key Laboratory of Systems Bioengineering "of the Ministry of Education and" The Key Laboratory of Biology and Pharmacy Engineering" of Tianjin province, and have a post-doctoral mobile stations.

This discipline has 12 doctoral tutors, 22 master tutors, including 1 Yangtze river scholar, 3 person that won the China National Funds for Distinguished Young Scientists, five people titled "the Cross-century Talents Cultivation Plan" and "New Century Excellent Talents Cultivation Plan". The discipline undertakes more than 10 research projects including National 973 program, National 863 plan and Key Projects of National Natural Science funds. We have formed several research areas and research teams which focus on biological information analysis and biological product engineering, the efficient production and the protection of ecological environment.

Research Directions:

(1). bioinformatics

(2). biological separation engineering

(3). biological reaction and the metabolic engineering

(4). Biological pharmaceutical engineering

2. Objectives

This area trains advanced engineering technological talents that develop morally, intellectually and physically, who work at industries concerning biochemical technology such as biological medicine, light industry, food, agriculture, ecosystem and environmental protection. Biochemical engineering full-time engineering masters are requested to master the basic theory of biochemical engineering process, scientific method and modern technology, possess solid base of engineering, have scientific literacy, innovation consciousness and communicative ability.

They are also required to work at process development, engineer design, production management, technology breakthrough, equipment transforming, development and popularization of new technology, new manufacture, new equipment independently. They could solve the engineering and manufacturing problems in laboratory and work site, mater a foreign language expertly. They have powerful ability of reading, listening, speaking, writing and translating, and they are qualified engineering technology development and engineering management in technology labs and enterprises.

3. Duration

The master duration is 3 years, in which the course duration is 1 year.

4. Courses and Credit

The master students should complete at least 27 credits, in which no less than 13 credits of degree courses, no less than 6 credits in compulsories, and 8 credits of optical courses.

Course Type	Course Code	Course Name	Hours	Credits	Note
Degree courses	S131G001	Marxist theory course	90	3	
		First foreign language	60	2	
	S131GA05	Mathematical equations	32	2	
	S131GA06	Applied statistics	32	2	
	S207G075	Higher biological reaction engineering	40	2	
	S207G014	Higher biological separation engineering	32	2	
Compulsory courses	S207G040	Biochemical engineering frontier research project	32	2	
	S207E102	Computational Systems Biology	32	2	Choose at least 1 subject
	S207G076	Metabolic engineering	40	2	
	S207R008	Biological process thermodynamics	32	2	
	S207R002	The modern chemical industry new experimental technology	16	1	
	S207R001	Academic report		1	
Optical courses	S207E010	Protein molecular structure and molecular simulation	32	2	
	S207E036	Chemical process analysis and simulation	32	2	
	S207E133	Molecular simulation of biological processes	32	2	No less than 8 credits
	S207E140	Higher biological chemistry (experiment included)	48	3	
	S207G009	Molecular and Cellular Biology	32	2	
	S207E070	Biological process engineering	32	2	
	S207E071	Biomedical Engineering	32	2	
	S207E141	Microbiology (experiment included)48	48	3	
	S207G072	Principle of chemical process（I+II）	40	2	

Optical courses	S207G033	Environmental Bioengineering	32	2	
	S207E132	Principles of Bioengineering and Biotechnology	32	2	
	S210G021	An introduction to bioinformatics	32	2	
	S207E116	Antibody engineering	32	2	
	New	Gene	32	2	

5. Academic dissertation

Master's degree thesis work complies with the relevant provisions of dissertation work of Tianjin University and School of Chemical Engineering and Technology.