清华大学-澳大利亚墨尔本大学联授博士学位项目培养方案

（2020 级）

This document applies to all PhD candidates in the Chemical Engineering and Technology of Jointly Awarded PhD Degree program between University of Melbourne and Tsinghua University.

1. Program Mission Statement

Jointly Awarded PhD Degree is to encourage students to develop an in-depth understanding of the fundamental concepts of Chemical Engineering, while, at the same time, broadening their perspective by sampling other research and education environments. Moreover, this Jointly Awarded Degree Program should enhance the development of cooperative research collaboration between two Departments.

2. Admission of Program

Each of the Partner Department must independently arrange for admission of the PhD candidate in accordance with their own procedures and according to their selection criteria and other entrance requirements. Applicants for PhD candidature should complete online applications for each University. The financial arrangements between partner departments for students support and examinations should be agreed to in each case.

3. Duration of Program

PhD candidate should spend a minimum of 18 months at Tsinghua University and a minimum of 12 months at the University of Melbourne in a way which enables PhD candidate to meet the PhD Program requirements at each Department. A Prolonged period may be approved upon application, which should be made 3 months before the expiry of the period of the agreement.

4. Supervision

The candidate shall have at least one supervisor in each Department. Both supervisors are responsible for the progress of the doctoral degree work. The supervisors undertake to perform joint exercise of their advisory function in respect of the doctoral degree candidate in compliance with the current regulations at each University. They also undertake to consult each other regularly concerning the progress of the research work.

5. Program Procedures Requirements

- Personal studying plan

  PhD candidate must complete his/her personal studying plan under supervisor（s）consulting in the first months after registration, and then submit it to the departmental Graduate Program Office at Tsinghua University.

- Qualifying Examination

  All PhD candidates should complete Qualifying Examination at the lead University. Exceptions to this policy due to extenuating circumstance must receive prior approval by the Graduate Officer at both Departments.

● Thesis Proposal/Confirmation of candidature

Because it is a key point in candidature, each PhD candidate must complete this procedure and be agreed to by both supervisors. This examination consists of both written (about 5,000 words report) and oral (20-30 presentation) components in a way which enables PhD candidate to meet the PhD Program requirements at each Department.

● Progress Review

Each PhD candidate is required to complete written and oral progress review annually. The Progress review provides an opportunity for supervisors, advisory committee both in home and host universities to review and evaluate progress on the research project, and to alert any potential difficulties in candidature.

● Final Thesis presentation/Completion Seminar

Each PhD candidate is required to make a presentation of their research findings at home/host University in the three to six month prior to submitting their thesis for examination.

● PhD Thesis

The PhD thesis is written succinctly and in good English. The normal length of a PhD thesis is 60,000-80,000 words, exclusive of words in tables, maps, bibliographies and appendices. Each PhD thesis must plus an 800-1000 word abstract in Chinese.

● Examination

Each PhD thesis needs four examiners normally. Two examiners are nominated by the University of Melbourne; other two examiners are nominated by Tsinghua University.

● Thesis Defense

Each PhD candidate need conduct Thesis Defense. Normally video conference is available for PhD candidate from the University of Melbourne, while Exceptions to this policy due to extenuating circumstance must receive prior approval by both Universities.

● Degree Requirements in Innovation Achievements.

During studying period, each PhD candidate from Melbourne side must meet the requirement, which is given when they do first registration at Tsinghua University.

● Social Practice

Detailed requirements shown in regulation as 'Management method of compulsory process in social practice for doctoral students in Tsinghua University'.

● Academic activities

Each PhD candidate should attend ample academic activities to meet minimum requirements from both universities.

6. Credit Requirements

Ⅰ、Ph.D. candidate with master degree

Ph.D candidate with Master degree must receive at least 14[1] credits from the following course list:

1、Public compulsory courses（≥4 Credits）

- Philosophy and/or history 2 Credits
- Language 2 Credits

[1] [1] 此项目清华大学研究生需在此培养方案基础上再增加 1 学分的学术与职业素养课程（必修）。

2、Specialized courses（≥5 Credits）

Each PhD candidate should select one course (3 credits) in the following list that is provided by the Department of Chemical & Biomoledular Engineering, University of Melbourne, and other courses (≥2Credits) that are provided by the Department of Chemical Engineering, Tsinghua University.

