

國立清華大學工程與系統科學系
博士班資格考初試辦法
Department of Engineering and System Science
National Tsing Hua University
PhD Qualification Preliminary Exam Rules

The rules are approved by the Departmental Affairs Meeting on December 28, 2011

100 年 12 月 28 日系務會議修訂通過

1. 博士班資格考初試選考科目如下：

The subjects covered in the PhD Qualification Preliminary Exam include:

Principles of Nuclear Engineering (核工原理)、Nuclear Radiation Measurement (輻射度量)、Engineering Thermodynamics(工程熱力學)、Heat Transfer(熱流學)、Fluid Mechanics (流體力學)、Principles of Microsystem Engineering (奈微米系統工程原理)、Advanced Nanotechnology (奈米科技進階)、Computational Materials Science (計算材料科學)、Physical Metallurgy(物理冶金)、Thermodynamics of Materials(材料熱力學)、Introduction to Solid State Physics (固態物理導論)、Physical Chemistry (物理化學)、Principles of Electrochemistry (電化學原理)、Modern Physics (近代物理)、Quantum Mechanism (量子力學)、Plasma Engineering (電漿工程)、Electromagnetics (電磁學)、Semiconductor Devices Physics (半導體元件物理)、Circuits Analysis (電路學)、Electronic Devices (電子元件)、Electronic Systems (電子系統)

2. 學生應自上述科目選考其中二科，且繳交筆試申請單/結果通知單，如未通過課程與研究計劃書審查者，於申請資格考筆試時，需同時繳交該計劃書。一旦向系辦公室登記參加，便不可以要求退出，如未參加考試，便以零分計。

All students are required to take 2 subjects listed above as their Preliminary Exam subjects and hand in the exam application form. Students who have not passed the review of Courses and Research Plan should hand in the Courses and Research Plan Application Form when applying for the exam. Once completing the registration, students cannot cancel the exam. Students absent from the exam will get a score of 0.

3. 資格考初試各科通過成績不得低於七十分，學生對成績有疑議者，可於成績公告後一週內，書面提出複查申請送交系辦。系上收到申請後，調閱試卷送交命題老師再次審閱並回覆結果，最後將複查結果書面通知學生。

The minimum requirement of score for each subject in the Qualification Preliminary Exam is 70 out of 100. If students have any doubt about their scores, they can apply for their score review to

the Department within one week after the exam results are announced. When the Department receives the application, the answer sheets of the applicant will be sent to examiners for reviewing. After receiving the review results from the examiners, the Department will reply the result of score review to the applicant.

4. 學生修習下列本系研究所課程成績等級 A-以上(含)，即可申請抵免資格考初試，送交課程委員會審核並公佈結果。研究所課程與選考科目抵免關係如附表一。

Students who taking the graduate program courses listed in Table 1 and achieving a minimum of A- (include), are eligible to apply for exempting from taking one or two subjects in the Qualification Preliminary Exam. The Curriculum Committee of the Department will review the application and announce the results. The corresponding table of graduate program courses and exemptible exam subjects refer to the Table 1.

反應器物理一 (Reactor Physics I)、Principles in Photon & Particle Measurements (光子與粒子度量原理)、Nuclear Reactor Engineering (反應器工程)、Advanced Heat Transfer (高等熱流學)、Two-Phase Flow & Boiling Heat Transfer (雙相流與沸騰熱傳)、Micro System Design (微系統設計)、Advanced Nanotechnology (奈米科技進階)、Computational Materials Science (計算材料)、Advanced Physical Metallurgy (高等物理冶金)、Thermodynamics of Solid State (固態熱力學)、Solid State Physics I (固態物理一)、Introduction to Soft Condensed Matter (軟物質科學導論)、Bioanalytical Chemistry: Basic Principles and Lab Projects (生化分析與實驗)、Neutron and X-Ray Small Angle Scattering (中子與 X 光小角度散射)、Neutron and X-Ray Small Angle Scattering (同步加速器光源應用)、Molecular Dynamics Simulations (分子動力學模擬)、Plasma Engineering and Applications (電漿工程應用)、Microwave Engineering (微波工程)、Semiconductor Devices Physics (半導體元件物理)、Mixed-Signal Integrated Circuit Design (混合訊號積體電路設計)、Microelectronic Engineering (微電子工程)、Organometallic Chemistry (有機金屬化學)

5. 資格考初試每學期舉辦一次，學生應於入學後二內年(休學不計入年限)最多二次考試機會中通過初試，未通過考核者，應予退學。

(*意即：資格考初試每學期舉辦一次，學生應在最多二次考試機會中，通過選考之二科目。)

The Qualification Preliminary Exam is held every semester. Students have, at most, two chances to pass two subjects within 2 years after enrollment (not including suspended). Students failed in achieving this requirement have to drop out.

