

# National Cheng Chung University

## Department of Electrical Engineering

### Ph.D. Program Requirements

Amended and approved by Department faculty meeting, October 31, 2005  
Amended and approved by Department faculty meeting, September 21, 2007  
Amended and approved by Department faculty meeting, April 11, 2008  
Amended and approved by Department faculty meeting, Jun 12, 2009  
Amended and approved by Department faculty meeting, October 30, 2009  
Amended and approved by Department faculty meeting, October 24, 2014  
Amended and approved by Department faculty meeting, November 28, 2014  
Amended and approved by Department faculty meeting, April 10, 2015  
Amended and approved by Department faculty meeting, June 12, 2015  
Amended and approved by Department faculty meeting, June 17, 2016  
Amended and approved by Department faculty meeting, June 16, 2017  
Amended and approved by Department faculty meeting, March 8, 2019  
Amended and approved by Department faculty meeting, November. 24, 2019  
Amended and approved by Department faculty meeting, December. 29, 2023  
Amended and approved by Department faculty meeting, August. 26, 2024

#### **I. & II. Advisor Regulation**

1. There are seven groups in Ph.D. program of Department of Electrical Engineering of CCU.
2. Graduate students can submit their advisor transference forms to the Graduate Affairs Committee in the end of the first academic year.
3. Advisor transference must be approved by the Graduate Affairs Committee and the Chair of the department.

#### **III. Credit Requirement**

1. Students must complete 18 credits. (Excluding Group Discussion, Seminar Lecture, Research Paper Writing, Engineering Ethics, and Patent Writing). Only 3 credits are allowed from Specialty Topics or Technical English Writing.
2. Students can take elective courses from other departments under the admission from advisor.
3. Students may take elective courses from other school with the approvals from adviser, the Graduate Affairs Committee and the Chair of the department. At most, six credits are allowed.
4. It must be completed 42 credits to graduate for Direct Admission into Ph.D. Students (Include master's program 24 credits at most).
5. If the first-year Ph.D. students who have received a master's degree for four years (inclusive) took courses with score of 85 (Master graduate students of Department of EE are required with score of 80) or above and the credits which didn't be counted toward their master graduate degree, you may apply to transfer the courses toward their PhD program credits before the end of the course selection period in the first semester. The maximum of credits transferred are 6 credits.

6. Students must receive an approval of 18 credits of graduation from the advisor and the Graduate Affairs Committee.

#### **IV. Ph.D. Candidate Requirement**

1. Students must submit the application of Ph.D. qualification examination in two weeks after the start of each semester. (As listed in attachment 2)
2. The "Application for PhD Qualification examination" details the joint mandatory subjects and the professional subjects of each group of optional examinations. Students are required to select two major subjects in the professional subjects that they belong to in their respective groups, and to take a joint compulsory examination subject.
3. Students must pass the common compulsory subjects (, can apply the examination up to three times in seven semesters,) or choose to be credited by way of section 5 after admission, and pass the major subjects within seven semesters, and the subjects passed in the previous time can be retained.
4. For students who do not pass the elective professional courses, they can get the credit of these courses by two alternatives. Students can substitute six points of research works above the level C or two elective academic courses for the exam passing of one elective professional course.
5. For students who do not pass the exam of common compulsory subjects and they have research works above level C, they can submit "application for credits waiver of common subject for PhD student" (as listed in attachment 3) before the eighth semester and choose one of the following four alternatives to substitute for the exam passing of one common subject.
  - a. Take 3 additional common courses.
  - b. Take 2 additional common courses and 2 points of research works.
  - c. Take 1 additional common course and 4 points of research works.
  - d. No additional common courses and 6 points of research works.

The common courses need to be the related courses of common compulsory subjects of PhD qualification exam or the appointed courses by advisor and then is approved by the Graduate Affairs Committee and chair. Students must complete the common courses and have a score above 70 before submitting the "Application for credits waiver of common subject for PhD student".

