

Regulations Governing Doctoral Studies, Qualifying and Dissertation Related Exams

Dept. of Electrical Engineering (Program C), Yuan Ze University

Amended & Approved:
by the faculty at #105-02 meeting on Apr. 16, 2018
by the faculty at #106-06 meeting on May 15, 2018
by the course committee at #107-03 meeting on Mar. 21, 2019
by the faculty at #107-04 meeting on Apr. 15, 2019
by the faculty at #108-02 meeting on Aug. 28, 2019
by the course committee at #108-04 meeting on Mar. 18, 2020
by the faculty at #111-02 meeting on Sep. 06, 2022
Amended by the 7th Academic Affairs Meeting, Academic Year 2022, on May 31, 2023

I. Advisor

Doctoral students, during their first year of entry into the Program, are required to select their individual dissertational advisors from the full-time faculty of the Program, as well as the full-time faculty of the International Program in of the college of Electrical and Communication Engineering, with ranking of assistant professor and beyond. If necessary, an application for appointing one and only one co-advisor may be submitted prior to the end of the first year. The co-advisor must have Ph.D. degree or ranking of assistant professor and beyond. Once the advisor (and/or co-advisor) is/are selected, doctoral students are not allowed to change their advisors at will. In case there is a need of changing an advisor, the student, with the written consent of his/her original advisor, is allowed to submit an application to the Program for changing an advisor on a one-time basis.

II. Study requirements

1. Required subjects

A doctoral student must take 4 credit hours of required subjects.

2. Elective subjects

(1) A doctoral student must take a minimum of 18 credit hours of elective courses within the allowable study period, where 15 credit hours must be obtained from the courses offered by the department.

(2) Postgraduate students in master's program directly leading to the doctoral degree are required to complete a minimum of 30 credit hours within the allowable study period, inclusive of the elective courses in the first year of master's program. (The number of recognizable credit hours completed in master's program will be handled according to the University's regulation.)

(3) A foreign postgraduate students in master's program directly leading to the doctoral degree is required to complete a minimum of 34 credit hours, where 15 credit hours must be obtained from the courses offered by the department, within the allowable study period, inclusive of the elective courses in the first year of master's program. (applicable to those who entered the program in or before Fall 2022) (The number of recognizable credit hours completed in master's program will be handled according to the University's regulation.)

3. Cross-system courses:

The students, who wish to take the courses offered in the special program for the part-time master's students, will not receive the credit hours unless the application form for cross-system courses is filed.

4. Academic research ethics education course:

The students, who enter the program, should complete the academic research ethics education course by the end of the first semester, according to the University's guidance of the academic research ethics education. In case it is missed, the degree's oral exam cannot proceed until the make-up course is taken.

III. Qualifying exam

1. Exam period

Qualifying exam will be held once each semester if there is a demand. (in principle, in February and October respectively). Doctoral students must take the qualifying exam within three years of their entry into the program. Within the three years, doctoral students can take the exam as many times as possible. (If failing the qualifying exam, the students may follow the provisions of Article 5 stated herein.)

2. Exam method

The exam is on the basis of a written form. The exam subjects for each exam can be chosen within the limit of those being not passed.

3. Exam subject

Choose 2 subjects from the list, according to the student's research field in Electrical Engineering. Please see Appendix I for the list.

4. Exam passing standard

The total score for each subject is 100 points, and the passing standard is to attain 70 points or higher. Those subjects being passed are exempted from being re-tested.

5. Provision of failing the exam

Those who failed in the qualifying exam after three years will be recommended to publish additional academic papers in recognized journals instead prior to obtaining their doctoral degree, one subject fail for additional 1.0 point for paper publication requirement and two subject fails for additional 2.0 point. For paper ranking and point counting, please follow the same provisions stated in Item V, Standards of doctoral publications.

6. Alternative provision of failing the exam

Those who cannot fulfill the qualifying exam requirements may choose to use the satisfactory grades of the corresponding courses to waive the exam, with the consent of his/her advisor. Please

submit the waiver form accordingly. Note that the standard of passing grades is stated in the waiver form.

IV. Dissertational exam

1. Exam format:

The dissertational exam is on the basis of oral defense. The oral defense will be conducted by the dissertational exam committee according to the provisions of the Ministry of Education.

2. Establishment:

With the approval of the advisors, the students should apply to establish the exam according to the University's schedule and regulation.

3. Topical check:

A two-page draft of the dissertation should be submitted to the committee of Admission and Student Affairs, when the student applies to establish the exam. The committee will perform the topical check. The student will have one month to revise the draft and get it re-checked, if it is rejected by the committee.

