

Master's Program in Processing Equipment and Control Engineering

1. Introduction to Major

The discipline of Process Equipment and Machinery was founded in the 20th century, 50's, to adapt to the needs of talents in modern chemical engineering industry. During the last six decades. The discipline of Process Equipment and machinery committed to the research and development of large equipments in many key industries in national economy, like petrochemical, energy, light industry, medicine, environmental protection, etc. A tight integration of process research and equipment research was emphasized. Great contributions were made to the creation of novel, efficient, energy saving equipments and the guarantee of a safe and normal operation. Since 1956, The department has started to recruit postgraduate students in. It is entitled to grant master degrees, doctoral degrees and post-doc positions. There are 7 professor, 6 PhD advisors, and 10 associate professors in the department. Funding consists of State 863 Projects, National Natural Science Foundation of China, Tianjin Key Science and Technology Projects and many other research projects funded from industries.

Major research directions include: The reliability of process equipment, solid-liquid separation technology and equipment, process control and testing technology, energy efficiency technology.

2. Objectives

Students should be equipped with solid basic theoretical knowledge, the experimental skills and designing methods about the developing, designing and manufacturing of process equipment and machinery. Students should be able to individually conduct research, teaching and technical responsibility in process equipment and machinery field. Capability of creation and mastering of a foreign language are required. Master degree graduates will be able to work in chemical, petroleum, energy, pharmaceutical, light industry, environmental protection and other departments, engaged in scientific research, teaching, design, development, production and management.

3. Duration

2.5-3 years. 1 year to finish courses.

4. Courses and Credit

Student must complete a total of not less than 27 credit points, in which at least 13 cpts are degree courses, at least 6 cpts compulsory courses, and at least 8 cpts optional ones.

| Course Type | Course Code | Course Name | Course Hours | Credit Points | Note |
|----------------|-------------|---|--------------|---------------|-----------------------|
| Degree Courses | S131G001 | Theory of Marxism | 90 | 3 | Not Less Than 13 Cpts |
| | S131GF06 | Listening and Speaking | 60 | 2 | |
| | S131GF06 | Advanced Listening and Speaking | 60 | 2 | |
| | S131GF07 | Integrated English | 60 | 2 | |
| | S131GA02 | Matrix Theory | 32 | 2 | |
| | S131GA03 | Numerical Analysis in Engineering and Science | 32 | 2 | |
| | S131GA04 | Stochastic Processes | 32 | 2 | |
| | S131GA05 | Equations of Mathematical Physics | 32 | 2 | |
| | S131GA06 | Applied Statistics | 32 | 2 | |
| | S131GA07 | Optimization Methods | 32 | 2 | |
| | S207G027 | Thermal dynamics | 32 | 2 | |
| | S207G021 | Transfer principle of Chemical Engineering (I+II) | 40 | 2 | |

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| Compulsory Courses | S207G020 | Solid mechanics fundamentals of process equipment | 32 | 2 | Not Less Than 6 Cpts |
| | S207G037 | Fluid Dynamics | 32 | 2 | |
| | S207R002 | Experimental Skills and Society Practice | | 1 | |
| | S207R001 | Academic Reports | | 1 | |
| Optional Courses | S207E028 | Mechanical behaviors of solid materials | 32 | 2 | Not Less Than 8 Cpts |
| | S207E029 | Principles of solid liquid separation and application technology | 32 | 2 | |
| | S207E035 | Modern test technology and theory for separation technique in chemical engineering | 32 | 2 | |
| | S207E083 | Principles of Water and Wastewater Treatment Technologies | 32 | 2 | |

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| | S207E122 | Dynamics of solid-liquid phases | 32 | 2 |
| | S207E023 | Dry process and equipment technology | 32 | 2 |
| | S207E020 | Introduction of Powder Engineering Technology | 32 | 2 |
| | S207E090 | Design methods and assessment of pressure vessel | 32 | 2 |
| | S207E124 | Failure analysis of process equipment | 32 | 2 |
| | S207E075 | Reliability of micro-system packaging | 32 | 2 |
| | S207E125 | Advanced control techniques of process equipment | 32 | 2 |
| | S207E123 | Optimization of Process energy systems | 32 | 2 |
| | S207E117 | Ultrasonics Sonochemistry | 32 | 2 |
| | S207E095 | Medicines Preparation Process and Equipment | 32 | 2 |

5. Degree Dissertation

Master degree thesis should be conducted according to the regulations of thesis in School of Chemical Engineering and Technology, Tianjin Unversity.