6. Students qualify for the Ph.D. candidate within a specified period. When students pass application, you will get the Ph.D. candidate. ("Application form for qualification examination of the PhD candidate", as listed in attachment 4)
7. The points for the research works and the credits of the additional course mentioned in item 4 and item 5 are not accounted in the Ph.D. degree examination calculated in item 8.
8. Students who fail to satisfy the regulations concerning the qualification exams in the end of the seventh semester and did not submit the application of Ph.D. candidate qualification in the eighth semester and application for common required subjects are not approved shall be required to withdraw from this

Department and Institute. Students, whose study plans were approved, shall be required to withdraw from this Department and Institute if they do not accomplish the study plans within two years. However, Direct Admission into Ph.D. Students may apply for conversion to Master's degree and, in accordance with the qualifications of the master's degrees examination, may submit a master's degree examination as required.

- V. The research credits were formulated by “The Research Credit Rule for Ph.D. student of Department of Electrical Engineering and Department of Communications Engineering”

## **VI. Degree Exam**

1. Students must complete course in academic ethics before the first semester and gain the proof of completion.
2. Students complete the prescribed credits and qualify for a PhD candidate after studying for four terms (inclusive), students must meet one of the following conditions. Moreover, Students submit the application form with the relevant certificate that the advisor signed and the certificate of academic ethics to Department of EE before the deadline for degree examination. A degree exam can be held after an application was approved.
3. The research credits should be more than 15 points.
4. There are four alternatives:
  - (a) A fully-counted research outcome in Level A :
  - (b) Two fully counted journal papers in Level B or one fully counted journal paper in Level B and one fully counted conference paper in Level B in the 7th semester and after.
  - (c) One fully counted journal paper in Level B and three fully counted conference paper in Level C in the 10th semester and after.
  - (d) In the 14th semester of study, it is necessary to have the results of Level C studies with a full point of B and three full points, or Level C research with five full points of account. (At least one of the research results of a journal paper for the first student author)

The research credits will not be double calculated and they must be approved from the advisor and the Graduate Affairs Committee. The total points for patent, soft/Hardware project awards is limited to a maximum of seven points.

- VII. According to the rule of CCU, students who fail the degree exam in the first time are allowed to take the exam again. A Ph.D. degree will be conferred after students pass the degree exam. If Direct Admission into Ph.D. Students do not pass the degree exam but meet the Master's standards, A Master degree is going to be conferred on you.

## **VIII. Duration of Study**

All students are required to complete the program within 2 to 7 years. Part-time students may extend this limit to 8 years. The identification for part-time students

depends on the status of the students when they enter the program.

**IX. The Ph.D. students who restudy for Department of Electrical Engineering or Department of Communications Engineering**

1. Students who did not change the group, may reserve the following:
  - (a) The Ph.D. candidate qualification
  - (b) The passing exam of qualification
  - (c) At most 3 course credits.
  - (d) The research outcome in the previous run and the semester count by the approval of the advisor.
2. Students who have changed the group, may reserve the following:
  - (a) The passing exam of qualification
  - (e) At most 3 course credits.

The research credits in the previous run will not be calculated for graduation.

**X. The degree requirements and guidelines for course selection herein shall be implemented after the passage of the committee of department of Electrical Engineering. Any subsequent amendments shall be submitted for review.**

附件一

## 電機工程學系博士生更換指導教授或組別申請書

Application form for changing advisor for PhD students

學生姓名 Student name	
年級 / 組別 Grade / Group	
學生學號 Student ID no.	
聯絡電話 Contact phone number	
申請理由* Reason	
原指導教授姓名 Original advisor	
更換後之指導教授簽章 New advisor	
研究所事務委員會審查意見* 及召集人簽章 Review comment from graduate students affairs committee and the convener's signature	
系主任簽章 Department chair's signature	