4. Originality assessment:

The student should complete the process of thesis/dissertation plagiarism detection for originality assessment prior to the degree's oral exam, and the level of total similarity is required to be less than 30%. In addition, the form entitled "Thesis Originality Assessment Checklist" along with the full report from the detection system (excluding his/her own published papers, the table of contents, the abstract, and the references therein) should be reviewed by his/her advisor(s), and be handed in to all exam committee members for reference at the exam day. Regarding the report from the detection system, the percentage of similarity with a single source should not exceed 5%, excluding his/her own published papers. Please mark his/her own published papers in the reference list in the report. The software Turnitin is recommended as the detection system.

V. Standards of doctoral publications

Before obtaining a doctoral degree, doctoral students are required to meet the following publication requirements, in addition to completion of dissertation.

The student has to obtain at least 2.0 points for academic papers coauthored with the advisor published under the name of Yuan Ze University in the journals belonging to Scientific Citation Index (SCI). Of the published and counted papers, there should be at least one publication with the status of the first author (counted after excluding the advisor and co-advisor). The points for the published papers will be given according to the statement below:

It is given according to the student's ranking status in the author list of each publication, counted after excluding the advisor and co-advisor. It will be respectively deemed 1.0, 0.8, 0.5,

0.3 points for the student status of the first, the second, the third and the fourth author; it will be deemed 0.1 points for the student status of the fifth author or after.

The content of the published papers must be derived from the dissertation. Also, the submission dates of the papers have to coincide with the time when the student stays in the program.

The papers can be deemed when they get published; alternatively, they can be deemed as long as the documentations of acceptance are shown.

The ranking and classification of the journals are handled according to the norm enacted by the Program.

The standards stated herein are the necessary conditions to obtain a doctoral degree. To hold an oral defense, the student must submit the request on the advisor's recommendation and receive the approval of the Program Faculty Meeting.

VI. Questions and Disputes

For those doctoral students having problems about the graduation requirements, please consult with the Program Office as early as possible. In case of any dispute over graduation requirements, it will be settled through the Program Faculty Meeting.

In the course of dissertation, the students cannot change their advisors at will. In case there is a need of changing an advisor, the student is required to submit "Request to change the advisor" and "Agreement for changing the advisor" forms to the Program for approval. In case of any dispute over the change of the advisor, it will be settled through the Program Faculty Meeting.

VII. Enaction and Amendment

The regulations herein will come into effect after approval by the Program Faculty Meeting, and by the various committee of the respective upper ranks and the University. Amendment to the regulations shall follow the same procedure.

**Course Listings for Foreign students studying Doctoral Program
Electrical Engineering (Program C), YZU**

Course Code	Course Title	Credits
EEC601	Research Communication(I)	1
EEC602	Research Communication(II)	1
EEC535	Electro-Optical Lab	3
EEC502	Seminar	1
EEC503	Semiconductor Physics	3
EEC504	Design of Fiber Systems	3
EEC505	GEECmetrical Optics	3
EEC508	Photonic Crystals	3
EEC509	Solid-State Physics	3
EEC511	Optical Design	3
EEC512	Optical Disc Technology	3
EEC513	Electromagnetic Optics	3
EEC514	Fourier Optics	3
EEC518	Opto-Electronic Technology	3
EEC519	Optics of Liquid Crystal Displays	3
EEC521	Numerical Analysis	3
EEC523	Image Inspection and Detection Technique	3
EEC524	Optical Communication	3
EEC526	Thin Film optics	3
EEC527	Diffraction optics	3
EEC528	Coding Alchemy:Structure and Algorithms For Simulation	3
EEC529	Micro and Nano Electro-Mechanical System, MEMS & NEMS	3
EEC530	Opto-Electronics	3
EEC531	Semiconductor Devices	3
EEC532	Principle of Liquid Crystal Displays	3
EEC534	Principles of Lasers and Applications	3
EEC537	Methodologies in Organic Electronics	2
EEC538	Micro-electro-mechanical system	3
EEC539	Holography and holographic Interferometry	3
EEC540	Principles and Applications of Light Emitting Diodes	3
EEC541	Photovoltaic Devices	3
EEC542	Introduction to Semiconductor Manufacturing Technology	3
EEC543	Organic light-emitting devices and physics	3
EEC544	Optical Simulation	3
EEC545	Computational Optics	3
EEC546	An Introduction to Silicon Photonics	3
EEC547	Optomechanical Design	3
EEC548	An Introduction to Optical Lithography	3
EEC549	Introduction of the advanced optoelectronic devices	3
EEC550	Nonlinear Dynamics of Semiconductor Lasers	3
EEC551	Thin-film Technology	3
EEC561	Machine Learning and Its Applications	3
EEC562	Quantum Mechanics	3
EEC563	Artificial Intelligence and its applications	3
EEC564	Electrooptical Integrated Circuits	3
EEC573	Lighting and Vision	3

