**School of Environment**

Ph.D. Program for International Students

Ⅰ Subject and Major

Environmental Science and Engineering

Ⅱ Credits Requirement

During the study for Ph.D. degree, at least 16 credits are demanded to acquire the degree, which includes at least 4 credits for public compulsory courses, no less than 7 credits for subjective specialized courses （containing at least 3credits for basic theory courses and no less than 4credits for basic theory and specialized courses of the subject or other relevant major）, as well as at least 5 credits for compulsory study course. Self-study courses excluded.

Ⅲ Curriculum Plan

**1. Public Compulsory Courses (4 credits)**

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| * Basic Chinese／Chinese |  | | 2 credits (examination) |
| * Chinese Culture and Society |  | 2 credits (examination) | |

Requirement for Chinese courses: level of Chinese courses should be selected based on grade of the Chinese level test taken when entering the university.

**2. Subjective Specialized Courses (≥7 credits)**

**(1) Basic theory courses (selection from the following courses ≥3 credits)**

Advanced Numerical Analysis (taught in Chinese) 60420024 4 credits (examination)

Numerical Analysis A (taught in Chinese) 60420044 4 credits (examination)

Numerical Analysis **(taught in English)**  60420254 4 credits (examination)

Other mathematical graduate courses

Advanced Environmental Chemistry **(taught in English)**

70050323 **3** credits (examination)Fundamentals of Environmental Biotechnology

**(taught in English)**70050313 3 credits (examination)

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| * Advanced Numerical Analysis | 60420024 | 4 credits (examination) |
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| * Advanced Environmental Chemistry | 70050323 | 3 credits (examination) |
| * Fundamentals of Environmental Biotechnology | 70050313 | 3 credits (examination) |
| Other relevant basic theory courses offered by chemistry department, chemical engineering department, biology department, department of hydraulic engineering, department of civil engineering etc. for graduate students |  |  |

**(2) Basic theory courses and specialized course of the subject or other relevant subjects (≥4 credits, selection under the guidance of supervisor)**

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| * Introduction to Sustainable Development | 90050012 | 2 credits (examination) |
| * Advanced Wastewater Treatment**(taught in English)** | 80050233 | 3 credits (examination) |
| * Advanced Water Supply Engineering**(taught in English)** | 80050203 | 3 credits (examination) |
| * Advanced Water Distribution System and Management**(taught in English)** | 80050193 | 3 credits (examination) |
| * Air Pollution Control Technology**(taught in English)** | 80050283 | 3 credits (examination) |
| * Integrated Solid Waste Management **(taught in English**) | 80050273 | 3 credits (examination) |
| * Hazardous Waste Disposal Technology**(taught in English)** | 80050263 | 3 credits (examination) |
| * Environmental Management and Policy**(taught in English)** | 80050213 | 3 credits (examination) |
| * Restoration Ecology and Application**(taught in English)** | 80050243 | 3 credits (examination) |
| * Global Environmental Issues**(taught in English)** | 80050253 | 3credits (investigation) |
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| * Operational Research | 70250124 | 4 credits (Examination) |
| * Theory of environmental systems modeling and complex models | 80050092 | 2 credits (Examination) |
| * Environmental Fluid Mechanics | 70040123 | 3 credits (Examination) |
| * Aerosol science and technology | 70050012 | 2 credits (Examination) |
| * Process Chemistry for Water and Wastewater Treatment | 70050062 | 2 credits (Examination) |
| * Chemistry and Physics of Air Pollution | 70050032 | 2 credits (Examination) |
| * Transport Dynamics of Pollutants in Porous Media | 70050082 | 2 credits (Examination) |
| * Advanced Water Treatment Engineering | 70050042 | 2 credits (Examination) |
| * Modeling and New Technology for Biological Wastewater Treatment | 70050262 | 2 credits (Examination) |
| * Principle of Air Pollution Control | 70050022 | 2 credits (Examination) |
| * Pollution Control Engineering of Solid Wastes | 70050102 | 2 credits (Examination) |
| * Environmental Planning | 80050082 | 2 credits (Examination) |
| * Ground Water Pollution Control and Remediation | 70050172 | 2 credits (Examination) |
| * Advanced Environmental Chemistry | 70050182 | 2 credits (Examination) |
| * Modern Environmental Biology | 70050072 | 2 credits (Examination) |
| * Environmental Economics | 70050162 | 2 credits (Examination) |
| * Solid Waste Treatment and Resources Recovery | 70050092 | 2 credits (Examination) |
| * Energy and Environment | 80050012 | 2 credits (Examination) |
| * Environmental Nuclear Radiation and Its Tracer Technique | 70050252 | 2 credits (Examination) |
| * Environmental Risk Analysis | 70050112 | 2 credits (Examination) |
| * Environmental Protection Investment and Finance * Challenges for Advanced Water technology: Global Seminars   **(taught in English)** 80050432 2 credits (Investigation)   * Biofilms: fundamentals to applications   **(taught in English)** 80050422 2 credits (Investigation) | 80050152 | 2 credits (Examination) |

