

# National Cheng Chung University

## Department of Communications 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, Mars, 08, 2019  
Amended and approved by Department faculty meeting, Nov. 22, 2019  
Amended and approved by Department faculty meeting, Sep. 18, 2020  
Amended and approved by Department faculty meeting, March. 5, 2021

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

1. There are two groups (**Communication Systems** and **Communication and Networking**) in the Ph.D. program of Department of Communications Engineering of CCU.
2. Graduate students who wish to change advisor or group can submit a petition to the Graduate Affairs Committee in the end of the first academic year.
3. The application for the change advisor or group needs to be approved by the Graduate Affairs Committee and the Chair of department.

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

1. Students must complete at least 18 credits. (Excluding Group Discussion, Seminar Lecture, Research Paper Writing, Engineering Ethics, and Patent Writing). Maximum 3 credits are allowed from Specialty Topics.
2. Students can take elective courses from other departments with the approval from advisor.
3. Students may take elective courses of other school with the approval from his/her adviser, the Graduate Affairs Committee and the Chair of the department. Maximum 6 credits are allowed.
4. 42 credits must be completed for students of direct admission into the Ph.D. program (including the credits for the master's degree).
5. For the first-year Ph.D. students who received a master's degree less than four years (inclusive) and took courses with score 85 (Master graduate students of Department of EE need to get score 80) or above and the credits were not counted toward their master's degree, they may apply to transfer these credits toward their PhD program credits in the course selection period in the first

semester. The application for credit transfer with requested document must be approved by the advisor and the Graduate Affairs Committee. Maximum 6 credits are allowed.

6. 18 credits toward graduation must be approved by advisor and the Graduate Affairs Committee.

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

1. Students need to submit the application for 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 common required subjects and the elective professional subjects for each groups. Students have to select two professional subjects according to their group and select one subject from the common required subjects.
3. Students must pass common subjects for the writing exam or credits waiver by section 5 after admission into the Ph.D. program within seven semesters.
4. Students who fail an elective professional subject can be credited by two alternatives: six points of research achievement above Level C (inclusive) or two professional courses.
5. Students who fail the common required subject and had research achievement above Level C (inclusive) submit the application for credits waiver of common subject for PhD student (as listed in attachment 3) before the eighth semester and also choosing one from the following alternatives.
  - a. Take 1 common course and 6 points of research achievement.
  - b. Take 2 common courses and 3 points of research achievement.
  - c. Take 3 common courses.

The common courses need to be related to the common required subject for the qualification examination or be approved by advisor and the Graduate Affairs Committee and the director of the department. Students need to score 70 or above for the common course and accomplish the study plan within 2 years

6. Student who is qualified for the Ph.D. candidate within a specified period is granted a Ph.D. candidate after getting an approval (the application for Ph.D. candidate qualification should be filled and submitted, as listed in attachment 4)
7. The points of the research works and the credits of the additional course mentioned in item 4 and item 5 are not double counted toward the qualification of Ph.D. degree examination in rule VI.
8. Students who fail to satisfy the regulations concerning the qualification exams in the end of the 7th semester and did not submit the application for a Ph.D. candidate qualification in the 8th semester or their application for credits waiver of common subject are not approved shall be required to withdraw from this Department and Institute. Students, who 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 was 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. A Ph.D. student may apply for Ph.D. dissertation defense examination after he/she has accomplished the following tasks: complete course credits, is qualified to be a Ph.D. candidate, and submit the required application form with the signature of his/her advisor, the related documents and the certificate of completion on the academic ethics course one week before the deadline of the application for the degree examination.
3. The research credits should be more than 15 points (inclusive).
4. The credits are calculated with four alternatives:
  - (a) A fully-counted research achievement 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 for students in the 7<sup>th</sup> semester and after.
  - (c) One fully counted journal paper in Level B and three fully counted conference paper in Level C for students in the 10<sup>th</sup> semester and after.
  - (d) One fully counted research achievement in Level B and three fully counted research achievement in Level C, or 5 fully counted research achievement in Level C for students in the 14<sup>th</sup> semester. (At least, the student needs to be the first student author in one journal paper)

The research credits will not be double counted and they need to be approved by the advisor and the Graduate Affairs Committee. The total points for patent, soft/hardware awards is limited to a maximum of 7 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 the student with direct admission into Ph.D. program fails to pass the oral defense for Ph.D. degree, he/she may be conferred a master's degree if the student meets the requirements of a master's degree.

### **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) Maximum 3 course credits.
  - (d) The research achievement in the previous run and the counted semester by the approval of advisor.
2. Students who have changed the group, may reserve the following:
  - (a) The passing exam of qualification
  - (e) Maximum 3 course credits.

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

### **X. The regulation shall be applied after the approval of faculty meeting. Any subsequent amendments shall be submitted for review.**

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

\* 若表格不敷使用，得另紙書寫。

附件二

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

※本表格由研究所事務委員會加會原指導教授。

# 學年度第      學期通訊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：

1. 學生須於入學七學期內，資格考須通過學科考試三科，其中一科為共同必考外，另二科為選考。  
Within 7 semesters starting from the first semester of admission into the EE PhD program, students need to pass three subjects for the writing exam: one is from the common subject exam; the others are from the elective courses.

2. 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)

3. 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.

4. 各組可選考之專業科目為 (Elective exam courses are) :

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

|   |  |
|---|--|
| Signal Processing and Multimedia Communication          | 語音處理 Speech Processing<br>醫學信號處理 Biomedical Signal Processing<br>影像處理 Image Processing<br>數位信號處理 Digital Signal Processing                             |
| Computer Engineering                                    | 電腦視覺 Computer Vision<br>類神經網路與模糊系統 Neural Network and Fuzzy System<br>人工智慧 Artificial Intelligence<br>機器人學 Robotics                                    |
| System on Chips   | Digital SOC Design<br>Mixed-Signal Design<br>SOC Architecture<br>SOC Design Methodology  |
| Electromagnetic Integrated Circuits and Systems         | 高等電磁理論 Advanced Electromagnetic Theory<br>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)<br>電力電子學 Power Electronics<br>控制系統 Control Systems<br>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<br>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<br>Exam Course | 科目組別<br>Group name | 考試日期<br>Exam Date | 備註<br>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

108 年 11 月 22 日 電機系與通訊系聯合系務會議修正通過

Amended and approved by Department faculty meeting, Nov. 22, 2019

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

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三點研究成果

Two common courses or the appointed course by advisor plus the 3 points of research results

一門共同課程或指導教授指定課程加六點研究成果

A common course or the appointed course by advisor plus the 6 points of research results

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<br>Course Number | 課程名稱<br>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年11月22日電機系與通訊系聯合系務會議修正通過

Amended and approved by Department faculty meeting, Nov. 22, 2019

**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** 科或完成讀書計畫共同必考科目抵免 + 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。  
Pass a common subject exam or finish credits waiver of common subject plus pass two elective subjects.

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, the total points published in the research results will not include the points for credits waiver in the application for common required subjects.

本人擬申請適用條款 I intend for the applicable terms :

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

請列出加修專業科目之課程資訊。

Please fill in course name and course number to the following form.

| 課碼<br>Course Number | 課程名稱<br>Course Name |
|---------------------|---------------------|
|                     |                     |
|                     |                     |
|                     |                     |
|                     |                     |

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

## 博士班學生畢業資格審查表

### Application for Graduation Qualification Review for PhD student

108年11月22日電機系與通訊系聯合系務會議修正通過

Amended and approved by Department faculty meeting, Nov. 22, 2019

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**