List of the subjects of qualifying exams and their reference texts

Subjects	Reference Texts	Scope
Semiconductor Physics and Devices	1) B. G. Streetman and S. Banerjee, <i>Solid State Electronic Devices</i> , Prentice Hall. 2) D. A. Neamen, <i>Semiconductor Physics and Devices: Basic principles</i> , McGraw-Hill.	
Geometrical Optics	1) Geometrical Optics, 2) E.Hecht, <i>Optics</i> , Addison Wesley.	Ch 4~6
Fourier Optics	1) J. W. Goodman, <i>Introduction to Fourier Optics</i> , Roberts & Co. 2) J. D. Gaskill, <i>Linear Systems, Fourier Transforms, and Optics</i> , Wiley.	(1) Harmonic analysis, Operators and physical systems, Convolution, Fourier transform (2) Foundations of scalar diffraction theory, Fresnel and Fraunhofer diffraction (3) Fourier transforming and imaging properties of lenses
Electromagnetic Optics	1) B. E. A. Saleh and M. C. Teich, <i>Fundamentals of Photonics</i> , Wiley. 2) A. Yariv and P. Yeh, <i>Optical Waves in crystals</i> , Wiley.	(1) Paraxial Helmholtz equation, Complex amplitude, Eikonal equation, Gaussian beam (2) Dielectric media, Absorption, Dispersion, Fresnel's equations (3) Crystal optics, optical activity, polarization devices
Opto-Electronics	Yariv and Yeh, <i>Photonics</i> , 2006.	
Fiber Optic Communication	Agrawal, <i>Fiber Optic Communication</i> , 3rd Ed., 2003.	
Photovoltaic Devices	M. A. Green, <i>Solar Cells: Operating Principles, Technology, and System Applications</i> , Prentice-Hall.	The basic operating principles of photovoltaics (PV); basic physics of semiconductor and P-N junction; solar radiation; design and optimization of PV devices; crystalline Si solar cells; thin film solar cells..
Thin Film Optics	H. A. Macleod, <i>Thin-film Optical Filters</i> , 3rd Ed., CRC Press.	Maxwell's equations, optical admittance, admittance track plot method, structure design for reduction of reflection, L/4-L/4 film system design, L/4-L/2 film system design, Catlan method, Schuster plots, Schuster plot of L/4-L/4 system, vacuum system for coating optical thin film
Organic Light-emitting Devices and Physics	Joseph Shinar, <i>Organic Light-Emitting Devices</i> , Springer.	
Principle of Liquid Crystal Displays	Jiun-Haw Lee, <i>Introduction to Flat Panel Displays</i> , Wiley.	
Optics of Liquid Crystal Displays	Pochi Yeh and Claire Gu, <i>Optics of Liquid Crystal Displays</i> , Wiley.	
Coding Alchemy: Structure and Algorithms for Simulation	Ian Chai and Jonathan David White, <i>Structuring Data and Building Algorithms</i> , McGraw-Hill.	
Photonic Crystals	John D. Joannopoulos, <i>Photonic Crystals-Modeling the Flow of Light</i> , Princeton Press.	
Image Inspection and Detection Technique	Rafael C.Gonzalez , <i>Digital Image processing using MATLAB</i> , McGraw-Hill.	
Diffraction Optics	Keigo Lizuka, <i>Elements of Photonics</i> , Wiley.	
Laser Principles and Applications	Joseph T. Verdeyen, <i>Laser Electronics</i> , 3rd Ed., Prentice Hall.	
Optical Design	Warren J. Smith, <i>Modern Lens Design</i> , 2nd Ed., McGraw-Hill.	

元智大學電機工程學系(丙組)博士班資格考選課替代抵免表

Waiver Form of Ph.D. Qualification Exam

Dept. of Electrical Engineering (Program C), Yuan Ze University

105.11.03 105-02 系務會議修訂通過

107.05.15 106-06 系務會議修訂通過

申請人姓名 Student's Name		申請日期 Date	
學號 Student I.D. Number		聯絡電話 Phone number	

申請抵免科目 Course list to waive the qualifying exams :

科目 Course	學期成績 Grade	抵免博士班資格考選考科目 Ph.D. qualifying exam subjects to be waived

申請人簽名

指導教授簽名

Applicant Signature _____ Advisor Signature _____

備註 Note :

- 1、申請時間：學期成績公告後一週內申請，須附學期成績單。
Applicant must submit this form along with her/his transcript within 7 days after the score of a corresponding course is announced.
- 2、抵免用科目學科成績須達 85 分以上始准予申請抵免。
The minimum score for waiving the qualification exam of a subject is 85 points.
- 3、舊生可溯及既往，若以選課替代，課程自 971 學期開始採計，962 學期以前的成績紀錄不予採計。
The above rules are only applicable to the courses offered since the school year of 2008.