**(3) Compulsory Study (5 credits)**

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| --- | --- | --- |
| * Literature Review and Research Proposal | 99990041 | 1 credits (investigation) |
| * Seminars | 99990032 | 2 credits (investigation) |
| * Qualifying Exam | 99990061 | 1 credits (examination) |
| * Social Practice (substitutable with other specialized courses) | 69990041 | 1 credits (investigation) |

**4. Self-study courses**

Systematic self-study on research topic related specialized knowledge should be developed under the guidance of supervisor, which can be listed into Ph.D. program.

**5. Restudy courses**

All Ph.D. students lack of master level basis to the subject should restudy relevant courses under the guidance of supervisor. Restudy courses could be listed in the non-degree courses.

Ⅳ Main Process and Related Demand

Same as the Ph.D. program for normal Ph.D.

**1.Formulate Curriculum Plan**

Ph.D. students should formulate curriculum plan under supervisor’s guidance within three weeks after enrollment and should hand in the hard copy plan to the department in charge of graduate students. If changed is needed to the curriculum plan, it should be done during course selection period of the semester. After the changes, students should hand in the plan again with supervisor’s signature.

**2. Dissertation Proposal**

A dissertation proposal must be presented and approved at least twelve months before the dissertation defense. The proposal should include literature review, selection of topic and the significance, main research contents, characteristics and difficulties, expected results and possible innovations. The proposal should be prepared in consultation with the dissertation committee. The outcome of the proposal defense is decided by the dissertation committee. Potential outcome include failure and pass. Successful completion of the dissertation proposal defense is a significant milestone towards completion of the Ph.D. degree.

**3. Qualifying Examination**

The intent of the qualifying examination is to ascertain the breadth of the student’s comprehension of fundamental facts and principles that apply in their major fields of study and whether the students has the ability to think incisively and critically about the theoretical and the practical aspects of these fields. The examiners should satisfy themselves, by unanimous vote, that the student demonstrated sufficient content command and ability to design and produce an acceptable dissertation. The examination will ordinarily be taken in the second (students with master’s degree) or forth (students without master’s degree) semester of the doctoral program, and passing of the examination gives students the advancement to candidacy.

**4. Social Practice**

It should be implemented according to The Social Practice of Required Steps Regulation for graduate students in Tsinghua University.

**5. Academic Activities and Reports**

Graduate students should do an academic report at least once a semester and should at least once read out his or her own academic paper in national or international academic conferences. Graduate students should attend at least 30 academic reports which will be recorded with ID cards during study time.

**6. Requirements for publications**

Graduate students should publish 2 SCI papers or 1 SCI paper and 2 EI papers or 1 SCI paper with the IF >2.0. SCI papers with IF<0.5 will be regarded as EI papers.

**7. Dissertation of Defense**

The dissertation defense will occur after completing the committee’s requirements. It is required that the Ph.D. dissertation leads to published papers on peer-reviewed journals with at least 2.0 of impact factors in total for review prior to scheduling a Ph.D. dissertation defense. Doctoral defenses are open to the public. Candidates are required to submit the details (date, time location) of the meeting, a dissertation abstract, and a listing of all committee members to the administrative staff prior to the scheduled defense. Potential outcomes include failure and a pass, and are decided by majority vote of the committee. Failure of the thesis defense requires that a student substantially rework the dissertation and defend the modified dissertation within twelve months. Candidates passing the dissertation defense are typically required to modify the dissertation as directed by the committee. In either case the candidate will be informed of the outcome in a meeting with the advisor.

Remark: this Ph.D. program was discussed and approved by degree committee of Environmental Science and Engineering on Jun.12th.2015, and should be applied for international PhD students who enter school after Jun.12th.2015.