\* 若表格不敷使用，得另紙書寫

# 電機工程學系博士生更換指導教授或組別

Changing advisor or group for PhD students

## 原指導教授意見書

Comment from the original advisor

學生姓名 Student Name	
年級 / 組別 Grade / Group	
學生學號 Student ID no.	
聯絡電話 Contact phone number	
原指導教授姓名及意見 Original advisor's name and comment	

※本表格由研究所事務委員會加會原指導教授。

# 學年度第 學期電機系博士班資格考申請書

Application for the qualification examination for PhD student

Student Name : \_\_\_\_\_ Group : \_\_\_\_\_

說明事項：

- 學生須自所屬組別可選考之專業科目中選考兩科專業科目，並選考一科共同必考科目。  
Students must take two major courses and one common compulsory subject from the optional major subjects of own group.
- 學生須於入學後通過共同必考科目(七學期內至多報考三次)或選擇以第五款方式抵免，並於七學期內通過專業科目，其前次通過之科目得予保留。  
Students must pass the common compulsory subjects (, can apply the examination up to three times in seven semesters,) or choose to be credited by way of section 5 after admission, and pass the major subjects within seven semesters, and the subjects passed in the previous time can be retained.
- 共同必考科目為(下列二個單元選一個)：  
(1)第一單元：數學【含線性代數、微分方程、機率】【三選二】100分。  
(2)第二單元：電子學(必選)佔50分及電路學、電磁學【二選一】佔50分。  
Common subject exam: (Choosing one subject)  
(1) Mathematics : Linear Algebra (scores 50), Differential Equation (scores 50), and Probability (scores 50) (Choosing two from three)  
(2) Electronics (required, scores 50), Electrical Circuitry (scores 50) or Electromagnetism (scores 50) (Choosing one from two)
- 共同科目於本系網頁上有參考題庫，其中50%乃參考題庫之技術觀念而出，但可能另輔以題型等變化；另外50%則是自由出題。  
Sample tests for the Common exam subject are available on the department's web page. Over 50% of the test, questions might be chosen (or modified) from this sample set.
- 各組可選考之專業科目為 (Elective exam courses are) :

組 別 Group Name	考 試 科 目 Exam Course
Communication Systems	數位通訊 Digital Communications 隨機程序 Stochastic Processes
Communication and Networking	<del>排隊理論 Queueing Theory</del> 數位通訊 Digital Communications 電腦網路 Computer Network 網路最佳化 Network Optimization

Signal Processing and Multimedia Communication	語音處理 Speech Processing 醫學信號處理 Biomedical Signal Processing 影像處理 Image Processing 視訊處理 Video Processing <del>數位信號處理 Digital Signal Processing</del>
Computer Engineering	電腦視覺 Computer Vision 類神經網路與模糊系統 Neural Network and Fuzzy System 人工智慧 Artificial Intelligence 機器人學 Robotics
System on Chips	Digital SOC Design Mixed-Signal Design SOC Architecture SOC Design Methodology
Electromagnetic Integrated Circuits and Systems	高等電磁理論 Advanced Electromagnetic Theory 射頻與微波電路設計 RF and Microwave Circuit Design
Electric Power, Renewable Energy, and Power Electronics	高等電機理論 Advanced Electric Machine Theory) 電力電子學 Power Electronics 控制系統 Control Systems 高功率元件分析與設計 Analysis and Design of high power components
	再生能源與電力系統 Renewable Energy and Power System 電力系統運轉與控制 Power System Generation, Operation, and Control

※請於 年 月 日( )前申請，逾期不予受理。

**Deadline for Application:**

考試科目 Exam Course	科目組別 Group name	考試日期 Exam Date	備註 Notice

指導教授簽名 Advisor Signature : \_\_\_\_\_

申請日期 Date of Application : \_\_\_\_\_



# 博士班共同必考科目抵免申請書

Application for credits waiver of common subject for PhD student

(112.12.29 電機系與通訊系聯合系務會議修正通過)

Student Name : \_\_\_\_\_ Group : \_\_\_\_\_

說明：所修共同課程需在提出「博士班資格考共同必考科目抵免申請書」之前完成修課，且成績須達 70 分以上，才可抵免共同必考科目。

Students must complete the common courses and have a score above 70 before submitting the “Application for credits waiver of common subject for PhD student”.

