# Ph.D. Program in Applied Chemistry (Polymer Science and Engineering)

## 1. Introduction to Major

Polymer science and engineering as a cross-disciplinary is a branch of chemistry that studies the synthesis, molding process and application of polymer materials. Especially, in 21st century, polymer science and engineering plays important roles for the technology developments in various areas, and has thereafter been developed to be an integrated science branch with quite many sub-branches such as nanomaterials, medical polymer materials, multi-functional polymer materials, etc. As a major in engineering university, polymer science and engineering in Tianjin University focus on the living polymerization techniques, functional materials, medical polymer materials, tissue engineering.

The research fields include:

（1）Nanomaterials

（2）Medical polymer materials

（3）Tissue engineering

（4）Multi-functional polymer materials

（5）Living polymerization techniques

## 2. Objectives

The objective of Applied Chemistry (polymer science and engineering) is to train high level creative professional talents in teaching, scientific research. The PhD students will have the solid chemical basis of knowledge, the basic theory, basic experimental skills related engineering and technical knowledge and computer application ability. They will also have scientific thinking and scientific experiments training for basic research and applied basic research aspects. They will be able to independently and creatively engage in scientific research. They will have the ability to carry out the larger scientific research and technology development projects. They have good scientific literacy and professionalism to work in polymer science and engineering in research, teaching, technology and relative management.

## 3. Duration

The duration for the whole graduate study is four years and the course-learning duration is one or two semesters.

## 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 | 40 | 2 | |
| | B207G001 | Frontiers of catalysis science and engineering | 20 | 1 | |
| | B207G011 | Progress in Material Chemistry & Engineering | 60 | 3 | |
| Compulsory Courses | | Lectures on academic frontiers and academic ethics | 20 | 1 | |
| | B207R001 | Academic report | | 0.5 | |
| | | International academic communication | | 0.5 | |
| | | English communication and application | 20 | 1 | |
| | B207G001 | Frontier of Chemical Engineering | | 0.5 | |
| Optional Courses | B131GF05 | Public English | 60 | 2 | |
| | B207E | Scientific thesis writing in English | 60 | 2 | |
| | B131E002 | Selected Readings of Marxist classics | | | |
| | B131E001 | Introduction to Modern physics and advanced technologies | 40 | 2 | |
| | B131R001 | Nonlinear Mathematical Analysis (Part 1) | 30 | 1.5 | |
| | B131R002 | Nonlinear Mathematical Analysis (Part 2) | 30 | 1.5 | |
| | S207G017 | Biomedical Polymers | 32 | 2 | |
| | | Frontier of polymerization catalysis | 32 | 2 | |
| | S207E130 | Artificial organs and tissue engineering | 32 | 2 | |
| | S207G016 | Progress in Polymer Science | 32 | 2 | |
| | S207G012 | New Technology of Fine Organic Synthesis | 32 | 2 | |
| | | Macromolecular Reaction Engineering | 20 | 1 | |

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|---|---|---|---|---|---|
| | | One course beyond the Chem. Eng. | | | |

## 5. Dissertation

The related work of Ph.D. thesis must be carried out according to the regulations of Tianjin University. The requirements of paper publication during the postgraduate period must be executed according to the related regulations of the school of chemical engineering and technology of TJU.