(Note that students can only take the exam twice within two years after enrollment even if the subject taken in each exam is less than two.)

6. 學生擬參加資格考初試的學期，務必要註冊。休學中的學生不可以參加資格考初試。

Students attending the Qualification Preliminary Exam must register in the same semester. Students cannot attend the Qualification Preliminary Exam during suspension of schooling.

7. 最新博士班資格考初試選考科目及參考用書(或範圍)請參考系網頁公佈之內容。

Refer to the Department website for updated exam subjects and references.

8. 本初試辦法適用於 101 學年度(含)以後入學之學生，100 學年度(含)以前入學之學生，得由本初試辦法或原筆試辦法中擇一施行。

The Qualification Preliminary Exam rules are applied on students who are enrolled in/after 2012.

Students enrolled in/before 2011 can decide to follow either the rules in this Qualification Preliminary Exam or the ones listed in the former qualification written exam.

9. 本辦法經系務會議通過後實施，修正時亦同。

The rules come in force after approved in Departmental Affairs Meeting, likewise for revision of the rules.

附表一：研究所課程與選考科目抵免關係表

Table 1: The corresponding table of graduate program courses and exemptible exam subjects

編號 No.	選考科目 exam subjects	研究所課程 (Course No.) graduate program courses
1	核工原理 Principles of Nuclear Engineering	ESS5110 反應器物理一 (ESS5110) Reactor Physics I
2	輻射度量 Nuclear Radiation Measurement	ESS4050 光子與粒子度量原理 (ESS4050) Principles in Photon & Particle Measurements
3	工程熱力學 Engineering Thermodynamics	ESS5410 反應器工程 (ESS5410) Nuclear Reactor Engineering
4	熱流學 Heat Transfer	ESS5430 高等熱流學 (ESS5430) Advanced Heat Transfer
5	流體力學 Fluid Mechanics	ESS6430 雙相流與沸騰熱傳 (ESS6430) Two-Phase Flow & Boiling Heat Transfer
6	奈微米系統工程原理 Principles of Microsystem Engineering	ESS5850 微系統設計 (ESS5850) Micro System Design
7	奈米科技進階 (原"奈米科技導論") Advanced Nanotechnology (former "Introduction to Nano-Technology")	TIGP5504 奈米科技進階 (原"奈米科技導論二") (TIGP5504) Advanced Nanotechnology (former "Introduction to Nano-Technology")
8	計算材料科學 Computational Materials Science	TIGP5502 計算材料 (TIGP5502) Computational Materials Science

9	物理冶金 Physical Metallurgy	ESS5520 高等物理冶金 (ESS5520) Advanced Physical Metallurgy
10	材料熱力學 Thermodynamics of Materials	固態熱力學 Thermodynamics of Solid State
11	固態物理導論 Introduction to Solid State Physics	ESS5390 / TIGP5509 固態物理一 (ESS5390/TIGP5509) Solid State Physics I
12	物理化學 Physical Chemistry	ESS5898 軟物質科學導論 或 TIGP5520 有機金屬化學 (2 選 1) (ESS5898) Introduction to Soft Condensed Matter or (TIGP5520) Organometallic Chemistry (Select one from two)
13	電化學原理 Principles of Electrochemistry	ESS5847 生化分析與實驗 (ESS5847) Bioanalytical Chemistry : Basic Principles and Lab Projects
14	近代物理 Modern Physics	ESS5620 中子與 X 光小角度散射 或 PHYS4670 同步加速器光源應用 (2 選 1) (ESS5620) Neutron and X-Ray Small Angle Scattering or (PHYS4670) Applications of Synchrotron Accelerator Light Source (Select one from two)
15	量子力學 Quantum Mechanism	ESS5822 分子動力學模擬 (ESS5822) Molecular Dynamics Simulations
16	電漿工程 Plasma Engineering	ESS5340 電漿工程應用 (ESS5340) Plasma Engineering and Applications
17	電磁學 Electromagnetics	ESS5271 微波工程 (ESS5271) Microwave Engineering
18	半導體元件物理 Semiconductor Devices Physics	ESS5230 半導體元件物理 (ESS5230) Semiconductor Devices Physics
19	電路學 Circuits Analysis	ESS5290 混合訊號積體電路設計 (ESS5290) Mixed-Signal Integrated Circuit Design
20	電子元件 Electronic Devices	微電子工程 Microelectronic Engineering
21	電子系統 Electronic Systems	