三門共同課程或指導教授指定課程

Three common courses or the appointed course by advisor

二門共同課程或指導教授指定課程加兩點研究成果

Two common courses or the appointed course by advisor plus the 2 points of research results

一門共同課程或指導教授指定課程加四點研究成果

A common course or the appointed course by advisor plus the 4 points of research results

六點研究成果

6 points of research works.

如有指導教授指定課程，請列出課程資訊，若非本系課程，請附上課程大綱。

If you have the appointed courses by advisor, please list the information of these courses, if the courses do not belong to Department of EE, please attach the course syllabus.

課碼 Course Number	課程名稱 Course Name

備註：

1. 請附 C 級（含）以上之研究成果證明資料。

Please attach the information of the research results above level C (inclusive).

2. 共同課程(下列擇一單元內之課程來修課，不可跨單元)：

Common courses (choose the following modules for classes, not cross-unit)

(1) 第一單元：線性代數(課碼：4151011、4301001)、微分方程(課碼：4152018、4302004)、機率(課碼：4153011、4302015)

The first unit : Linear Algebra (4151011、4301001), Differential Equation (4152018、4302004), and Probability(4153011、4302015)

(2) 第二單元：電子學(一)(課碼：4152006、4302002)、電子學(二)(課碼：4152007、4302012)、電路學(一)(課碼：4152004、4302001)、電磁學(一)(課碼：4152008、4302014)

The second unit : Electronics I (4152006、4302002), Electronics II (4152007、4302012), Electrical Circuitry I (4152004、4302001) and Electromagnetism I (4152008、4302014)

指導教授簽名：\_\_\_\_\_ 日期：\_\_\_\_\_

Advisor Signature Date

研究所學業導師簽名：\_\_\_\_\_ 日期：\_\_\_\_\_

Academic Tutor Signature Date

系主任簽名：\_\_\_\_\_ 日期：\_\_\_\_\_

The director Signature Date

## 博士候選人資格審查申請表

Application for Qualification Review for PhD student

108.11.22 電機系與通訊系聯合系務會議修正通過

Student Name : \_\_\_\_\_

Student ID no. : \_\_\_\_\_

資格審定：博士班研究生依據「博士班修業規定」，於修滿規定學分，配合其通過之學科考試科目情形，須滿足下列條件之一，方得填妥申請表格，並備妥相關證明，經指導教授簽名後，向系辦公室提出博士候選人資格審定之申請。

In according to Ph.D. Program Requirements, Students complete the prescribed credits and pass the subject exams; you must meet at least the following one condition to submit the application with the relevant certificate that the advisor signed to Department of Electrical Engineering.

a. 通過共同必考科目 1 科 + 通過選考專業科目 2 科。

Pass a common subject exam and two elective subject exams

b. 通過共同必考科目 1 科或完成共同必考科目抵免 + 研究成果發表計點合計在 12 點（含）以上。

Pass a common subject exam or finish credits waiver of common subject plus the credits for the research results should be more than 12 points (inclusive).

c. 通過共同必考科目 1 科或完成共同必考科目抵免 + 通過選考專業科目 1 科 + 研究成果發表計點合計 6 點（含）以上。

Pass a common subject exam or finish credits waiver of common subject plus the credits for the research results should be more than 6 points (inclusive).

d. 通過共同必考科目 1 科或完成共同必考科目抵免 + 加修 4 專業科目。

Pass a common subject exam or finish credits waiver of common subject plus take four professional subject courses.

e. 通過共同必考科目 1 科或完成共同必考科目抵免 + 通過選考專業科目 1 科 + 加修 2 專業科目。

Pass a common subject exam or finish credits waiver of common subject plus pass an elective subject and take two professional subject courses.