● Advanced Thermo &Reactor Engineering	CHE N90007	3 Credits	Melbourne
● Minerals, Materials and Recycling	CHEN90010	3Credits	Melbourne
● Bioenvironmental Engineering	CHEN90011	3 Credits	Melbourne
● Advanced Heat & Mass Transport Processes	CHEN90019	3 Credits	Melbourne
● Carbon Capture and Storage	CHEN90027	3 Credits	Melbourne
● Computational Fluid Dynamics	CHEN90024	3 Credits	Melbourne
● Research Methods	CHEN90034	3 Credits	Melbourne

Gradated Curriculum in Chemical engineering or other related disciplines（≥5 Credits）

3、Compulsory courses（5 Credits）

● Literature Review and Thesis Proposal	（99990041）	1 Credit
● Academic Activities	（99990032）	2 Credits
● Qualifying Examination	（99990061）	1 Credit
● Social Practice	（69990041）	1 Credit

4、Self-study courses

Doctoral students shall freely select other curriculums for research topic need, by petition to the academic advisor, but credits cannot calculate for the degree.

5、Complementary courses

Ph.D candidate who has master degree but not in Chemical Engineering must complete at least two specialized courses from following list as supplements, but credit cannot be calculated for the degree:

● Principles of Transport Processes of Chemical Engineering	（70340073）	3 Credits
● Advanced Chemical Engineering Thermodynamics	（70340063）	3 Credits
● Principles of Advanced Chemical Reaction Engineering	(70340193)	3 Credits
● Chemical Process Optimization and Integration	（70340153）	3 Credits

Ⅱ、 Ph.D. candidate with bachelor’s degree

Ph.D candidate with bachelor degree must receive at least 29[2] credits from follow courses list:

1、Public compulsory courses（5 Credits）

- Philosophy and/or history 3 Credit
- Language 2 Credits

2、Specialized courses（≥19 Credits）

（1）Basic courses（≥3 Credits）

Mathematics courses

- Advanced Numerical Analysis （60420024） 4 Credits

Chemistry courses

- Advanced Physical Chemistry （70440013） 3 Credits
- Advanced Organic Chemistry （70440023） 3 Credits
- Advanced Inorganic Chemistry （70440023） 3 Credits

If bachelor degree is not in chemical engineering, Ph.D candidate would take a basic course in previous discipline to replace above mathematics course, by petition to the academic Supervisor.

（2）Gradated Courses in Chemical engineering that are provided by Melbourne and Tsinghua University（≥16 credits）

Specialized basic courses（Select3 from 4, by petition to the academic advisor）

- Principles of Transport Processes of Chemical Engineering（Chinese & English） （70340073） 3 Credits
- Advanced Chemical Engineering Thermodynamics （70340063） 3 Credits
- Principles of Advanced Chemical Reaction Engineering (70340193) 3 Credits
- Chemical Process Optimization and Integration （70340153） 3 Credits

Each PhD candidate of the Jointly Awarded PhD Degree Program between the University of Melbourne and Tsinghua University should select 2 courses in the following list(NO more than 6 credits) that are provided by the Department of Chemical & bimoledular, University of Melbourne to replace similar courses that are provided by Tsinghua University:

[2] 此项目清华大学研究生需在此培养方案基础上再增加 1 学分的学术与职业素养课程（必修）。

● Advanced Thermo &Reactor Engineering	CHE N90007	3 Credits	Melbourne
● Minerals, Materials and Recycling	CHEN90010	3Credits	Melbourne
● Bioenvironmental Engineering	CHEN90011	3 Credits	Melbourne
● Advanced Heat & Mass Transport Processes	CHEN90019	3 Credits	Melbourne
● Carbon Capture and Storage	CHEN90027	3 Credits	Melbourne
● Computational Fluid Dynamics	CHEN90024	3 Credits	Melbourne
● Research Methods	CHEN90034	3 Credits	Melbourne

If bachelor degree is not in chemical engineering, Ph.D candidate would take a specialized basic course in previous discipline to replace above courses, by petition to the academic supervisor.

Other Specialized courses:

● Biochemical Reaction Engineering	（70340102）	2 Credits
● Bioseparation Engineering（English）	（70340132）	2 Credits
● Cell Culture Technology	（80340192）	2 Credits
● Molecular Enzyme Engineering	（80340222）	2 Credits
● Mathematical Analysis in Chemical Engineering	（70340172）	2 Credits
● Chemical Kinetics and Reaction Mechanisms（English）	（80340172）	2 Credits
● Computer Simulation and Its Advances in the Studies of Properties of Fluids	（80340162）	2 Credits
● HAZOP Analysis	（80340432）	2 Credits
● Surface Science and Heterogeneous Catalysis（English）	（80340112）	2 Credits
● Environmental Biotechnology（English）	（80340122）	2 Credits
● Fundamental of Membrane Separation Engineering	（80340102）	2 Credits
● （Advanced）Separation Process	（70340142）	2 Credits
● Engineering Fundamental of Liquid-Liquid Extraction	（70340122）	2 Credits
● Colloid and Interface Science	（80340153）	3 Credits
● Micro-reactors and micro-mixing technology	（80340261）	1 Credit
● Analysis of Materials Microstructure	（70350073）	2 Credits
● Fundamentals of Materialogy	（70350043）	3Credits

● Nuclear Fuel Circulation Strategy	（91010022）	2 Credits
● Hydrogen Energy Engineering	（71010292）	2 Credits
● Green Batteries	（81010252）	2 Credits
● Introduction of the processing and equipment for the nuclear fuel reprocessing	（71010192）	2 Credits
● Solvent Extraction Chemistry and Technology	（71010172）	2 Credits
● Frontiers of Polymer Material Science	（80340012）	2 Credits
● Contemporary Polymer Chemistry	（70340013）	3 Credits
● Advanced Instrumental Analysis of Polymers	（70340033）	2 Credits
● Structure and Properties of Polymers	（70340023）	3 Credits
● Advanced Functional Polymers	（80340092）	2 Credits
● The Surface and Interface of Polymer Materials	（80340032）	2 Credits
● Principle and Practice of Water-borne Polymer System	（80340272）	2 Credits
● Drug Delivery: Principles and Technologies	（80340412）	2 Credit
● Advanced experiments of chemical engineering	（80340442）	2 Credits
● Material Chemical Engineering	（80340452）	2 Credits
● Generality of low-carbon process	（80340462）	2 Credits
● Frontiers in Synthetic biology	（80340472）	2 Credits
● Nano biotechnology	（80340482）	2 Credits
● Soft Matter Physics	（80340492）	2 Credits
● Advanced Biological Science and Engineering （English）	(80340502)	2 Credit
● Recent Advances in Separation Processes （English）	(80340512)	2 Credit
● Metabolic Engineering	（70340182）	2 Credits
● Crystallization Principles of Inorganic Materials	（80340522）	2 Credits
● Circular Economy for Chemical Industry	（80340531）	1 Credit
● Chemical Process Control	（80340542）	2 Credits

- Risk Control and Management of Research Laboratory （70340201） 1 Credit
- Chemical Engineering Techno-Economics （80340552） 2 Credits
- Other curriculums for graduate students provided by Department of Chemical Engineering

According to the dissertation requirements, Doctoral students in chemical engineering shall select relevant disciplines graduate courses (only calculated 2 credits), by petition to the academic advisor. Other selected curriculums only record the scores, of which the credits are excluded from total degree credits.

3、Compulsory courses（5 Credits）

- Literature Review and Thesis Proposal （99990041） 1 Credit
- Academic Activities （99990032） 2 Credits
- Qualifying Examination （99990061） 1 Credit
- Social Practice （69990041） 1 Credit

4、Self-study or optional courses

Doctoral students shall freely select other curriculums for research topic need, by petition to the academic advisor, but credits cannot calculate for the degree.