f. 通過共同必考科目 1 科或完成共同必考科目抵免 + 通過選考專業科目 2 科。



## 博士班學生畢業資格審查表

Application for Graduation Qualification Review for PhD student

108.11.22 電機系與通訊系聯合系務會議修正通過

Student Name : \_\_\_\_\_

Student ID no. : \_\_\_\_\_

資格審定：

- 一、 學生於入學第一學期結束前，依據「國立中正大學研究生學術倫理教育實施要點」修習學術倫理教育課程，並取得修課證明。

According to the law of academic ethics education for postgraduate of CCU, students must complete course in academic ethics before the end of the first semester and gain the proof of completion.

- 二、 研究生於在學四學期（含）以上，修滿規定學分，並取得博士候選人資格後，須滿足下列條件之一，方得於學校規定之「研究生學位考試申請截止日」一週前填妥申請表格，並備妥相關資格證明，經指導教授簽名後，檢附學術倫理教育課程修課證明，向本系提出資格審定之申請。審定合格者得安排學位考試。

Students complete the prescribed credits and qualify for a PhD candidate after studying for four terms (inclusive), students must meet one of the following conditions. Moreover, Students submit the application form with the relevant certificate that the advisor signed and the certificate of academic ethics to Department of EE before the deadline for degree examination. A degree exam can be hold after an application was approved.

- a. 通過共同必考科目 **1** 科 + 通過選考專業科目 **2** 科 + 研究成果發表計點合計在 **15** 點（含）以上。

Pass a common subject exam, two elective professional subject exams and the credits for research results should be more than 15 points (inclusive).

- b. 通過共同必考科目 **1** 科或完成共同必考科目抵免 + 研究成果發表計點合計在 **27** 點（含）以上。

Pass a common subject exam or finish credits waiver of common subject plus the credits for the research results should be more than 27 points (inclusive).

- c. 通過共同必考科目 **1** 科或完成共同必考科目抵免 + 通過選考專業科目 **1** 科 + 研究成果發表計點合計 **21** 點（含）以上。

Pass a common subject exam or finish credits waiver of common subject pass one elective subject exam plus the credits for the research results should be more than 21 points (inclusive).

d. 通過共同必考科目 **1** 科或完成共同必考科目抵免 + 加修**4**專業科目 + 研究成果發表計點合計在 **15** 點 (含) 以上。

Pass a common subject exam or finish credits waiver of common subject plus take four professional subject courses plus the credits for the research results should be more than 15 points (inclusive).

e. 通過共同必考科目 **1** 科或完成共同必考科目抵免 + 通過選考專業科目 **1** 科 + 加修**2**專業科目 + 研究成果發表計點合計在 **15** 點 (含) 以上。

Pass a common subject exam or finish credits waiver of common subject plus pass an elective subject exam plus take two professional subject courses plus the credits for the research results should be more than 15 points (inclusive).

f. 通過共同必考科目 **1** 科或完成共同必考科目抵免 + 通過選考專業科目 **2** 科 + 研究成果發表計點合計在 **15** 點 (含) 以上。

Pass a common subject exam or finish credits waiver of common subject plus pass two elective subject exams plus the credits for the research results should be more than 15 points (inclusive).

備註：如有採用抵免共同必考科目，上述研究成果發表合計點數不包含共同必考科目抵免申請書內所需之研究成果點數。

If students substitute credits waiver for the common subject exam, the total points published in the research results will not include the points of credits waiver in the application for common required subjects.

本人適用條款：

I intend for the applicable terms

a 條款     b 條款     c 條款     d 條款     e 條款     f 條款

指導教授簽名：\_\_\_\_\_

日期：\_\_\_\_\_

Advisor Signature

Date

研究所學業導師簽名：\_\_\_\_\_

日期：\_\_\_\_\_

Academic Tutor Signature

Date

系主任簽名：\_\_\_\_\_

日期：\_\_\_\_\_

The director Signature

Date